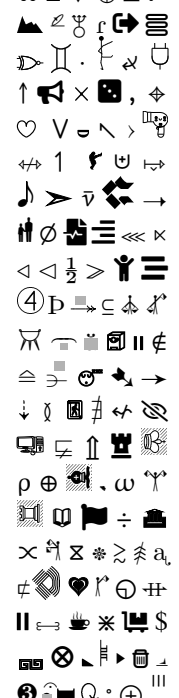
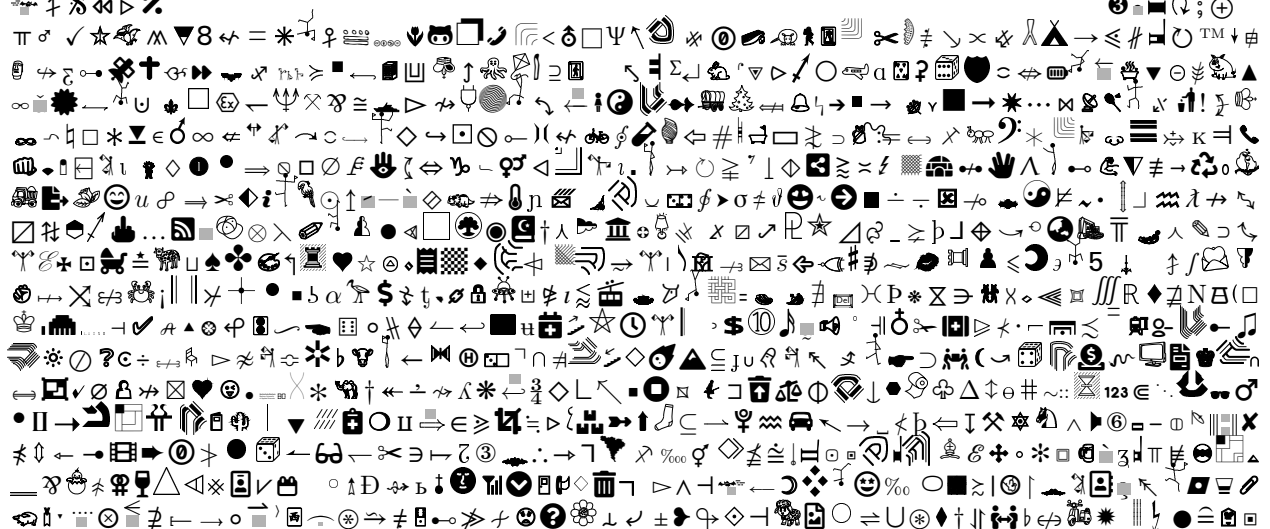


# The Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List

Scott Pakin, [scott-ctan@pakin.org](mailto:scott-ctan@pakin.org)

3 January 2024



### **Abstract**

This document lists 20323 symbols and the corresponding  $\text{\LaTeX}$  commands that produce them. Some of these symbols are guaranteed to be available in every  $\text{\LaTeX} 2_{\epsilon}$  system; others require fonts and packages that may not accompany a given distribution and that therefore need to be installed. All of the fonts and packages used to prepare this document—as well as this document itself—are freely available from the Comprehensive  $\text{\TeX}$  Archive Network (<https://www.ctan.org/>).

# Contents

<b>Contents</b>	<b>1</b>
<b>1 Introduction</b>	<b>16</b>
1.1 Document Usage . . . . .	16
1.2 Frequently Requested Symbols . . . . .	17
<b>2 Body-text symbols</b>	<b>18</b>
Table 1: L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub> Escapable “Special” Characters . . . . .	18
Table 2: Predefined L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub> Text-mode Commands . . . . .	19
Table 3: L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub> Commands Defined to Work in Both Math and Text Mode . . . . .	19
Table 4: $\mathcal{A}\mathcal{M}\mathcal{S}$ Commands Defined to Work in Both Math and Text Mode . . . . .	20
Table 5: Non-ASCII Letters (Excluding Accented Letters) . . . . .	20
Table 6: textgreek Upright Greek Letters . . . . .	20
Table 7: Letters Used to Typeset African Languages . . . . .	21
Table 8: Letters Used to Typeset Vietnamese . . . . .	21
Table 9: Punctuation Marks Not Found in OT1 . . . . .	21
Table 10: pifont Decorative Punctuation Marks . . . . .	21
Table 11: fontawesome5 Decorative Punctuation Marks and Typographic Symbols . . . . .	22
Table 12: tipa Phonetic Symbols . . . . .	22
Table 13: tipx Phonetic Symbols . . . . .	23
Table 14: wsuipa Phonetic Symbols . . . . .	24
Table 15: wasysym Phonetic Symbols . . . . .	25
Table 16: phonetic Phonetic Symbols . . . . .	25
Table 17: t4phonet Phonetic Symbols . . . . .	25
Table 18: semtrans Transliteration Symbols . . . . .	25
Table 19: Text-mode Accents . . . . .	26
Table 20: tipa Text-mode Accents . . . . .	26
Table 21: extraipa Text-mode Accents . . . . .	28
Table 22: wsuipa Text-mode Accents . . . . .	28
Table 23: phonetic Text-mode Accents . . . . .	29
Table 24: metre Text-mode Accents . . . . .	29
Table 25: t4phonet Text-mode Accents . . . . .	29
Table 26: arcs Text-mode Accents . . . . .	30
Table 27: semtrans Accents . . . . .	30
Table 28: ogonek Accents . . . . .	30
Table 29: combelow Accents . . . . .	30
Table 30: wsuipa Diacritics . . . . .	31
Table 31: textcomp Diacritics . . . . .	31
Table 32: marvosym Diacritics . . . . .	31
Table 33: textcomp Currency Symbols . . . . .	31

Table 34:	marvosym Currency Symbols . . . . .	32
Table 35:	fontawesome5 Currency Symbols . . . . .	32
Table 36:	wasysym Currency Symbols . . . . .	32
Table 37:	G <sup>h</sup> A2e Currency Symbols . . . . .	32
Table 38:	teubner Currency Symbols . . . . .	32
Table 39:	tfruee Currency Symbols . . . . .	32
Table 40:	eurosym Euro Signs . . . . .	33
Table 41:	fourier Euro Signs . . . . .	33
Table 42:	textcomp Legal Symbols . . . . .	33
Table 43:	fontawesome5 Legal Symbols . . . . .	33
Table 44:	cclicenses Creative Commons License Icons . . . . .	34
Table 45:	ccicons Creative Commons License Icons . . . . .	34
Table 46:	textcomp Old-style Numerals . . . . .	34
Table 47:	Miscellaneous textcomp Symbols . . . . .	34
Table 48:	Miscellaneous wasysym Text-mode Symbols . . . . .	35
<b>3</b>	<b>Mathematical symbols</b>	<b>36</b>
Table 49:	Math-mode Versions of Text Symbols . . . . .	36
Table 50:	logix Math-mode Versions of Text Symbols . . . . .	37
Table 51:	logix Basic Operators . . . . .	37
Table 52:	cmll Unary Operators . . . . .	37
Table 53:	Binary Operators . . . . .	37
Table 54:	$\mathcal{AMS}$ Binary Operators . . . . .	38
Table 55:	stmaryrd Binary Operators . . . . .	38
Table 56:	wasysym Binary Operators . . . . .	38
Table 57:	txfonts/pxfonts Binary Operators . . . . .	39
Table 58:	mathabx Binary Operators . . . . .	39
Table 59:	MnSymbol Binary Operators . . . . .	39
Table 60:	fdsymbol Binary Operators . . . . .	40
Table 61:	boisik Binary Operators . . . . .	41
Table 62:	stix Binary Operators . . . . .	42
Table 63:	mathdesign Binary Operators . . . . .	43
Table 64:	pdfMSym Binary Operators . . . . .	43
Table 65:	cmll Binary Operators . . . . .	44
Table 66:	shuffle Binary Operators . . . . .	44
Table 67:	resmes Binary Operators . . . . .	44
Table 68:	logix Logical Operators . . . . .	44
Table 69:	ulsy Geometric Binary Operators . . . . .	44
Table 70:	mathabx Geometric Binary Operators . . . . .	45
Table 71:	MnSymbol Geometric Binary Operators . . . . .	45
Table 72:	fdsymbol Geometric Binary Operators . . . . .	46
Table 73:	boisik Geometric Binary Operators . . . . .	47
Table 74:	stix Geometric Binary Operators . . . . .	47
Table 75:	logix Geometric Binary Operators . . . . .	48
Table 76:	halloweenmath Halloween-Themed Math Operators . . . . .	52
Table 77:	stix Small Integrals . . . . .	53
Table 78:	stix Small Integrals with Explicit Slant . . . . .	53
Table 79:	Variable-sized Math Operators . . . . .	54
Table 80:	$\mathcal{AMS}$ Variable-sized Math Operators . . . . .	54
Table 81:	stmaryrd Variable-sized Math Operators . . . . .	54
Table 82:	wasysym Variable-sized Math Operators . . . . .	55

Table 83: mathabx Variable-sized Math Operators . . . . .	55
Table 84: txfonts/pxfonts Variable-sized Math Operators . . . . .	56
Table 85: esint Variable-sized Math Operators . . . . .	57
Table 86: bigints Variable-sized Math Operators . . . . .	58
Table 87: MnSymbol Variable-sized Math Operators . . . . .	58
Table 88: fdsymbol Variable-sized Math Operators . . . . .	59
Table 89: boisk Variable-sized Math Operators . . . . .	60
Table 90: stix Variable-sized Math Operators . . . . .	61
Table 91: stix Integrals with Explicit Slant . . . . .	62
Table 92: cmupint Variable-sized Upright Integrals . . . . .	64
Table 93: mathdesign Variable-sized Math Operators . . . . .	65
Table 94: pdfMsym Variable-sized Math Operators . . . . .	66
Table 95: prodint Variable-sized Math Operators . . . . .	66
Table 96: pdfMsym Extensible Math Operators . . . . .	67
Table 97: cml Large Math Operators . . . . .	67
Table 98: Binary Relations . . . . .	67
Table 99: $\mathcal{AMS}$ Binary Relations . . . . .	68
Table 100: $\mathcal{AMS}$ Negated Binary Relations . . . . .	68
Table 101: stmaryrd Binary Relations . . . . .	68
Table 102: wasysym Binary Relations . . . . .	68
Table 103: txfonts/pxfonts Binary Relations . . . . .	69
Table 104: txfonts/pxfonts Negated Binary Relations . . . . .	69
Table 105: mathabx Binary Relations . . . . .	69
Table 106: mathabx Negated Binary Relations . . . . .	70
Table 107: MnSymbol Binary Relations . . . . .	70
Table 108: MnSymbol Negated Binary Relations . . . . .	72
Table 109: fdsymbol Binary Relations . . . . .	73
Table 110: fdsymbol Negated Binary Relations . . . . .	74
Table 111: boisk Binary Relations . . . . .	76
Table 112: boisk Negated Binary Relations . . . . .	76
Table 113: stix Binary Relations . . . . .	77
Table 114: stix Negated Binary Relations . . . . .	78
Table 115: mathtools Binary Relations . . . . .	79
Table 116: turnstile Binary Relations . . . . .	79
Table 117: trsym Binary Relations . . . . .	80
Table 118: trfsigns Binary Relations . . . . .	80
Table 119: pdfMsym Binary Relations . . . . .	81
Table 120: cml Binary Relations . . . . .	81
Table 121: colonequals Binary Relations . . . . .	81
Table 122: fourier Binary Relations . . . . .	81
Table 123: logix Binary Relations . . . . .	81
Table 124: logix Set Symbols . . . . .	82
Table 125: Subset and Superset Relations . . . . .	82
Table 126: $\mathcal{AMS}$ Subset and Superset Relations . . . . .	82
Table 127: stmaryrd Subset and Superset Relations . . . . .	82
Table 128: wasysym Subset and Superset Relations . . . . .	82
Table 129: txfonts/pxfonts Subset and Superset Relations . . . . .	82
Table 130: mathabx Subset and Superset Relations . . . . .	83
Table 131: MnSymbol Subset and Superset Relations . . . . .	83
Table 132: fdsymbol Subset and Superset Relations . . . . .	84
Table 133: boisk Subset and Superset Relations . . . . .	84

Table 134: stix Subset and Superset Relations . . . . .	84
Table 135: logix Subset and Superset Relations . . . . .	85
Table 136: Inequalities . . . . .	85
Table 137: $\mathcal{AMS}$ Inequalities . . . . .	85
Table 138: wasysym Inequalities . . . . .	86
Table 139: txfonts/pxfonts Inequalities . . . . .	86
Table 140: mathabx Inequalities . . . . .	86
Table 141: MnSymbol Inequalities . . . . .	87
Table 142: fdsymbol Inequalities . . . . .	88
Table 143: boisk Inequalities . . . . .	89
Table 144: stix Inequalities . . . . .	89
Table 145: logix Inequalities and Equalities . . . . .	91
Table 146: $\mathcal{AMS}$ Triangle Relations . . . . .	91
Table 147: stmaryrd Triangle Relations . . . . .	91
Table 148: mathabx Triangle Relations . . . . .	91
Table 149: MnSymbol Triangle Relations . . . . .	92
Table 150: fdsymbol Triangle Relations . . . . .	93
Table 151: boisk Triangle Relations . . . . .	93
Table 152: stix Triangle Relations . . . . .	93
Table 153: Arrows . . . . .	94
Table 154: Harpoons . . . . .	94
Table 155: textcomp Text-mode Arrows . . . . .	94
Table 156: $\mathcal{AMS}$ Arrows . . . . .	94
Table 157: $\mathcal{AMS}$ Negated Arrows . . . . .	94
Table 158: $\mathcal{AMS}$ Harpoons . . . . .	95
Table 159: stmaryrd Arrows . . . . .	95
Table 160: txfonts/pxfonts Arrows . . . . .	95
Table 161: mathabx Arrows . . . . .	95
Table 162: mathabx Negated Arrows . . . . .	96
Table 163: mathabx Harpoons . . . . .	96
Table 164: MnSymbol Arrows . . . . .	96
Table 165: MnSymbol Negated Arrows . . . . .	98
Table 166: MnSymbol Harpoons . . . . .	99
Table 167: MnSymbol Negated Harpoons . . . . .	100
Table 168: fdsymbol Arrows . . . . .	100
Table 169: fdsymbol Negated Arrows . . . . .	102
Table 170: fdsymbol Harpoons . . . . .	104
Table 171: fdsymbol Negated Harpoons . . . . .	105
Table 172: boisk Arrows . . . . .	105
Table 173: boisk Negated Arrows . . . . .	106
Table 174: boisk Harpoons . . . . .	107
Table 175: stix Arrows . . . . .	107
Table 176: stix Negated Arrows . . . . .	109
Table 177: stix Harpoons . . . . .	110
Table 178: pdfMsym Arrows . . . . .	110
Table 179: pdfMsym Harpoons . . . . .	111
Table 180: chemarrow Arrows . . . . .	111
Table 181: fge Arrows . . . . .	111
Table 182: old-arrows Arrows . . . . .	112
Table 183: old-arrows Harpoons . . . . .	112
Table 184: logix Arrows . . . . .	113

Table 185: logix Negated Arrows . . . . .	114
Table 186: logix Harpoons . . . . .	114
Table 187: logix Implications and Equivalences . . . . .	114
Table 188: logix Negated Implications and Equivalences . . . . .	115
Table 189: esrelation Restrictions . . . . .	115
Table 190: MnSymbol Spoons . . . . .	115
Table 191: MnSymbol Pitchforks . . . . .	116
Table 192: MnSymbol Smiles and Frowns . . . . .	116
Table 193: fdsymbol Spoons . . . . .	117
Table 194: fdsymbol Pitchforks . . . . .	117
Table 195: fdsymbol Smiles and Frowns . . . . .	117
Table 196: halloweenmath Brooms and Pitchforks . . . . .	117
Table 197: ulsy Contradiction Symbols . . . . .	118
Table 198: Extension Characters . . . . .	118
Table 199: stmaryrd Extension Characters . . . . .	118
Table 200: txfonts/pxfonts Extension Characters . . . . .	118
Table 201: mathabx Extension Characters . . . . .	118
Table 202: stix Extension Characters . . . . .	118
Table 203: Log-like Symbols . . . . .	118
Table 204: $\mathcal{AMS}$ Log-like Symbols . . . . .	119
Table 205: mismath Log-like Symbols . . . . .	119
Table 206: mismath Asymptotic Notation . . . . .	119
Table 207: $\mathbb{A}2e$ Number Sets . . . . .	119
Table 208: Greek Letters . . . . .	120
Table 209: $\mathcal{AMS}$ Greek Letters . . . . .	120
Table 210: txfonts/pxfonts Upright Greek Letters . . . . .	121
Table 211: upgreek Upright Greek Letters . . . . .	121
Table 212: fourier Variant Greek Letters . . . . .	122
Table 213: txfonts/pxfonts Variant Latin Letters . . . . .	122
Table 214: boisk Variant Greek Letters . . . . .	122
Table 215: boisk Variant Latin Letters . . . . .	122
Table 216: stix Variant Greek Letters . . . . .	122
Table 217: stix Transformed Greek Letters . . . . .	122
Table 218: $\mathcal{AMS}$ Hebrew Letters . . . . .	122
Table 219: MnSymbol Hebrew Letters . . . . .	122
Table 220: fdsymbol Hebrew Letters . . . . .	123
Table 221: boisk Hebrew Letters . . . . .	123
Table 222: stix Hebrew Letters . . . . .	123
Table 223: Letter-like Symbols . . . . .	123
Table 224: $\mathcal{AMS}$ Letter-like Symbols . . . . .	123
Table 225: txfonts/pxfonts Letter-like Symbols . . . . .	123
Table 226: mathabx Letter-like Symbols . . . . .	123
Table 227: MnSymbol Letter-like Symbols . . . . .	124
Table 228: fdsymbol Letter-like Symbols . . . . .	124
Table 229: boisk Letter-like Symbols . . . . .	124
Table 230: stix Letter-like Symbols . . . . .	124
Table 231: trfsigns Letter-like Symbols . . . . .	124
Table 232: mathdesign Letter-like Symbols . . . . .	125
Table 233: fge Letter-like Symbols . . . . .	125
Table 234: fourier Letter-like Symbols . . . . .	125
Table 235: cmlt Letter-like Symbols . . . . .	125

Table 236: logix Proof Symbols . . . . .	125
Table 237: endofproofwd End-of-Proof Symbols . . . . .	126
Table 238: $\mathcal{AMS}$ Delimiters . . . . .	126
Table 239: stmaryrd Delimiters . . . . .	126
Table 240: mathabx Delimiters . . . . .	126
Table 241: boisik Delimiters . . . . .	126
Table 242: stix Delimiters . . . . .	126
Table 243: nath Delimiters . . . . .	127
Table 244: Variable-sized Delimiters . . . . .	127
Table 245: Large, Variable-sized Delimiters . . . . .	127
Table 246: $\mathcal{AMS}$ Variable-sized Delimiters . . . . .	128
Table 247: stmaryrd Variable-sized Delimiters . . . . .	128
Table 248: mathabx Variable-sized Delimiters . . . . .	128
Table 249: MnSymbol Variable-sized Delimiters . . . . .	128
Table 250: fdsymbol Variable-sized Delimiters . . . . .	130
Table 251: stix Variable-sized Delimiters . . . . .	131
Table 252: mathdesign Variable-sized Delimiters . . . . .	132
Table 253: nath Variable-sized Delimiters (Double) . . . . .	133
Table 254: nath Variable-sized Delimiters (Triple) . . . . .	133
Table 255: fourier Variable-sized Delimiters . . . . .	133
Table 256: logix Variable-sized Delimiters . . . . .	134
Table 257: textcomp Text-mode Delimiters . . . . .	135
Table 258: metre Text-mode Delimiters . . . . .	135
Table 259: Math-mode Accents . . . . .	136
Table 260: $\mathcal{AMS}$ Math-mode Accents . . . . .	136
Table 261: MnSymbol Math-mode Accents . . . . .	136
Table 262: fdsymbol Math-mode Accents . . . . .	137
Table 263: boisik Math-mode Accents . . . . .	137
Table 264: stix Math-mode Accents . . . . .	137
Table 265: fge Math-mode Accents . . . . .	137
Table 266: yhmath Math-mode Accents . . . . .	137
Table 267: pdfMSym Math-mode Accents . . . . .	138
Table 268: halloweenmath Halloween-Themed Math-mode Accents . . . . .	138
Table 269: realhats Math-mode Hat Accents . . . . .	138
Table 270: Extensible Accents . . . . .	139
Table 271: overrightarrow Extensible Accents . . . . .	139
Table 272: yhmath Extensible Accents . . . . .	139
Table 273: $\mathcal{AMS}$ Extensible Accents . . . . .	140
Table 274: MnSymbol Extensible Accents . . . . .	140
Table 275: fdsymbol Extensible Accents . . . . .	140
Table 276: stix Extensible Accents . . . . .	141
Table 277: mathtools Extensible Accents . . . . .	141
Table 278: mathabx Extensible Accents . . . . .	141
Table 279: fourier Extensible Accents . . . . .	142
Table 280: esvect Extensible Accents . . . . .	142
Table 281: pdfMSym Extensible Accents . . . . .	143
Table 282: overarrows Extensible Accents . . . . .	144
Table 283: abracas Extensible Accents . . . . .	144
Table 284: undertilde Extensible Accents . . . . .	144
Table 285: ushort Extensible Accents . . . . .	145
Table 286: mdwmath Extensible Accents . . . . .	145



Table 287: actuarialangle Extensible Accents . . . . .	145
Table 288: $\mathcal{AMS}$ Extensible Arrows . . . . .	145
Table 289: mathtools Extensible Arrows . . . . .	145
Table 290: chemarr Extensible Arrows . . . . .	146
Table 291: chemarrow Extensible Arrows . . . . .	146
Table 292: extarrows Extensible Arrows . . . . .	146
Table 293: pdfMSym Extensible Arrows . . . . .	147
Table 294: extpfeil Extensible Arrows . . . . .	147
Table 295: DotArrow Extensible Arrows . . . . .	147
Table 296: halloweenmath Extensible Arrows . . . . .	148
Table 297: pdfMSym Extensible Harpoons . . . . .	148
Table 298: harpoon Extensible Harpoons . . . . .	148
Table 299: trfsigns Extensible Transform Symbols . . . . .	148
Table 300: esrelation Extensible Relations . . . . .	149
Table 301: halloweenmath Extensible Brooms and Pitchforks . . . . .	149
Table 302: halloweenmath Extensible Witches . . . . .	150
Table 303: halloweenmath Extensible Ghosts . . . . .	150
Table 304: halloweenmath Extensible Bats . . . . .	150
Table 305: holtpolt Non-commutative Division Symbols . . . . .	151
Table 306: Dots . . . . .	151
Table 307: $\mathcal{AMS}$ Dots . . . . .	151
Table 308: wasysym Dots . . . . .	151
Table 309: MnSymbol Dots . . . . .	152
Table 310: fdsymbol Dots . . . . .	152
Table 311: stix Dots . . . . .	152
Table 312: mathdots Dots . . . . .	153
Table 313: yhmath Dots . . . . .	153
Table 314: teubner Dots . . . . .	153
Table 315: logix Dots . . . . .	153
Table 316: begriff Begriffsschrift Symbols . . . . .	153
Table 317: frege Begriffsschrift Symbols . . . . .	154
Table 318: mathcomp Math Symbols . . . . .	154
Table 319: marvosym Math Symbols . . . . .	154
Table 320: marvosym Digits . . . . .	154
Table 321: fge Digits . . . . .	154
Table 322: dozenal Base-12 Digits . . . . .	155
Table 323: mathabx Mayan Digits . . . . .	155
Table 324: stix Infinities . . . . .	155
Table 325: stix Primes . . . . .	155
Table 326: stix Empty Sets . . . . .	155
Table 327: $\mathcal{AMS}$ Angles . . . . .	155
Table 328: MnSymbol Angles . . . . .	155
Table 329: fdsymbol Angles . . . . .	156
Table 330: boisik Angles . . . . .	156
Table 331: stix Angles . . . . .	156
Table 332: typicons Decorative Mathematical Symbols . . . . .	156
Table 333: fontawesome5 Decorative Mathematical Symbols . . . . .	157
Table 334: Miscellaneous L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub> Math Symbols . . . . .	157
Table 335: Miscellaneous $\mathcal{AMS}$ Math Symbols . . . . .	157
Table 336: Miscellaneous wasysym Math Symbols . . . . .	157
Table 337: Miscellaneous txfonts/pxfonts Math Symbols . . . . .	158

Table 338: Miscellaneous <code>mathabx</code> Math Symbols . . . . .	158
Table 339: Miscellaneous <code>MnSymbol</code> Math Symbols . . . . .	158
Table 340: Miscellaneous Internal <code>MnSymbol</code> Math Symbols . . . . .	158
Table 341: Miscellaneous <code>fdsymbol</code> Math Symbols . . . . .	159
Table 342: Miscellaneous <code>boisik</code> Math Symbols . . . . .	159
Table 343: Miscellaneous <code>stix</code> Math Symbols . . . . .	159
Table 344: Miscellaneous <code>textcomp</code> Text-mode Math Symbols . . . . .	160
Table 345: Miscellaneous <code>fge</code> Math Symbols . . . . .	160
Table 346: Miscellaneous <code>mathdesign</code> Math Symbols . . . . .	160
Table 347: Miscellaneous <code>logix</code> Math Symbols . . . . .	161
Table 348: Math Alphabets . . . . .	162
<b>4 Science and technology symbols</b>	<b>164</b>
Table 349: <code>gensymb</code> Symbols Defined to Work in Both Math and Text Mode . . . . .	164
Table 350: <code>wasysym</code> Electrical and Physical Symbols . . . . .	164
Table 351: <code>ifsym</code> Pulse Diagram Symbols . . . . .	164
Table 352: <code>ar</code> Aspect Ratio Symbol . . . . .	165
Table 353: <code>plimsoll</code> Plimsoll Symbol . . . . .	165
Table 354: <code>textcomp</code> Text-mode Science and Engineering Symbols . . . . .	165
Table 355: <code>steinmetz</code> Extensible Phasor Symbol . . . . .	165
Table 356: <code>emf</code> Electromotive Force Symbols . . . . .	165
Table 357: <code>wasysym</code> Astronomical Symbols . . . . .	166
Table 358: <code>marvosym</code> Astronomical Symbols . . . . .	166
Table 359: <code>mathabx</code> Astronomical Symbols . . . . .	166
Table 360: <code>stix</code> Astronomical Symbols . . . . .	166
Table 361: <code>utfsym</code> Astronomical Symbols . . . . .	167
Table 362: <code>starfont</code> Astronomical Symbols . . . . .	168
Table 363: <code>wasysym</code> APL Symbols . . . . .	168
Table 364: <code>stix</code> APL Symbols . . . . .	169
Table 365: <code>apl</code> APL Symbols . . . . .	169
Table 366: <code>marvosym</code> Computer Hardware Symbols . . . . .	169
Table 367: <code>keystroke</code> Computer Keys . . . . .	169
Table 368: <code>ascii</code> Control Characters (CP437) . . . . .	170
Table 369: <code>logic</code> Logic Gates . . . . .	170
Table 370: <code>quantikz</code> Quantum-Mechanics Notation . . . . .	171
Table 371: <code>marvosym</code> Communication Symbols . . . . .	171
Table 372: <code>marvosym</code> Engineering Symbols . . . . .	171
Table 373: <code>typicons</code> User-Interface Symbols . . . . .	171
Table 374: <code>fontawesome5</code> User-Interface Symbols . . . . .	173
Table 375: <code>wasysym</code> Biological Symbols . . . . .	176
Table 376: <code>stix</code> Biological Symbols . . . . .	176
Table 377: <code>marvosym</code> Biological Symbols . . . . .	176
Table 378: <code>utfsym</code> Biological Symbols . . . . .	176
Table 379: <code>fontawesome5</code> Biological Symbols . . . . .	176
Table 380: <code>marvosym</code> Safety-related Symbols . . . . .	176
Table 381: <code>feyn</code> Feynman Diagram Symbols . . . . .	177
Table 382: <code>svrsymbols</code> Physics Ideograms . . . . .	177
<b>5 Dingbats</b>	<b>179</b>
Table 383: <code>bbding</code> Arrows . . . . .	179
Table 384: <code>pifont</code> Arrows . . . . .	179

Table 385: adfsymbols Arrows . . . . .	180
Table 386: adforn Arrows . . . . .	180
Table 387: arev Arrows . . . . .	180
Table 388: utfsym Arrows . . . . .	181
Table 389: asapsym Arrows . . . . .	181
Table 390: typicons Arrows . . . . .	182
Table 391: fontawesome5 Arrows . . . . .	182
Table 392: marvosym Scissors . . . . .	182
Table 393: bbding Scissors . . . . .	182
Table 394: pifont Scissors . . . . .	182
Table 395: utfsym Scissors . . . . .	183
Table 396: dingbat Pencils . . . . .	183
Table 397: arev Pencils . . . . .	183
Table 398: typicons Pencils and Pens . . . . .	183
Table 399: fontawesome5 Pencils, Pens, and Nibs . . . . .	183
Table 400: bbding Pencils and Nibs . . . . .	183
Table 401: pifont Pencils and Nibs . . . . .	184
Table 402: utfsym Pencils, Pens, and Nibs . . . . .	184
Table 403: dingbat Fists . . . . .	184
Table 404: bbding Fists . . . . .	184
Table 405: pifont Fists . . . . .	184
Table 406: fourier Fists . . . . .	184
Table 407: arev Fists . . . . .	184
Table 408: utfsym Fists . . . . .	185
Table 409: typicons Fists . . . . .	185
Table 410: fontawesome5 Fists . . . . .	186
Table 411: bbding Crosses and Plusses . . . . .	186
Table 412: pifont Crosses and Plusses . . . . .	186
Table 413: adfsymbols Crosses and Plusses . . . . .	186
Table 414: utfsym Crosses and Plusses . . . . .	187
Table 415: arev Crosses . . . . .	187
Table 416: bbding Xs and Check Marks . . . . .	187
Table 417: pifont Xs and Check Marks . . . . .	187
Table 418: wasysym Xs and Check Marks . . . . .	187
Table 419: marvosym Xs and Check Marks . . . . .	187
Table 420: arev Xs and Check Marks . . . . .	187
Table 421: utfsym Xs and Check Marks . . . . .	188
Table 422: typicons Xs and Check Marks . . . . .	188
Table 423: fontawesome5 Xs and Check Marks . . . . .	188
Table 424: pifont Circled Numerals . . . . .	188
Table 425: utfsym Circled Numerals . . . . .	189
Table 426: wasysym Stars . . . . .	189
Table 427: bbding Stars, Flowers, and Similar Shapes . . . . .	189
Table 428: pifont Stars, Flowers, and Similar Shapes . . . . .	190
Table 429: adfsymbols Stars, Flowers, and Similar Shapes . . . . .	190
Table 430: utfsym Stars, Flowers, and Similar Shapes . . . . .	190
Table 431: adforn Stars . . . . .	190
Table 432: typicons Stars . . . . .	191
Table 433: fontawesome5 Stars . . . . .	191
Table 434: fourier Fleurons and Flowers . . . . .	191
Table 435: adforn Fleurons and Flowers . . . . .	191

Table 436: wasysym Geometric Shapes . . . . .	192
Table 437: MnSymbol Geometric Shapes . . . . .	192
Table 438: fdsymbol Geometric Shapes . . . . .	192
Table 439: boisk Geometric Shapes . . . . .	192
Table 440: stix Geometric Shapes . . . . .	193
Table 441: ifsym Geometric Shapes . . . . .	194
Table 442: bbding Geometric Shapes . . . . .	195
Table 443: pifont Geometric Shapes . . . . .	195
Table 444: universa Geometric Shapes . . . . .	195
Table 445: adfsymbols Geometric Shapes . . . . .	196
Table 446: utfsym Geometric Shapes . . . . .	196
Table 447: fontawesome5 Geometric Shapes . . . . .	196
Table 448: oplotsymb1 Geometric Shapes . . . . .	196
Table 449: adorn Flourishes . . . . .	197
Table 450: Miscellaneous oplotsymb1 Symbols . . . . .	198
Table 451: Miscellaneous dingbat Dingbats . . . . .	198
Table 452: Miscellaneous bbding Dingbats . . . . .	198
Table 453: Miscellaneous pifont Dingbats . . . . .	198
Table 454: Miscellaneous adorn Dingbats . . . . .	198
Table 455: Miscellaneous utfsym Dingbats . . . . .	199
<b>6 Ancient languages . . . . .</b>	<b>200</b>
Table 456: phaistos Symbols from the Phaistos Disk . . . . .	200
Table 457: protosem Proto-Semitic Characters . . . . .	201
Table 458: hieroglf Hieroglyphics . . . . .	202
Table 459: linearA Linear A Script . . . . .	202
Table 460: linearb Linear B Basic and Optional Letters . . . . .	205
Table 461: linearb Linear B Numerals . . . . .	205
Table 462: linearb Linear B Weights and Measures . . . . .	206
Table 463: linearb Linear B Ideograms . . . . .	206
Table 464: linearb Unidentified Linear B Symbols . . . . .	206
Table 465: cypriot Cypriot Letters . . . . .	207
Table 466: sarabian South Arabian Letters . . . . .	207
Table 467: teubner Archaic Greek Letters and Greek Numerals . . . . .	208
Table 468: boisk Archaic Greek Letters and Greek Numerals . . . . .	208
Table 469: epiolmec Epi-Olmec Script . . . . .	208
Table 470: epiolmec Epi-Olmec Numerals . . . . .	210
Table 471: allrunes Runes . . . . .	211
Table 472: allrunes Rune Separators . . . . .	211
<b>7 Musical symbols . . . . .</b>	<b>212</b>
Table 473: L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub> Musical Symbols . . . . .	212
Table 474: textcomp Musical Symbols . . . . .	212
Table 475: wasysym Musical Symbols . . . . .	212
Table 476: MnSymbol Musical Symbols . . . . .	212
Table 477: fdsymbol Musical Symbols . . . . .	213
Table 478: boisk Musical Symbols . . . . .	213
Table 479: stix Musical Symbols . . . . .	213
Table 480: arev Musical Symbols . . . . .	213
Table 481: utfsym Musical Symbols . . . . .	213
Table 482: MusiX <sub>T</sub> E <sub>X</sub> Musical Symbols . . . . .	214

Table 483: MusiX <sub>TEX</sub> Alternative Clefs . . . . .	215
Table 484: harmony Musical Symbols . . . . .	215
Table 485: musicography Musical Symbols . . . . .	216
Table 486: musicography Time Signatures . . . . .	216
Table 487: harmony Musical Accents . . . . .	217
Table 488: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Single Notes . . . . .	217
Table 489: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Beamed Notes . . . . .	218
Table 490: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Clefs . . . . .	218
Table 491: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Time Signatures . . . . .	219
Table 492: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Accidentals . . . . .	219
Table 493: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Rests . . . . .	219
Table 494: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Dynamics Letters . . . . .	219
Table 495: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Dynamics Symbols . . . . .	220
Table 496: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Articulations . . . . .	220
Table 497: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Scripts . . . . .	220
Table 498: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Accordion Notation . . . . .	220
Table 499: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Time Signatures . . . . .	220
Table 500: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Scripts . . . . .	221
Table 501: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Rests . . . . .	222
Table 502: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Pedals . . . . .	222
Table 503: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Flags . . . . .	223
Table 504: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Custodes . . . . .	223
Table 505: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Clefs . . . . .	224
Table 506: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Noteheads . . . . .	225
Table 507: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Accordion Symbols . . . . .	230
Table 508: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Accidentals . . . . .	231
Table 509: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Arrowheads . . . . .	232
Table 510: <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Alphanumerics and Punctuation . . . . .	232
Table 511: Miscellaneous <i>lily<sub>g</sub>lyp<sub>bs</sub></i> Named Musical Symbols . . . . .	232
<b>8 Gaming symbols</b>	<b>233</b>
Table 512: $\LaTeX$ 2 <sub>ε</sub> Playing-Card Suits . . . . .	233
Table 513: txfonts/pxfonts Playing-Card Suits . . . . .	233
Table 514: MnSymbol Playing-Card Suits . . . . .	233
Table 515: fdsymbol Playing-Card Suits . . . . .	233
Table 516: boisk Playing-Card Suits . . . . .	233
Table 517: stix Playing-Card Suits . . . . .	234
Table 518: arev Playing-Card Suits . . . . .	234
Table 519: twemojis Playing-Card Suits . . . . .	234
Table 520: utfsym Playing-Card Suits . . . . .	234
Table 521: utfsym Playing Cards . . . . .	235
Table 522: epsdice Dice . . . . .	235
Table 523: hhcount Dice . . . . .	236

Table 524: stix Dice . . . . .	236
Table 525: ifsym Dice . . . . .	236
Table 526: utfsym Dice . . . . .	236
Table 527: fontawesome5 Dice . . . . .	236
Table 528: utfsym Domino Tiles . . . . .	237
Table 529: utfsym Mahjong Tiles . . . . .	238
Table 530: utfsym Chess Pieces . . . . .	238
Table 531: skak Chess Informator Symbols . . . . .	239
Table 532: skak Chess Pieces and Chessboard Squares . . . . .	239
Table 533: fontawesome5 Chess Pieces and Chessboards . . . . .	240
Table 534: igo Go Symbols . . . . .	240
Table 535: go Go Symbols . . . . .	240
Table 536: fontawesome5 Sports . . . . .	240
Table 537: utfsym Games and Sports . . . . .	241
<b>9 Geographical Symbols</b>	<b>242</b>
Table 538: countriesofeuropa Country Maps . . . . .	242
Table 539: rojud Maps of Romanian Counties . . . . .	245
Table 540: euflag European Union Flag . . . . .	246
Table 541: worldflags Flags of Sovereign States . . . . .	247
Table 542: worldflags Flags of Non-Sovereign Countries and Territories . . . . .	248
Table 543: worldflags Flags of Austrian Federal States . . . . .	249
Table 544: twemojis Flags . . . . .	249
<b>10 Other symbols</b>	<b>253</b>
Table 545: textcomp Genealogical Symbols . . . . .	253
Table 546: wasysym General Symbols . . . . .	253
Table 547: utfsym Transportation Symbols . . . . .	254
Table 548: manfnt Dangerous Bend Symbols . . . . .	255
Table 549: Miscellaneous manfnt Symbols . . . . .	255
Table 550: marvosym Media Control Symbols . . . . .	255
Table 551: typicons Media Control Symbols . . . . .	255
Table 552: fontawesome5 Media Control Symbols . . . . .	256
Table 553: utfsym Media Control Symbols . . . . .	256
Table 554: typicons Left/Right Pointers . . . . .	256
Table 555: fontawesome5 Up/Down/Left/Right Pointers . . . . .	256
Table 556: marvosym Laundry Symbols . . . . .	257
Table 557: Miscellaneous marvosym Symbols . . . . .	257
Table 558: Miscellaneous universa Symbols . . . . .	257
Table 559: Miscellaneous fourier Symbols . . . . .	257
Table 560: utfsym Weather Symbols . . . . .	258
Table 561: twemojis Weather Symbols . . . . .	258
Table 562: ifsym Weather Symbols . . . . .	258
Table 563: typicons Weather Symbols . . . . .	259
Table 564: fontawesome5 Weather Symbols . . . . .	259
Table 565: figchild Weather Symbols . . . . .	259
Table 566: ifsym Alpine Symbols . . . . .	259
Table 567: ifsym Clocks . . . . .	260
Table 568: utfsym Clocks . . . . .	260
Table 569: clock Clocks . . . . .	260
Table 570: twemojis Clocks . . . . .	261

Table 571: typicons Time and Date Symbols . . . . .	261
Table 572: fontawesome5 Time and Date Symbols . . . . .	261
Table 573: twemojis Animals . . . . .	262
Table 574: fontawesome5 Animals . . . . .	263
Table 575: figchild Animals . . . . .	264
Table 576: utfsym Animals . . . . .	268
Table 577: hhcount Tally Markers . . . . .	268
Table 578: ifsym Tally Markers . . . . .	268
Table 579: bullcntr Tally Markers . . . . .	269
Table 580: dozenal Tally Markers . . . . .	269
Table 581: figchild Letters and Digits . . . . .	270
Table 582: skull Symbols . . . . .	270
Table 583: Non-Mathematical mathabx Symbols . . . . .	270
Table 584: Miscellaneous ifsym Symbols . . . . .	270
Table 585: asapsym Signs . . . . .	271
Table 586: metre Metrical Symbols . . . . .	271
Table 587: metre Small and Large Metrical Symbols . . . . .	271
Table 588: teubner Metrical Symbols . . . . .	272
Table 589: hamnosys Hand Shapes . . . . .	272
Table 590: hamnosys Hand-Shape Modifiers . . . . .	272
Table 591: hamnosys Extended Finger Directions . . . . .	272
Table 592: hamnosys Palm Orientations . . . . .	273
Table 593: hamnosys Body Locations . . . . .	273
Table 594: hamnosys Location Modifiers . . . . .	273
Table 595: hamnosys Movements . . . . .	274
Table 596: hamnosys Movement Modifiers . . . . .	274
Table 597: hamnosys Obsolete Spacing Symbols . . . . .	274
Table 598: Miscellaneous hamnosys Symbols . . . . .	275
Table 599: dictsym Dictionary Symbols . . . . .	275
Table 600: pmbxdraw Box-Drawing Symbols . . . . .	276
Table 601: staves Magical Staves . . . . .	276
Table 602: pigpen Cipher Symbols . . . . .	278
Table 603: $\mathbb{A}2e$ Phases of the Moon . . . . .	278
Table 604: twemojis Phases of the Moon . . . . .	278
Table 605: figchild Space Symbols . . . . .	279
Table 606: $\mathbb{A}2e$ Recycling Symbols . . . . .	279
Table 607: marvosym Recycling Symbols . . . . .	279
Table 608: utfsym Recycling Symbols . . . . .	279
Table 609: fontawesome5 Recycling Symbols . . . . .	280
Table 610: recycle Recycling Symbols . . . . .	280
Table 611: utfsym Plants and Flowers . . . . .	281
Table 612: utfsym Clothing . . . . .	281
Table 613: Miscellaneous $\mathbb{A}2e$ Symbols . . . . .	281
Table 614: soyombo Soyombo Symbols . . . . .	281
Table 615: knitting Knitting Symbols . . . . .	282
Table 616: worldflags Nautical Symbol Flags . . . . .	283
Table 617: Other worldflags Flags . . . . .	283
Table 618: twemojis Non-National Flags . . . . .	283
Table 619: fontawesome5 Flags . . . . .	284
Table 620: Miscellaneous arev Symbols . . . . .	284
Table 621: twemojis Food Emoji . . . . .	284

Table 622: figchild Food and Cooking Symbols . . . . .	286
Table 623: utfsym Food and Cooking Symbols . . . . .	287
Table 624: cookingsymbols Cooking Symbols . . . . .	287
Table 625: tikzsymbols Cooking Symbols . . . . .	288
Table 626: tikzsymbols Emoji . . . . .	288
Table 627: tikzsymbols 3D Emoji . . . . .	288
Table 628: utfsym Emoji . . . . .	289
Table 629: tikzsymbols Trees . . . . .	289
Table 630: utfsym Love Symbols . . . . .	290
Table 631: Miscellaneous tikzsymbols Symbols . . . . .	290
Table 632: Miscellaneous twemojis Emoji . . . . .	290
Table 633: fontawesome5 Faces . . . . .	305
Table 634: simpsons Characters from <i>The Simpsons</i> . . . . .	306
Table 635: asapsym People . . . . .	307
Table 636: utfsym People and Faces . . . . .	307
Table 637: sillypage Silly Walks . . . . .	308
Table 638: typicons Users . . . . .	308
Table 639: fontawesome5 Users . . . . .	308
Table 640: scsnowman Snowmen . . . . .	309
Table 641: typicons Files and Folders . . . . .	309
Table 642: fontawesome5 Files and Folders . . . . .	309
Table 643: fontawesome5 Religion . . . . .	310
Table 644: utfsym Religion . . . . .	310
Table 645: asapsym Elevators, Escalators, and Stairs . . . . .	310
Table 646: Miscellaneous bclgo Symbols . . . . .	311
Table 647: Miscellaneous utfsym Symbols . . . . .	312
Table 648: typicons Brand Icons . . . . .	314
Table 649: fontawesome5 Brand Icons . . . . .	315
Table 650: fontmfizz Brand Icons . . . . .	318
Table 651: fontawesome5 Medical Symbols . . . . .	319
Table 652: fontawesome5 Disability Symbols . . . . .	320
Table 653: asapsym Transportation Symbols . . . . .	320
Table 654: twemojis Transportation Emoji . . . . .	320
Table 655: asapsym Everyday Objects . . . . .	321
Table 656: typicons Everyday Objects . . . . .	322
Table 657: fontawesome5 Everyday Objects . . . . .	323
Table 658: figchild Everyday Objects . . . . .	325
Table 659: Miscellaneous asapsym Symbols . . . . .	327
Table 660: Miscellaneous typicons Symbols . . . . .	328
Table 661: Miscellaneous fontawesome5 Symbols . . . . .	328
Table 662: Miscellaneous fontmfizz Symbols . . . . .	329
Table 663: rubikcube Rubik’s Cube Rotations . . . . .	329
Table 664: sacsymb Orchestrated Objective Reduction Symbols . . . . .	329
Table 665: academicons Online Academic Profile Icons . . . . .	330
Table 666: Miscellaneous figchild Symbols . . . . .	331
<b>11 Fonts with minimal L<sup>A</sup>T<sub>E</sub>X support . . . . .</b>	<b>332</b>
Table 667: hands Fists . . . . .	332
Table 668: greenpoint Recycling Symbols . . . . .	332
Table 669: nkarta Map Symbols . . . . .	333
Table 670: moonphase Astronomical Symbols . . . . .	334



Table 671: <code>astrosym</code> Astronomical Symbols . . . . .	335
Table 672: <code>webomints</code> Decorative Borders . . . . .	338
Table 673: <code>umranda</code> Decorative Borders . . . . .	339
Table 674: <code>umrandb</code> Decorative Borders . . . . .	340
Table 675: <code>dingbat</code> Decorative Borders . . . . .	342
Table 676: <code>pgfornament</code> Decorative Borders (Vintage) . . . . .	343
Table 677: <code>pgfornament</code> Decorative Borders (Traditional Chinese Motifs) . . . . .	346
Table 678: <code>knot</code> Celtic Knots . . . . .	348
Table 679: <code>dancers</code> Dancing Men . . . . .	352
Table 680: <code>semaphor</code> Semaphore Alphabet . . . . .	355
Table 681: <code>lcircuit</code> Logic Gates and VLSI Symbols . . . . .	357
Table 682: <code>cryst</code> Crystallography Symbols . . . . .	358
Table 683: <code>dice</code> Dice . . . . .	360
Table 684: <code>figbas</code> Figured-Bass Ligatures . . . . .	360
Table 685: <code>magic</code> Trading Card Symbols . . . . .	361
Table 686: <code>bartel-chess-fonts</code> Chess Pieces and Chessboard Squares . . . . .	361
<b>12 Additional Information</b>	<b>364</b>
12.1 Symbol Name Clashes . . . . .	364
12.2 Resizing symbols . . . . .	366
12.3 Where can I find the symbol for ...? . . . . .	367
12.3.1 Reflecting and rotating existing symbols . . . . .	368
12.3.2 Joining and overlapping existing symbols . . . . .	368
12.3.3 Making new symbols work in superscripts and subscripts . . . . .	371
12.3.4 Modifying L <sup>A</sup> T <sub>E</sub> X-generated symbols . . . . .	373
12.3.5 Encircling symbols . . . . .	373
12.3.6 Producing complex accents . . . . .	373
12.3.7 Creating extensible symbols . . . . .	374
12.3.8 Developing new symbols from scratch . . . . .	375
12.4 Math-mode spacing . . . . .	379
12.5 Bold mathematical symbols . . . . .	380
12.6 ASCII and Latin 1 quick reference . . . . .	381
12.7 Unicode characters . . . . .	384
12.7.1 Inputting Unicode characters . . . . .	385
12.7.2 Outputting Unicode characters . . . . .	385
12.8 About this document . . . . .	386
12.9 Copyright and license . . . . .	388
<b>Bibliography</b>	<b>390</b>
<b>Index</b>	<b>391</b>

# Chapter 1

## Introduction

Welcome to the Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List! This document strives to be your primary source of L<sup>A</sup>T<sub>E</sub>X symbol information: font samples, L<sup>A</sup>T<sub>E</sub>X commands, packages, usage details, caveats—everything needed to put tens of thousands of different symbols at your disposal. All of the fonts covered herein meet the following criteria:

1. They are freely available from the Comprehensive T<sub>E</sub>X Archive Network (<https://www.ctan.org/>).
2. All of their symbols have L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> bindings. That is, a user should be able to access a symbol by name (e.g., `\bigtriangleup`).

As of version 12 of the Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List, that second restriction has been relaxed with the inclusion of Chapter 11, which showcases fonts that provide, at a minimum, either T<sub>E</sub>X font-metric files (`.tfm`) or the METAFONT sources (`.mf`) that produce those font-metric files. Some of the Chapter 11 fonts do include L<sup>A</sup>T<sub>E</sub>X font-definition files (`.fd`). However, what sets the fonts in Chapter 11 apart from the fonts in the rest of the document is that they lack a L<sup>A</sup>T<sub>E</sub>X style file (`.sty`) that individually names each of the glyphs.

The restrictions listed above are not particularly limiting criteria; the Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List contains samples of 20323 symbols—quite a large number. Some of these symbols are guaranteed to be available in every L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> system; others require fonts and packages that may not accompany a given distribution and that therefore need to be installed. See <http://www.texfaq.org/FAQ-installthings.html> for help with installing new fonts and packages.

### 1.1 Document Usage

Each chapter of this document contains a number of font tables. Each table shows a set of symbols, with the corresponding L<sup>A</sup>T<sub>E</sub>X command to the right of each symbol. A table’s caption indicates what package needs to be loaded in order to access that table’s symbols. For example, the symbols in Table 46, “textcomp Old-Style Numerals”, are made available by putting “`\usepackage{textcomp}`” in your document’s preamble. “*AMS*” means to use the *AMS* packages, viz. `amssymb` and/or `amsmath`. Notes below a table provide additional information about some or all the symbols in that table.

One note that appears a few times in this document, particularly in Chapter 2, indicates that certain symbols do not exist in the OT1 font encoding (Donald Knuth’s original, 7-bit font encoding, which is the default font encoding for L<sup>A</sup>T<sub>E</sub>X) and that you should use `fontenc` to select a different encoding, such as T1 (a common 8-bit font encoding). That means that you should put “`\usepackage[encoding]{fontenc}`” in your document’s preamble, where *encoding* is, e.g., T1 or LY1. To limit the change in font encoding to the current group, use “`\fontencoding{encoding}\selectfont`”.

Chapter 12 contains some additional information about the symbols in this document. It discusses how certain mathematical symbols can vary in height, shows which symbol names are not unique across packages, gives examples of how to create new symbols out of existing symbols, explains how symbols are spaced in math mode, compares various schemes for boldfacing symbols, presents L<sup>A</sup>T<sub>E</sub>X ASCII and Latin 1 tables, shows how to input and output Unicode characters, and provides some information about this document itself. The Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List ends with an index of all the symbols in the document and various additional useful terms.

A companion document, Raw Font Tables, also presents a large number of symbols but with a very different structure from this document. Raw Font Tables includes only symbols produced via a font file, while this document also includes composite symbols (combinations of two or more glyphs) and symbols drawn as pictures (using, e.g., TikZ). This document sorts symbols by category while Raw Font Tables sorts symbols by underlying font file. The two documents are intended to complement each other. It is usually easier to find a desired symbol in The Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List, but Raw Font Tables is helpful for identifying related symbols, for finding symbols that exist in some font but are not exposed to the user via a L<sup>A</sup>T<sub>E</sub>X package (or that this document inadvertently overlooked), and for the font name and character position needed to typeset a single symbol in isolation. The last of those is especially important for math symbols. T<sub>E</sub>X imposes a limitation of at most 16 math alphabets per document, but symbols typeset with `\font` and `\char` are text symbols and do not consume a math alphabet. (They are less convenient to use within a mathematical expression, however.)

## 1.2 Frequently Requested Symbols

There are a number of symbols that are requested over and over again on `comp.text.tex`. If you're looking for such a symbol the following list will help you find it quickly.

<code>_,</code> as in “ <code>Spaces_are_significant.</code> ” . . . . .	19	<code>\dots</code> . . . . .	153
<code>\bar</code> , <code>\tilde</code> , <code>\acute</code> , <code>\grave</code> , <code>\check</code> , etc. (versus <code>\bar</code> , <code>\tilde</code> , <code>\acute</code> , <code>\grave</code> , and <code>\check</code> ) . . . . .	26	<code>^\circ</code> , as in “ <code>180^\circ</code> ” or “ <code>15^\circ C</code> ” . . . . .	160
<code>\c</code> . . . . .	31	$\mathcal{L}$ , $\mathcal{F}$ , etc. . . . .	162
<code>\e</code> . . . . .	32	$\mathbb{N}$ , $\mathbb{Z}$ , $\mathbb{R}$ , etc. . . . .	162
<code>\copyright</code> , <code>\R</code> , and <code>^\text{TM}</code> . . . . .	33	$\varkappa$ . . . . .	162
<code>\%</code> . . . . .	34	$f$ . . . . .	371
$\mathfrak{f}$ . . . . .	56	<code>\acute{a}</code> , <code>\grave{e}</code> , etc. (i.e., several accents per character) . . . . .	373
<code>\therefore</code> . . . . .	68	<code>\langle</code> , <code>\rangle</code> , and <code> </code> (instead of <code>\l</code> , <code>\r</code> , and <code>\text{---}</code> ) . . . . .	381
<code>\:=</code> and <code>\::=</code> . . . . .	69	<code>\^</code> and <code>\~</code> (or <code>\sim</code> ) . . . . .	382
<code>\lesssim</code> and <code>\gtrsim</code> . . . . .	85		

## Chapter 2

# Body-text symbols

This chapter lists symbols that are intended for use in running text, such as punctuation marks, accents, ligatures, and currency symbols.

TABLE 1:  $\text{\LaTeX} 2_{\epsilon}$  Escapable “Special” Characters

\$	$\backslash$ \$	%	$\backslash$ %	-	$\backslash$ _*	}	$\backslash$ }	&	$\backslash$ &	#	$\backslash$ #	{	$\backslash$ {
----	-----------------	---	----------------	---	-----------------	---	----------------	---	----------------	---	----------------	---	----------------

\* The `underscore` package redefines “\_” to produce an underscore in text mode (i.e., it makes it unnecessary to escape the underscore character).

TABLE 2: Predefined L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Text-mode Commands

$\hat{\text{~}}$		<code>\textasciicircum*</code>	<		<code>\textless</code>
$\tilde{\text{~}}$		<code>\textasciitilde*</code>	a	<i>a</i>	<code>\textordfeminine</code>
*	*	<code>\textasteriskcentered</code>	o	<i>o</i>	<code>\textordmasculine</code>
\		<code>\textbackslash</code>	¶	<i>¶</i>	<code>\textparagraph<sup>†</sup></code>
		<code>\textbar</code>	.	<i>.</i>	<code>\textperiodcentered</code>
		<code>\textbardbl</code>	% <sub>000</sub>	<i>%<sub>000</sub></i>	<code>\textpertenthousand</code>
○	○	<code>\textbigcircle</code>	% <sub>00</sub>	<i>%<sub>00</sub></i>	<code>\textperthousand</code>
{		<code>\textbraceleft<sup>†</sup></code>	¿		<code>\textquestiondown</code>
}		<code>\textbraceright<sup>†</sup></code>	“		<code>\textquotedblleft</code>
•	•	<code>\textbullet</code>	”		<code>\textquotedblright</code>
©	©	<code>\textcopyright<sup>†</sup></code>	‘		<code>\textquoteleft</code>
†	†	<code>\textdagger<sup>†</sup></code>	,		<code>\textquoteright</code>
‡	‡	<code>\textdaggerdbl<sup>†</sup></code>	®	<i>®</i>	<code>\textregistered</code>
\$	\$	<code>\textdollar<sup>†</sup></code>	§	<i>§</i>	<code>\textsection<sup>†</sup></code>
...		<code>\textellipsis<sup>†</sup></code>	£	<i>£</i>	<code>\textsterling<sup>†</sup></code>
—		<code>\textemdash</code>	™	<i>™</i>	<code>\texttrademark</code>
-		<code>\textendash</code>	-		<code>\textunderscore<sup>†</sup></code>
i		<code>\textexclamdown</code>	ı		<code>\textvisiblespace</code>
>		<code>\textgreater</code>			

The first symbol column represents the—sometimes “faked”—symbol that L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> provides by default. The second symbol column represents the symbol as redefined by `textcomp` (if `textcomp` redefines it). The `textcomp` package is generally required to typeset Table 2’s symbols in italic, and some symbols additionally require the T1 font encoding for italic.

\* `\^{}{}` and `\~{}{}` can be used instead of `\textasciicircum` and `\textasciitilde`. See the discussion of “~” on page 382.

† It’s generally preferable to use the corresponding symbol from Table 3 because the symbols in that table work properly in both text mode and math mode.

TABLE 3: L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Commands Defined to Work in Both Math and Text Mode

{	\{	-	\_	‡	‡	<code>\ddag</code>	£	<code>\pounds</code>
}	\}	©	©	<code>\copyright</code>	...	<code>\dots</code>	§	<code>\S</code>
\$	\\$	†	†	<code>\dag</code>	¶	¶	<code>\P</code>	

The first symbol column represents the—sometimes “faked”—symbol that L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> provides by default. The second symbol column represents the symbol as redefined by `textcomp` (if `textcomp` redefines it). The `textcomp` package is generally required to typeset Table 3’s symbols in italic, and some symbols additionally require the T1 font encoding for italic.

TABLE 4:  $\mathcal{AMS}$  Commands Defined to Work in Both Math and Text Mode

✓ `\checkmark`    ® `\circledR`    ✠ `\maltese`

TABLE 5: Non-ASCII Letters (Excluding Accented Letters)

å	<code>\aa</code>	Ð	<code>\DH*</code>	L	<code>\L</code>	ø	<code>\o</code>	þ	<code>\th*</code>
Å	<code>\AA</code>	Ð	<code>\DJ*</code>	l	<code>\l</code>	œ	<code>\oe</code>	Þ	<code>\TH*</code>
Æ	<code>\AE</code>	đ	<code>\dj*</code>	l	<code>\l</code>	Œ	<code>\OE</code>		
æ	<code>\ae</code>	IJ	<code>\IJ</code>	ŋ	<code>\ng*</code>	ß	<code>\ss</code>		
ð	<code>\dh*</code>	ij	<code>\ij</code>	Ø	<code>\O</code>	SS	<code>\SS</code>		

\* Not available in the OT1 font encoding. Use the `fontenc` package to select an alternate font encoding, such as T1.

TABLE 6: `textgreek` Upright Greek Letters

α	<code>\textalpha</code>	η	<code>\texteta</code>	ν	<code>\textnu</code>	τ	<code>\texttau</code>
β	<code>\textbeta</code>	θ	<code>\texttheta</code>	ξ	<code>\textxi</code>	υ	<code>\textupsilon</code>
γ	<code>\textgamma</code>	ι	<code>\textiota</code>	ο	<code>\textomikron</code>	φ	<code>\textphi</code>
δ	<code>\textdelta</code>	κ	<code>\textkappa</code>	π	<code>\textpi</code>	χ	<code>\textchi</code>
ε	<code>\textepsilon</code>	λ	<code>\textlambda</code>	ρ	<code>\textrho</code>	ψ	<code>\textpsi</code>
ζ	<code>\textzeta</code>	μ	<code>\textmu*</code>	σ	<code>\textsigma</code>	ω	<code>\textomega</code>
A	<code>\textAlpha</code>	H	<code>\textEta</code>	N	<code>\textNu</code>	T	<code>\textTau</code>
B	<code>\textBeta</code>	Θ	<code>\textTheta</code>	Ξ	<code>\textXi</code>	Υ	<code>\textUpsilon</code>
Γ	<code>\textGamma</code>	I	<code>\textIota</code>	Ο	<code>\textOmikron</code>	Φ	<code>\textPhi</code>
Δ	<code>\textDelta</code>	K	<code>\textKappa</code>	Π	<code>\textPi</code>	Χ	<code>\textChi</code>
E	<code>\textEpsilon</code>	Λ	<code>\textLambda</code>	P	<code>\textRho</code>	Ψ	<code>\textPsi</code>
Z	<code>\textZeta</code>	M	<code>\textMu</code>	Σ	<code>\textSigma</code>	Ω	<code>\textOmega</code>

\* Synonyms for `\textmu` include `\textmicro` and `\textmugreek`.

`textgreek` tries to use a Greek font that matches the body text. As a result, the glyphs may appear slightly different from the above.

Unlike `upgreek` (Table 211 on page 121), `textgreek` works in text mode.

The symbols in this table are intended to be used sporadically throughout a document (e.g., in phrases such as “β-decay”). In contrast, Greek body text can be typeset using the `babel` package’s `greek` (or `polutonikogreek`) option—and, of course, a font that provides the glyphs for the Greek alphabet.

TABLE 7: Letters Used to Typeset African Languages

Đ	\B{D}	ĉ	\m{c}	f	\m{f}	k	\m{k}	t	\M{t}	Ʒ	\m{Z}
đ	\B{d}	Đ	\m{D}	F	\m{F}	Đ	\m{N}	T	\M{T}	Ě	\T{E}
H	\B{H}	đ	\M{d}	Ƴ	\m{G}	ŋ	\m{n}	t	\m{t}	ē	\T{e}
h	\B{h}	Đ	\M{D}	Ƴ	\m{g}	o	\m{o}	T	\m{T}	Ō	\T{O}
t	\B{t}	đ	\m{d}	ł	\m{I}	Ō	\m{O}	v	\m{u}*	ō	\T{o}
T	\B{T}	Ě	\m{E}	ı	\m{i}	P	\m{P}	U	\m{U}*		
ḃ	\m{b}	ε	\m{e}	Ń	\m{J}	ḃ	\m{p}	Y	\m{Y}		
Ḃ	\m{B}	Ǝ	\M{E}	ɲ	\m{j}	ƒ	\m{s}	Ƴ	\m{y}		
Ċ	\m{C}	ə	\M{e}	K	\m{K}	J	\m{S}	Ʒ	\m{z}		

These characters all need the T4 font encoding, which is provided by the `fc` package.

\* `\m{v}` and `\m{V}` are synonyms for `\m{u}` and `\m{U}`.

TABLE 8: Letters Used to Typeset Vietnamese

Ơ	\OHORN	ơ	\ohorn	Ư	\UHORN	ư	\uhorn
---	--------	---	--------	---	--------	---	--------

These characters all need the T5 font encoding, which is provided by the `vtex` package.

TABLE 9: Punctuation Marks Not Found in OT1

«	\guillemetleft*	<	\guilsinglleft	„	\quotedblbase	"	\textquotedbl
»	\guillemetright*	>	\guilsinglright	,	\quotesinglbase		

\* Older versions of  $\text{\LaTeX}$  misspelled these as `\guillemotleft` and `\guillemotright`. The older names are still retained for backward compatibility.

To get these symbols, use the `fontenc` package to select an alternate font encoding, such as T1.

TABLE 10: `pifont` Decorative Punctuation Marks

•	\ding{123}	“	\ding{125}	¶	\ding{161}	‡	\ding{163}
•	\ding{124}	”	\ding{126}	•	\ding{162}		

TABLE 11: fontawesome5 Decorative Punctuation Marks and Typographic Symbols

<b>*</b>	<code>\faAsterisk</code>	<b>!</b>	<code>\faExclamation</code>	<b>”</b>	<code>\faQuoteRight</code>
<b>@</b>	<code>\faAt</code>	<b>¶</b>	<code>\faParagraph</code>	<b>/</b>	<code>\faSlash</code>
<b>⋯</b>	<code>\faEllipsisH</code>	<b>?</b>	<code>\faQuestion</code>		
<b>⋮</b>	<code>\faEllipsisV</code>	<b>“</b>	<code>\faQuoteLeft</code>		

TABLE 12: tipa Phonetic Symbols

$\gamma$	<code>\textbabygamma</code>	$\text{̥}$	<code>\textglotstop</code>	$\eta$	<code>\textrtailn</code>
$\text{̄}$	<code>\textbarb</code>	$\text{̇}$	<code>\texthalflength</code>	$\text{̣}$	<code>\textrtailr</code>
$\text{̂}$	<code>\textbarc</code>	$\text{̆}$	<code>\texthardsign</code>	$\text{̤}$	<code>\textrtails</code>
$\text{̄}$	<code>\textbard</code>	$\text{̈}$	<code>\texthooktop</code>	$\text{̦}$	<code>\textrtailt</code>
$\text{̇}$	<code>\textbardotlessj</code>	$\text{̇}$	<code>\texthtb</code>	$\text{̧}$	<code>\textrtailz</code>
$\text{̆}$	<code>\textbarg</code>	$\text{̈}$	<code>\texthtbardotlessj</code>	$\text{̇}$	<code>\textrthook</code>
$\text{̥}$	<code>\textbarglotstop</code>	$\text{̈}$	<code>\texthtc</code>	$\text{̂}$	<code>\textasca</code>
$\text{̄}$	<code>\textbari</code>	$\text{̈}$	<code>\texthtd</code>	$\text{̂}$	<code>\textscb</code>
$\text{̄}$	<code>\textbarl</code>	$\text{̆}$	<code>\texthtg</code>	$\text{̂}$	<code>\textsce</code>
$\text{̄}$	<code>\textbaro</code>	$\text{̆}$	<code>\texthth</code>	$\text{̂}$	<code>\textscg</code>
$\text{̆}$	<code>\textbarrevglotstop</code>	$\text{̆}$	<code>\texththeng</code>	$\text{̂}$	<code>\textsch</code>
$\text{̄}$	<code>\textbaru</code>	$\text{̆}$	<code>\texthtk</code>	$\text{̄}$	<code>\textschwa</code>
$\text{̄}$	<code>\textbeltl</code>	$\text{̆}$	<code>\texthtp</code>	$\text{̂}$	<code>\textsci</code>
$\text{̂}$	<code>\textbeta</code>	$\text{̆}$	<code>\texthtq</code>	$\text{̂}$	<code>\textscj</code>
$\text{̄}$	<code>\textbullseye</code>	$\text{̆}$	<code>\texthttrtaild</code>	$\text{̂}$	<code>\textsccl</code>
$\text{̇}$	<code>\textceltpal</code>	$\text{̈}$	<code>\texthtscg</code>	$\text{̂}$	<code>\textscn</code>
$\chi$	<code>\textchi</code>	$\text{̈}$	<code>\texthtt</code>	$\text{̂}$	<code>\textscscoelig</code>
$\text{̄}$	<code>\textcloseepsilon</code>	$\text{̈}$	<code>\texthvlig</code>	$\text{̂}$	<code>\textscomega</code>
$\text{̄}$	<code>\textcloseomega</code>	$\text{̈}$	<code>\textinvglotstop</code>	$\text{̂}$	<code>\textscr</code>
$\text{̄}$	<code>\textcloserevepsilon</code>	$\text{̂}$	<code>\textinvscr</code>	$\text{̂}$	<code>\textscripta</code>
$\text{̆}$	<code>\textcommatailz</code>	$\text{̈}$	<code>\textiota</code>	$\text{̆}$	<code>\textscriptg</code>
$\text{̇}$	<code>\textcorner</code>	$\lambda$	<code>\textlambda</code>	$\text{̈}$	<code>\textscriptv</code>
$\text{̄}$	<code>\textcrb</code>	$\text{̈}$	<code>\textlengthmark</code>	$\text{̈}$	<code>\textscu</code>
$\text{̄}$	<code>\textcrd</code>	$\text{̆}$	<code>\textlhookt</code>	$\text{̂}$	<code>\textscy</code>
$\text{̆}$	<code>\textcrg</code>	$\text{̄}$	<code>\textlhtlongi</code>	$\text{̈}$	<code>\textsecstress</code>
$\text{̄}$	<code>\textcrh</code>	$\text{̆}$	<code>\textlhtlongy</code>	$\text{̂}$	<code>\textsoftsign</code>
$\text{̈}$	<code>\textcrinvglotstop</code>	$\text{̄}$	<code>\textlonglegr</code>	$\text{̂}$	<code>\textstretchc</code>
$\lambda$	<code>\textcrlambda</code>	$\text{̈}$	<code>\textlptr</code>	$\text{̆}$	<code>\texttctclig</code>
$\text{̆}$	<code>\textcrtwo</code>	$\text{̆}$	<code>\textltailm</code>	$\text{̆}$	<code>\textteshlig</code>
$\text{̆}$	<code>\textctc</code>	$\text{̆}$	<code>\textltailn</code>	$\text{̄}$	<code>\texttheta</code>
$\text{̄}$	<code>\textctd</code>	$\text{̄}$	<code>\textltilde</code>	$\text{̆}$	<code>\textthorn</code>
$\text{̆}$	<code>\textctdctzlig</code>	$\text{̆}$	<code>\textlyoghlig</code>	$\text{̄}$	<code>\texttoneletterstem</code>
$\text{̆}$	<code>\textctesh</code>	$\text{̆}$	<code>\textObardotlessj</code>	$\text{̆}$	<code>\texttslig</code>

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j	<code>\textctj</code>	h	<code>\textOlyoghlig</code>	e	<code>\textturna</code>
n	<code>\textctn</code>	ω	<code>\textomega</code>	æ	<code>\textturncelig</code>
t	<code>\textctt</code>	⋈	<code>\textopencorner</code>	u	<code>\textturnh</code>
⌘	<code>\textcttctclig</code>	o	<code>\textopeno</code>	ɣ	<code>\textturnk</code>
z	<code>\textctyogh</code>	⋈	<code>\textpalhook</code>	l	<code>\textturnlongleg</code>
z	<code>\textctz</code>	φ	<code>\textphi</code>	u	<code>\textturnm</code>
⌘	<code>\textdctzlig</code>		<code>\textpipe</code>	u	<code>\textturnmrlig</code>
f	<code>\textdoublebaresh</code>	ˈ	<code>\textprimstress</code>	r	<code>\textturnr</code>
≠	<code>\textdoublebarpipe</code>	ʔ	<code>\textraiseglotstop</code>	ɹ	<code>\textturnrrtail</code>
≠	<code>\textdoublebarslash</code>	ɿ	<code>\textraisevibi</code>	ɔ	<code>\textturnscripta</code>
	<code>\textdoublepipe</code>	ɣ	<code>\textramshorns</code>	ɹ	<code>\textturnt</code>
	<code>\textdoublevertline</code>	ˈ	<code>\textrevapostrophe</code>	Λ	<code>\textturnv</code>
↓	<code>\textdownstep</code>	ə	<code>\textreve</code>	Ⓜ	<code>\textturnw</code>
⌘	<code>\textdyoghlig</code>	z	<code>\textrelepsilon</code>	ʌ	<code>\textturny</code>
⌘	<code>\textdzlig</code>	ɿ	<code>\textrevglotstop</code>	u	<code>\textupsilon</code>
ε	<code>\textepsilon</code>	z̄	<code>\textrevyogh</code>	↑	<code>\textupstep</code>
f	<code>\textesh</code>	z̄	<code>\textrhookrelepsilon</code>		<code>\textvertline</code>
r	<code>\textfishhookr</code>	z̄	<code>\textrhookschwa</code>	ɿ	<code>\textvibi</code>
g	<code>\textg</code>	z̄	<code>\textrhoticity</code>	ɿ	<code>\textvibyy</code>
γ	<code>\textgamma</code>	>	<code>\textrptr</code>	p	<code>\textwynn</code>
↘	<code>\textglobfall</code>	d	<code>\textrtaild</code>	z	<code>\textyogh</code>
↗	<code>\textglobrise</code>	l	<code>\textrtaill</code>		

`tipa` defines shortcut characters for many of the above. It also defines a command `\tone` for denoting tone letters (itches). See the `tipa` documentation for more information.

TABLE 13: `tipx` Phonetic Symbols

æ	<code>\textaoilig</code>	f	<code>\texthtbardotlessjvar</code>	l	<code>\textrthooklong</code>
z̄	<code>\textbenttailyogh</code>	ω	<code>\textinvomega</code>	Ⓜ	<code>\textascaolig</code>
γ	<code>\textbktailgamma</code>	v	<code>\textinvsa</code>	Δ	<code>\textscdelta</code>
ɿ	<code>\textctinvglotstop</code>	σ	<code>\textinvscripta</code>	F	<code>\textscf</code>
j	<code>\textctjvar</code>	f	<code>\textlfishhookrlig</code>	K	<code>\textscck</code>
⌘	<code>\textctstretchc</code>	f	<code>\textlhookfour</code>	M	<code>\textscm</code>
⌘	<code>\textctstretchcvar</code>	p	<code>\textlhookp</code>	P	<code>\textscp</code>
ɹ	<code>\textctturnt</code>	r	<code>\textlhiti</code>	Q	<code>\textscq</code>
db	<code>\textdblign</code>	l	<code>\textllooptoprevesh</code>	←	<code>\textspleftarrow</code>
≠	<code>\textdoublebarpipevar</code>	η	<code>\textnrleg</code>	C	<code>\textstretchcvar</code>
	<code>\textdoublepipevar</code>	⊙	<code>\textObullseye</code>	↔	<code>\textsubdoublearrow</code>

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↓	<code>\textdownfullarrow</code>	⋈	<code>\textpalhooklong</code>	→	<code>\textsubrightarrow</code>
♀	<code>\textfemale</code>	⋉	<code>\textpalhookvar</code>	⋈	<code>\textthornvari</code>
⌌	<code>\textfrbarn</code>		<code>\textpipevar</code>	⋈	<code>\textthornvarii</code>
⌍	<code>\textfrhookd</code>	ϕ	<code>\textqplig</code>	⋈	<code>\textthornvariii</code>
⌎	<code>\textfrhookdvar</code>	◻	<code>\textrectangle</code>	⋈	<code>\textthornvariv</code>
⌏	<code>\textfrhookt</code>	↶	<code>\textretractingvar</code>	⌏	<code>\textturnglotstop</code>
γ	<code>\textfrrtailgamma</code>	⌏	<code>\textrevscl</code>	⌏	<code>\textturnsck</code>
?	<code>\textglotstopvari</code>	⌏	<code>\textrevscr</code>	⌏	<code>\textturnscu</code>
?	<code>\textglotstopvarii</code>	⌏	<code>\textrhoa</code>	ε	<code>\textturnthree</code>
?	<code>\textglotstopvariii</code>	⌏	<code>\textrhoe</code>	ζ	<code>\textturntwo</code>
γ	<code>\textgrgamma</code>	ε	<code>\textrhoeepsilon</code>	♀	<code>\textuncrffemale</code>
⌏	<code>\textheng</code>	⌏	<code>\textrhoekopeno</code>	↑	<code>\textupfullarrow</code>
⌏	<code>\texthmlig</code>	⌏	<code>\textrtailhth</code>		

TABLE 14: wsuipa Phonetic Symbols

⌏	<code>\babygamma</code>	⌏	<code>\eng</code>	⌏	<code>\labdentalnas</code>	ə	<code>\schwa</code>
⌏	<code>\barb</code>	⌏	<code>\er</code>	⌏	<code>\latfric</code>	ɪ	<code>\sci</code>
⌏	<code>\bard</code>	⌏	<code>\esh</code>	⌏	<code>\legm</code>	N	<code>\scn</code>
⌏	<code>\bari</code>	⌏	<code>\eth</code>	⌏	<code>\legr</code>	R	<code>\scr</code>
⌏	<code>\barl</code>	⌏	<code>\flapr</code>	⌏	<code>\lz</code>	α	<code>\scripta</code>
⌏	<code>\baro</code>	⌏	<code>\glotstop</code>	α	<code>\nialpha</code>	g	<code>\scriptg</code>
⌏	<code>\barp</code>	⌏	<code>\hookb</code>	β	<code>\nibeta</code>	υ	<code>\scriptv</code>
⌏	<code>\barsci</code>	⌏	<code>\hookd</code>	χ	<code>\nichi</code>	U	<code>\scu</code>
⌏	<code>\barscu</code>	⌏	<code>\hookg</code>	ε	<code>\niepsilon</code>	Y	<code>\scy</code>
⌏	<code>\baru</code>	⌏	<code>\hookh</code>	γ	<code>\nigamma</code>	⌏	<code>\slashb</code>
⊙	<code>\clickb</code>	⌏	<code>\hookheng</code>	ι	<code>\niiota</code>	⌏	<code>\slashc</code>
⊙	<code>\clickc</code>	⌏	<code>\hookrepepsilon</code>	λ	<code>\nilambda</code>	⌏	<code>\slashd</code>
⌏	<code>\clickt</code>	⌏	<code>\hv</code>	ω	<code>\niomega</code>	⌏	<code>\slashu</code>
⌏	<code>\closedniomega</code>	⌏	<code>\inva</code>	φ	<code>\nipheri</code>	⌏	<code>\taild</code>
⌏	<code>\closedrepepsilon</code>	⌏	<code>\invf</code>	σ	<code>\nisigma</code>	⌏	<code>\tailinvr</code>
⌏	<code>\crossb</code>	⌏	<code>\invglotstop</code>	θ	<code>\nitheta</code>	⌏	<code>\taill</code>
⌏	<code>\crossd</code>	⌏	<code>\invh</code>	ϖ	<code>\niupsilon</code>	⌏	<code>\tailn</code>
⌏	<code>\crossh</code>	⌏	<code>\invlegr</code>	⌏	<code>\nj</code>	⌏	<code>\tailr</code>
⌏	<code>\crossnilambda</code>	⌏	<code>\invm</code>	∞	<code>\oo</code>	⌏	<code>\tails</code>
⌏	<code>\curlyc</code>	⌏	<code>\invr</code>	⌏	<code>\openo</code>	⌏	<code>\tailt</code>
⌏	<code>\curlyesh</code>	⌏	<code>\invscr</code>	⌏	<code>\reve</code>	⌏	<code>\tailz</code>

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ȝ	\curlyyogh	ɀ	\invscripta	ʄ	\reveject	ʧ	\tesh
z	\curlyz	Λ	\invv	ʒ	\revepsilon	þ	\thorn
ɨ	\dlbari	Ⓜ	\invw	ʝ	\revglotstop	†	\tildel
ɖ	\dz	ʌ	\invy	D	\scd	ʒ	\yogh
ɸ	\ejective	γ	\ipagamma	G	\scg		

TABLE 15: wasysym Phonetic Symbols

ð	\dh	ə	\inve	ʒ	\roundz	þ	\thorn
Ð	\DH	ɔ	\openo	Þ	\Thorn		

TABLE 16: phonetic Phonetic Symbols

ɹ	\barj	ɾ	\flap	ɨ	\ibar	ɀ	\rotvara	ɹ	\vari
λ	\barlambda	ʔ	\glottal	ɔ	\openo	Ⓜ	\rotw	Ω	\varomega
ɱ	\emgma	ʙ	\hausab	ħ	\planck	ʌ	\roty	ɔ	\varopeno
ɱ	\engma	ʙ	\hausab	Λ	\pwedge	ə	\schwa	ɹ	\vod
ɱ	\enya	ɖ	\hausad	ɀ	\revD	þ	\thorn	fi	\voicedh
ε	\epsi	Ð	\hausad	ɹ	\riota	ɸ	\ubar	ʒ	\yogh
ʃ	\esh	ƙ	\hausak	ɹ	\rotm	ɹ	\udesc		
ð	\eth	K	\hausak	Ω	\rotOmega	ɑ	\vara		
fj	\fj	ɖ	\hookd	ɹ	\rotr	g	\varg		

TABLE 17: t4phonet Phonetic Symbols

đ	\textcrd	ɖ	\texthtd		\textpipe
ħ	\textcrh	ƙ	\texthtk	ɖ	\textrtaild
ε	\textepsilon	ɸ	\texthtp	ɨ	\textrtailt
ʃ	\textesh	ɨ	\texthtt	ɖ	\textschwa
fj	\textfjlig	ɹ	\textiota	ʃ	\textscriptv
ʙ	\texthtb	ɱ	\textltailn	ʧ	\texttleshlig
ɨ	\texthtc	ɔ	\textopeno	ʒ	\textyogh

The idea behind the t4phonet package’s phonetic symbols is to provide an interface to some of the characters in the T4 font encoding (Table 7 on the next page) but using the same names as the tipa characters presented in Table 12 on page 22.

TABLE 18: semtrans Transliteration Symbols

ⵏ	\Alif	ⵍ	\Ayn
---	-------	---	------

TABLE 19: Text-mode Accents

Ää	<code>\{"A}\{"a}</code>	Áá	<code>\ {A}\ {a}</code> <sup>‡</sup>	Ââ	<code>\f{A}\f{a}</code> <sup>¶</sup>	Â̂	<code>\t{A}\t{a}</code>
Áá	<code>\' {A}\' {a}</code>	Ãã	<code>\~ {A}\~ {a}</code>	Ăă	<code>\G{A}\G{a}</code> <sup>‡</sup>	Ăă	<code>\u{A}\u{a}</code>
Ăă	<code>\. {A}\. {a}</code>	Ȧȧ	<code>\b{A}\b{a}</code>	Ȧȧ	<code>\h{A}\h{a}</code> <sup>§</sup>	Ȧȧ	<code>\U{A}\U{a}</code> <sup>‡</sup>
Ȧȧ	<code>\={A}\={a}</code>	Ȧȧ	<code>\c{A}\c{a}</code>	Ȧȧ	<code>\H{A}\H{a}</code>	Ȧȧ	<code>\U{A}\U{a}</code> <sup>¶</sup>
Ȧȧ	<code>\^{A}\^{a}</code>	Ȧȧ	<code>\C{A}\C{a}</code> <sup>¶</sup>	Ȧȧ	<code>\k{A}\k{a}</code> <sup>†</sup>	Ȧȧ	<code>\v{A}\v{a}</code>
Ȧȧ	<code>\' {A}\' {a}</code>	Ȧȧ	<code>\d{A}\d{a}</code>	Ȧȧ	<code>\r{A}\r{a}</code>		
		Ȧȧ	<code>\newtie{A}\newtie{a}</code> *	Ⓐⓐ	<code>\textcircled{A}\textcircled{a}</code> <sup>  </sup>		

\* Requires the `textcomp` package.

<sup>†</sup> Not available in the OT1 font encoding. Use the `fontenc` package to select an alternate font encoding, such as T1.

<sup>‡</sup> Requires the T4 font encoding, provided by the `fc` package.

<sup>§</sup> Requires the T5 font encoding, provided by the `vntex` package.

<sup>¶</sup> Requires one of the Cyrillic font encodings (T2A, T2B, T2C, or X2). Use the `fontenc` package to select an encoding.

<sup>||</sup> See also the `circledsteps` package, which uses `TikZ` to encircle symbols of any size.

Also note the existence of `\i` and `\j`, which produce dotless versions of “i” and “j” (viz., “ı” and “ȷ”). These are useful when the accent is supposed to replace the dot in encodings that need to composite (i.e., combine) letters and accents. For example, “`na\{"i}ve`” always produces a correct “naïve”, while “`na\{i}ve`” yields the rather odd-looking “naïve” when using the OT1 font encoding and older versions of L<sup>A</sup>T<sub>E</sub>X. Font encodings other than OT1 and newer versions of L<sup>A</sup>T<sub>E</sub>X properly typeset “`na\{i}ve`” as “naïve”.

TABLE 20: tipa Text-mode Accents

Á́	<code>\textacutemacron{A}\textacutemacron{a}</code>
Á̂	<code>\textacutewedge{A}\textacutewedge{a}</code>
Ạ̇	<code>\textadvancing{A}\textadvancing{a}</code>
Ȧ̤	<code>\textbottomtiebar{A}\textbottomtiebar{a}</code>
Ḁ̇	<code>\textbreve{A}\textbreve{a}</code>
Ȧ̧	<code>\textcircumacute{A}\textcircumacute{a}</code>
Ą̇	<code>\textcircumdot{A}\textcircumdot{a}</code>

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$\text{Áá}$  `\textdotacute{A}\textdotacute{a}`  
 $\text{Ăă}$  `\textdotbreve{A}\textdotbreve{a}`  
 $\text{Ää}$  `\textdoublegrave{A}\textdoublegrave{a}`  
 $\text{Åå}$  `\textdoublevbaraccent{A}\textdoublevbaraccent{a}`  
 $\text{Ȧȧ}$  `\textfallrise{A}\textfallrise{a}`  
 $\text{Ăă}$  `\textgravecircum{A}\textgravecircum{a}`  
 $\text{Ăă}$  `\textgravedot{A}\textgravedot{a}`  
 $\text{Ăă}$  `\textgravemacron{A}\textgravemacron{a}`  
 $\text{Ăă}$  `\textgravemid{A}\textgravemid{a}`  
 $\text{Ăă}$  `\texthighrise{A}\texthighrise{a}`  
 $\text{A̲a}$  `\textinvsubbridge{A}\textinvsubbridge{a}`  
 $\text{Ạa}$  `\textlowering{A}\textlowering{a}`  
 $\text{Ăă}$  `\textlowrise{A}\textlowrise{a}`  
 $\text{Ăă}$  `\textmidacute{A}\textmidacute{a}`  
 $\text{Ăă}$  `\textovercross{A}\textovercross{a}`  
 $\text{Ăă}$  `\textoverw{A}\textoverw{a}`  
 $\text{Ạa}$  `\textpolhook{A}\textpolhook{a}`  
 $\text{Ạa}$  `\textraising{A}\textraising{a}`  
 $\text{Ạa}$  `\textretracting{A}\textretracting{a}`  
 $\text{Ăă}$  `\textringmacron{A}\textringmacron{a}`  
 $\text{Ăă}$  `\textrisefall{A}\textrisefall{a}`  
 $\text{Ăă}$  `\textroundcap{A}\textroundcap{a}`  
 $\text{A̲a}$  `\textseagull{A}\textseagull{a}`  
 $\text{Ạa}$  `\textsubacute{A}\textsubacute{a}`  
 $\text{Ạa}$  `\textsubarch{A}\textsubarch{a}`  
 $\text{Ạa}$  `\textsubbar{A}\textsubbar{a}`  
 $\text{Ạa}$  `\textsubbridge{A}\textsubbridge{a}`  
 $\text{Ạa}$  `\textsubcircum{A}\textsubcircum{a}`  
 $\text{Ạa}$  `\textsubdot{A}\textsubdot{a}`  
 $\text{Ạa}$  `\textsubgrave{A}\textsubgrave{a}`  
 $\text{Ạa}$  `\textsublhalfring{A}\textsublhalfring{a}`  
 $\text{Ạa}$  `\textsubplus{A}\textsubplus{a}`  
 $\text{Ạa}$  `\textsubrhalfring{A}\textsubrhalfring{a}`  
 $\text{Ạa}$  `\textsubring{A}\textsubring{a}`  
 $\text{Ạa}$  `\textsubsquare{A}\textsubsquare{a}`  
 $\text{Ạa}$  `\textsubtilde{A}\textsubtilde{a}`

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$\text{\AA}$	$\text{\textsubumlaut{A}}\text{\textsubumlaut{a}}$
$\text{\Aa}$	$\text{\textsubw{A}}\text{\textsubw{a}}$
$\text{\AA}$	$\text{\textsubwedge{A}}\text{\textsubwedge{a}}$
$\text{\AA}$	$\text{\textsuperimposetilde{A}}\text{\textsuperimposetilde{a}}$
$\text{\AA}$	$\text{\textsyllabic{A}}\text{\textsyllabic{a}}$
$\text{\AA}$	$\text{\texttildedot{A}}\text{\texttildedot{a}}$
$\text{\AA}$	$\text{\texttoptiebar{A}}\text{\texttoptiebar{a}}$
$\text{\AA}$	$\text{\textvbaraccent{A}}\text{\textvbaraccent{a}}$

tipa defines shortcut sequences for many of the above. See the tipa documentation for more information.

TABLE 21: extraipa Text-mode Accents

$\text{\AA}$	$\text{\bibridge{A}}\text{\bibridge{a}}$	$\text{\AA}$	$\text{\partvoiceless{A}}\text{\partvoiceless{a}}$
$\text{\AA}$	$\text{\crtilde{A}}\text{\crtilde{a}}$	$\text{\AA}$	$\text{\sliding{A}}\text{\sliding{a}}$
$\text{\AA}$	$\text{\dottedtilde{A}}\text{\dottedtilde{a}}$	$\text{\AA}$	$\text{\spreadlips{A}}\text{\spreadlips{a}}$
$\text{\AA}$	$\text{\doubletilde{A}}\text{\doubletilde{a}}$	$\text{\AA}$	$\text{\subcorner{A}}\text{\subcorner{a}}$
$\text{\AA}$	$\text{\finpartvoice{A}}\text{\finpartvoice{a}}$	$\text{\AA}$	$\text{\subdoublebar{A}}\text{\subdoublebar{a}}$
$\text{\AA}$	$\text{\finpartvoiceless{A}}\text{\finpartvoiceless{a}}$	$\text{\AA}$	$\text{\subdoublevert{A}}\text{\subdoublevert{a}}$
$\text{\AA}$	$\text{\inipartvoice{A}}\text{\inipartvoice{a}}$	$\text{\AA}$	$\text{\sublptr{A}}\text{\sublptr{a}}$
$\text{\AA}$	$\text{\inipartvoiceless{A}}\text{\inipartvoiceless{a}}$	$\text{\AA}$	$\text{\subrprr{A}}\text{\subrprr{a}}$
$\text{\AA}$	$\text{\overbridge{A}}\text{\overbridge{a}}$	$\text{\AA}$	$\text{\whistle{A}}\text{\whistle{a}}$
$\text{\AA}$	$\text{\partvoice{A}}\text{\partvoice{a}}$		

TABLE 22: wsuipa Text-mode Accents

$\text{\AA}$	$\text{\dental{A}}\text{\dental{a}}$
$\text{\AA}$	$\text{\underarch{A}}\text{\underarch{a}}$

TABLE 23: phonetic Text-mode Accents

$\underset{\cdot}{A}\underset{\cdot}{a}$	<code>\hill{A}\hill{a}</code>	$\underset{\cdot}{A}\underset{\cdot}{a}$	<code>\rc{A}\rc{a}</code>	$\underset{\cdot}{A}\underset{\cdot}{a}$	<code>\ut{A}\ut{a}</code>
$\underset{\cdot}{A}\underset{\cdot}{a}$	<code>\od{A}\od{a}</code>	$\underset{\cdot}{A}\underset{\cdot}{a}$	<code>\syl{A}\syl{a}</code>		
$\overset{\cdot}{A}\overset{\cdot}{a}$	<code>\ohill{A}\ohill{a}</code>	$\underset{\cdot}{A}\underset{\cdot}{a}$	<code>\td{A}\td{a}</code>		

The `phonetic` package provides a few additional macros for linguistic accents. `\acbar` and `\acarc` compose characters with multiple accents; for example, `\acbar{\'}{a}` produces “ $\overset{\cdot}{\underset{\cdot}{a}}$ ” and `\acarc{\"}{e}` produces “ $\overset{\cdot}{\underset{\cdot}{e}}$ ”. `\labvel` joins two characters with an arc: `\labvel{m}` → “ $\overline{m}$ ”. `\upbar` is intended to go between characters as in “ $x\overline{y}$ ” → “ $x'y$ ”. Lastly, `\uplett` behaves like `\textsuperscript` but uses a smaller font. Contrast “ $p\uplett{h}$ ” → “ $p^h$ ” with “ $p\textsuperscript{h}$ ” → “ $p^h$ ”.

TABLE 24: metre Text-mode Accents

$\acute{A}\acute{a}$	<code>\acutus{A}\acutus{a}</code>
$\breve{A}\breve{a}$	<code>\breve{A}\breve{a}</code>
$\tilde{A}\tilde{a}$	<code>\circumflexus{A}\circumflexus{a}</code>
$\ddot{A}\ddot{a}$	<code>\diaeresis{A}\diaeresis{a}</code>
$\grave{A}\grave{a}$	<code>\gravis{A}\gravis{a}</code>
$\bar{A}\bar{a}$	<code>\macron{A}\macron{a}</code>

TABLE 25: t4phonet Text-mode Accents

$\text{\AA}\text{\AA}$	<code>\textdoublegrave{A}\textdoublegrave{a}</code>
$\text{\A}\text{\A}$	<code>\textvbaraccent{A}\textvbaraccent{a}</code>
$\text{\AA}\text{\AA}$	<code>\textdoublevbaraccent{A}\textdoublevbaraccent{a}</code>

The idea behind the `t4phonet` package’s text-mode accents is to provide an interface to some of the accents in the T4 font encoding (accents marked with “ $\ddagger$ ” in Table 19 on the next page) but using the same names as the `tipa` accents presented in Table 20 on page 26.

TABLE 26: arcs Text-mode Accents

$$\widehat{A}\widehat{a} \quad \backslash\overarc{A}\overarc{a} \quad \underline{A}\underline{a} \quad \backslash\underarc{A}\underarc{a}$$

The accents shown above scale only to a few characters wide. An optional macro argument alters the effective width of the accented characters. See the arcs documentation for more information.

At the time of this writing (2015/11/12), there exists an incompatibility between the arcs package and the relsize package, upon which arcs depends. As a workaround, one should apply the patch proposed by Michael Sharpe on the X<sub>Y</sub>TeX mailing list (Subject: “The arcs package”, dated 2013/08/25) to prevent spurious text from being added to the document (as in, “5.0pt $\widehat{A}$ ” when “ $\widehat{A}$ ” is expected).

TABLE 27: semtrans Accents

$$\dot{A}\dot{a} \quad \backslash\mathit{D}\{A\}\mathit{D}\{a\} \quad \mathring{A}\mathring{a} \quad \backslash\mathit{U}\{A\}\mathit{U}\{a\}$$

$$\mathit{V}\mathit{e} \quad \backslash\mathit{T}\{A\}\mathit{T}\{a\}^*$$

\*  $\mathit{T}$  is not actually an accent but a command that rotates its argument 180° using the graphicx package’s  $\mathit{rotatebox}$  command.

TABLE 28: ogonek Accents

$$\mathring{A}\mathring{a} \quad \backslash\mathit{k}\{A\}\mathit{k}\{a\}$$

TABLE 29: combelow Accents

$$\mathring{A}\mathring{a} \quad \backslash\mathit{cb}\{A\}\mathit{cb}\{a\}$$

$\mathit{cb}$  places a comma *above* letters with descenders. Hence, while “ $\mathit{cb}\{s\}$ ” produces “š”, “ $\mathit{cb}\{g\}$ ” produces “ġ”.



TABLE 30: wsuipa Diacritics

ˆ	<code>\ain</code>	<	<code>\leftp</code>	◊	<code>\overring</code>	ˈ	<code>\stress</code>	˘	<code>\underwedge</code>
⌈	<code>\corner</code>	←	<code>\leftt</code>	◌	<code>\polishhook</code>	ˌ	<code>\syllabic</code>	ˆ	<code>\upp</code>
˘	<code>\downp</code>	:	<code>\length</code>	>	<code>\rightp</code>	..	<code>\underdots</code>	⌊	<code>\upt</code>
⌋	<code>\downt</code>	~	<code>\midtilde</code>	↵	<code>\rightt</code>	◊	<code>\underring</code>		
˘	<code>\halflength</code>	◌	<code>\open</code>	ˌ	<code>\secstress</code>	˘	<code>\undertilde</code>		

The `wsuipa` package defines all of the above as ordinary characters, not as accents. However, it does provide `\diatop` and `\diaunder` commands, which are used to compose diacritics with other characters. For example, `\diatop[\overring|a]` produces “ $\overset{\circ}{a}$ ”, and `\diaunder[\underdots|a]` produces “ $\underset{..}{a}$ ”. See the `wsuipa` documentation for more information.

TABLE 31: textcomp Diacritics

ˆ	<code>\textacutedbl</code>	ˇ	<code>\textasciicaron</code>	ˉ	<code>\textasciimacron</code>
˘	<code>\textasciiacute</code>	¨	<code>\textasciidieresis</code>	ˆ	<code>\textgravedbl</code>
˘	<code>\textasciibreve</code>	˘	<code>\textasciigrave</code>		

The `textcomp` package defines all of the above as ordinary characters, not as accents. You can use `\llap` or `\rlap` to combine them with other characters. See the discussion of `\llap` and `\rlap` on page 372 for more information.

TABLE 32: marvosym Diacritics

→	<code>\arrowOver</code>	—	<code>\barOver</code>	/	<code>\StrikingThrough</code>
→	<code>\ArrowOver</code>	—	<code>\BarOver</code>		

The `marvosym` package defines all of the above as ordinary characters, not as accents. You can use `\llap` or `\rlap` to combine them with other characters. See the discussion of `\llap` and `\rlap` on page 372 for more information.

TABLE 33: textcomp Currency Symbols

B	<code>\textbaht</code>	\$	<code>\textdollar*</code>	G	<code>\textguarani</code>	₩	<code>\textwon</code>
¢	<code>\textcent</code>	\$	<code>\textdollaroldstyle</code>	£	<code>\textlira</code>	¥	<code>\textyen</code>
¢	<code>\textcentoldstyle</code>	₫	<code>\textdong</code>	₮	<code>\textnaira</code>		
₯	<code>\textcolonmonetary</code>	€	<code>\texteuro</code>	P	<code>\textpeso</code>		
₧	<code>\textcurrency</code>	f	<code>\textflorin</code>	£	<code>\textsterling*</code>		

\* It’s generally preferable to use the corresponding symbol from Table 3 on page 19 because the symbols in that table work properly in both text mode and math mode.

TABLE 34: marvosym Currency Symbols

₴	<code>\Denarius</code>	€	<code>\EURcr</code>	€	<code>\EURtm</code>	₤	<code>\Pfund</code>
€	<code>\Ecommerce</code>	€	<code>\EURdig</code>	\$	<code>\EyesDollar</code>	β	<code>\Shilling</code>
€	<code>\EUR</code>	€	<code>\EURhv</code>	ƒ	<code>\Florin</code>		

The different euro signs are meant to be visually compatible with different fonts—Courier (`\EURcr`), Helvetica (`\EURhv`), Times Roman (`\EURtm`), and the `marvosym` digits listed in Table 320 (`\EURdig`). The `mathdesign` package redefines `\texteuro` to be visually compatible with one of three additional fonts: Utopia (€), Charter (€), or Garamond (€).

TABLE 35: fontawesome5 Currency Symbols

₿	<code>\faBtc</code>	₺	<code>\faLiraSign</code>	₪	<code>\faShekelSign</code>	¥	<code>\faYenSign</code>
\$	<code>\faDollarSign</code>	£	<code>\faPoundSign</code>	₮	<code>\faTenge</code>		
€	<code>\faEuroSign</code>	₽	<code>\faRubleSign</code>	₪	<code>\faViacoin</code>		
₴	<code>\faHryvnia</code>	₹	<code>\faRupeeSign</code>	₩	<code>\faWonSign</code>		

TABLE 36: wasysym Currency Symbols

¢	<code>\cent</code>	¤	<code>\currency</code>	€	<code>\wasyeuro*</code>
---	--------------------	---	------------------------	---	-------------------------

\* `\wasyeuro` is also available as `\euro` unless you specify the `noeuro` package option.

TABLE 37: GpA2e Currency Symbols

€	<code>\Euro</code>	£	<code>\Pound</code>
---	--------------------	---	---------------------

TABLE 38: teubner Currency Symbols

×	<code>\denarius</code>	c	<code>\hemiobelion</code>	⊃	<code>\tetartemorion</code>
†	<code>\dracma</code>	₰	<code>\stater</code>		

TABLE 39: tfrupee Currency Symbols

₹	<code>\rupee</code>
---	---------------------

TABLE 40: eurosym Euro Signs

€ \geneuro € \geneuronarrow € \geneurowide € \officialeguro

\euro is automatically mapped to one of the above—by default, \officialeguro—based on a eurosym package option. See the eurosym documentation for more information. The \geneuro... characters are generated from the current body font’s “C” character and therefore may not appear exactly as shown.

TABLE 41: fourier Euro Signs

€ \eurologo € \texteuro

TABLE 42: textcomp Legal Symbols

⒫ \textcircledP Ⓒ Ⓒ \textcopyright ™ \textservicemark  
 Ⓓ \textcopyleft Ⓓ Ⓓ \textregistered ™ ™ \texttrademark






The first symbol column represents the—sometimes “faked”—symbol that L<sup>A</sup>T<sub>E</sub>X<sub>2<sub>ε</sub></sub> provides by default. The second symbol column represents the symbol as redefined by textcomp. The textcomp package is generally required to typeset Table 42’s symbols in italic.

See <http://www.texfaq.org/FAQ-tradesyms.html> for solutions to common problems that occur when using these symbols (e.g., getting a “⒫” when you expected to get a “Ⓓ”).

TABLE 43: fontawesome5 Legal Symbols














©	\faCopyright	♻️	\faCreativeCommonsRemix
©	\faCopyright[regular]	Ⓢ	\faCreativeCommonsSa
cc	\faCreativeCommons	♻️	\faCreativeCommonsSampling
👤	\faCreativeCommonsBy	♻️+	\faCreativeCommonsSamplingPlus
🌐	\faCreativeCommonsNc	♻️	\faCreativeCommonsShare
🌐	\faCreativeCommonsNcEu	0	\faCreativeCommonsZero
🌐	\faCreativeCommonsNcJp	®	\faRegistered
🌐	\faCreativeCommonsNd	®	\faRegistered[regular]
Ⓟ	\faCreativeCommonsPd*	™	\faTrademark
🌐	\faCreativeCommonsPd		

TABLE 44: ccllicenses Creative Commons License Icons

	<code>\cc</code>		<code>\ccnc*</code>		<code>\ccsa*</code>
	<code>\ccb</code>		<code>\ccnd</code>		

\* These symbols utilize the `rotating` package and therefore display improperly in some DVI viewers.

TABLE 45: ccicons Creative Commons License Icons

	<code>\ccAttribution</code>		<code>\ccNonCommercialEU</code>		<code>\ccShare</code>
	<code>\ccCopy</code>		<code>\ccNonCommercialJP</code>		<code>\ccShareAlike</code>
	<code>\ccLogo</code>		<code>\ccPublicDomain</code>		<code>\ccZero</code>
	<code>\ccNoDerivatives</code>		<code>\ccRemix</code>		
	<code>\ccNonCommercial</code>		<code>\ccSampling</code>		





`ccicons` additionally defines a set of commands for typesetting many complete Creative Commons licenses (i.e., juxtapositions of two or more of the preceding icons). For example, the `\ccbyncnd` command typesets the “Attribution–Noncommercial–No Derivative Works” license (“   ”). See the `ccicons` documentation for more information.

TABLE 46: textcomp Old-style Numerals

0	<code>\textzerooldstyle</code>	4	<code>\textfouroldstyle</code>	8	<code>\texteightoldstyle</code>
1	<code>\textoneoldstyle</code>	5	<code>\textfiveoldstyle</code>	9	<code>\textnineoldstyle</code>
2	<code>\texttwooldstyle</code>	6	<code>\textsixoldstyle</code>		
3	<code>\textthreeoldstyle</code>	7	<code>\textsevenoldstyle</code>		

Rather than use the bulky `\textoneoldstyle`, `\texttwooldstyle`, etc. commands shown above, consider using `\oldstylenums{...}` to typeset an old-style number.

TABLE 47: Miscellaneous textcomp Symbols

<code>\b</code>	<code>\textblank</code>	<code>\P</code>	<code>\textpilcrow</code>
<code> </code>	<code>\textbrokenbar</code>	<code>'</code>	<code>\textquotesingle</code>
<code>=</code>	<code>\textdblhyphen</code>	<code>,</code>	<code>\textquotestraightbase</code>
<code>=</code>	<code>\textdblhyphenchar</code>	<code>„</code>	<code>\textquotestraightdblbase</code>
<code>%</code>	<code>\textdiscount</code>	<code>R</code>	<code>\textrecipe</code>
<code>€</code>	<code>\textestimated</code>	<code>*</code>	<code>\textreferencemark</code>
<code>‡</code>	<code>\textinterrobang</code>	<code>—</code>	<code>\textthreequartersemdash</code>
<code>‡</code>	<code>\textinterrobangdown</code>	<code>~</code>	<code>\texttildelow</code>
<code>N<sup>o</sup></code>	<code>\textnumero</code>	<code>—</code>	<code>\texttwelveudash</code>
<code>o</code>	<code>\textopenbullet</code>		

TABLE 48: Miscellaneous `wasysym` Text-mode Symbols

f	<code>\longs</code>	% <sub>00</sub>	<code>\permil</code>	§	<code>\wasyparagraph</code> *
---	---------------------	-----------------	----------------------	---	-------------------------------

\* `wasysym` defines `\Paragraph` as a synonym for `\wasyparagraph`.

## Chapter 3

# Mathematical symbols

Most, but not all, of the symbols in this chapter are math-mode only. That is, they yield a “Missing \$ inserted” error message if not used within `$. . $`, `\[. . \]`, or another math-mode environment. Operators marked as “variable-sized” are taller in displayed formulas, shorter in in-text formulas, and possibly shorter still when used in various levels of superscripts or subscripts.

Alphanumeric symbols (e.g., “ $\mathcal{L}$ ” and “ $\mathbb{Z}$ ”) are usually produced using one of the math alphabets in Table 348 rather than with an explicit symbol command. Look there first if you need a symbol for a transform, number set, or some other alphanumeric.

Although there have been many requests on `comp.text.tex` for a contradiction symbol, the ensuing discussion invariably reveals innumerable ways to represent contradiction in a proof, including “ $\blitz$ ” (`\blitza`), “ $\Rightarrow\Leftarrow$ ” (`\Rightarrow\Leftarrow`), “ $\perp$ ” (`\bot`), “ $\Leftrightarrow$ ” (`\nletrightarrow`), and “ $\ast$ ” (`\textreferencemark`). Because of the lack of notational consensus, it is probably better to spell out “Contradiction!” than to use a symbol for this purpose. Similarly, discussions on `comp.text.tex` have revealed that there are a variety of ways to indicate the mathematical notion of “is defined as”. Common candidates include “ $\triangleq$ ” (`\triangleq`), “ $\equiv$ ” (`\equiv`), “ $\coloneqq$ ” (*various*<sup>1</sup>), and “ $\stackrel{\text{def}}{=}$ ” (`\stackrel{\text{def}}{=}`). See also the example of `\equalsfill` on page 374. Depending upon the context, disjoint union may be represented as “ $\coprod$ ” (`\coprod`), “ $\sqcup$ ” (`\sqcup`), “ $\dot{\cup}$ ” (`\dotcup`), “ $\oplus$ ” (`\oplus`), “ $\amalg$ ” (`\amalg`), or any of a number of other symbols.<sup>2</sup> Finally, the average value of a variable  $x$  is written by some people as “ $\overline{x}$ ” (`\overline{x}`), by some people as “ $\langle x \rangle$ ” (`\langle x \rangle`), and by some people as “ $\emptyset x$ ” or “ $\varnothing x$ ” (`\diameter x` or `\varnothing x`). The moral of the story is that you should be careful always to explain your notation to avoid confusing your readers.

TABLE 49: Math-mode Versions of Text Symbols

<code>\$</code>	<code>\mathdollar</code>	<code>¶</code>	<code>\mathparagraph</code>	<code>£</code>	<code>\mathsterling</code>
<code>...</code>	<code>\mathellipsis</code>	<code>§</code>	<code>\mathsection</code>	<code>-</code>	<code>\mathunderscore</code>

It’s generally preferable to use the corresponding symbol from Table 3 on page 19 because the symbols in that table work properly in both text mode and math mode.

<sup>1</sup>In `txfonts`, `pxfonts`, and `mathtools` the symbol is called `\coloneqq`. In `mathabx` and `MnSymbol` it’s called `\coloneq`. In `colonequals` it’s called `\colonequals`.

<sup>2</sup>Bob Tennent listed these and other disjoint-union symbol possibilities in a November 2007 post to `comp.text.tex`.

TABLE 50: logix Math-mode Versions of Text Symbols

&	\AAnd	†	\Dagger	\	\LeftSlash	'	\SingleQuote
&	\Ampersand	‡	\Daggerr		\LngVrtBar	~	\Tild
`	\BackQuote	††	\Ddagger	#	\Numbr	'''	\TripleQuote
	\BndBar	‡‡	\Ddaggerr	%	\Percnt	_	\Underscore
^	\Circumflex	\$	\Dollar	?	\Queston		
,	\Coma	"	\DoubleQuote	/	\RightSlash		
©	\Cpyrght	!	\Exclaim	;	\Semicln		

logix requires either Lua $\LaTeX$  or X $\LaTeX$ .

TABLE 51: logix Basic Operators

*	\Asterick	⊕	\CircMinusPlus	÷	\Divd	-	\Minus
⊛	\CircAsterick	⊕	\CircPls	/	\Divide	∓	\MinusPlus
⊘	\CircDivd	⊕	\CircPlusMinus	÷	\DMinus	+	\Pls
⊘	\CircDivide	⊗	\CircTimes	+	\DPlus	±	\PlusMinus
⊖	\CircMinus	*	\DAsterisk	*	\DTimes	*	\Times

logix requires either Lua $\LaTeX$  or X $\LaTeX$ .

TABLE 52: cml1 Unary Operators

!	\oc*	↑	\shneg	?	\wn*
↓	\shift	↓	\shpos		

\* \oc and \wn differ from “!” and “?” in terms of their math-mode spacing:  $\$A=!B\$$  produces “ $A =!B$ ”, for example, while  $\$A=\oc B\$$  produces “ $A = !B$ ”.

TABLE 53: Binary Operators

∩	\amalg	∪	\cup	⊕	\oplus	×	\times
*	\ast	†	\dagger	⊘	\oslash	◁	\triangleleft
○	\bigcirc	‡	\ddagger	⊗	\otimes	▷	\triangleright
▽	\bigtriangledown	◇	\diamond	±	\pm	◁	\unlhd*
△	\bigtriangleup	÷	\div	▷	\rhd*	▷	\unrhd*
•	\bullet	◁	\lhd*	\	\setminus	⊕	\uplus
∩	\cap	∓	\mp	∩	\sqcap	∨	\vee
·	\cdot	⊙	\odot	∩	\sqcup	∧	\wedge
○	\circ	⊖	\ominus	*	\star	∩	\wr

\* Not predefined by the  $\LaTeX 2_{\epsilon}$  core. Use the latexsym package to expose this symbol.

TABLE 54:  $\mathcal{AMS}$  Binary Operators

$\bar{\wedge}$	<code>\barwedge</code>	$\odot$	<code>\circledcirc</code>	$\intercal$	<code>\intercal*</code>
$\boxdot$	<code>\boxdot</code>	$\ominus$	<code>\circleddash</code>	$\lambda$	<code>\leftthreetimes</code>
$\boxminus$	<code>\boxminus</code>	$\cup$	<code>\Cup</code>	$\ltimes$	<code>\ltimes</code>
$\boxplus$	<code>\boxplus</code>	$\curlyvee$	<code>\curlyvee</code>	$\rtimes$	<code>\rightthreetimes</code>
$\boxtimes$	<code>\boxtimes</code>	$\curlywedge$	<code>\curlywedge</code>	$\times$	<code>\rtimes</code>
$\Cap$	<code>\Cap</code>	$\div$	<code>\divideontimes</code>	$\smallsetminus$	<code>\smallsetminus</code>
$\centerdot$	<code>\centerdot</code>	$\dotplus$	<code>\dotplus</code>	$\veebar$	<code>\veebar</code>
$\circledast$	<code>\circledast</code>	$\overline{\wedge}$	<code>\doublebarwedge</code>		

\* Some people use a superscripted `\intercal` for matrix transpose: “ $A^{\intercal}$ ”  $\mapsto$  “ $A^T$ ”. (See the May 2009 `comp.text.tex` thread, “raising math symbols”, for suggestions about altering the height of the superscript.) `\top` (Table 223 on page 123), `T`, and `\mathsf{T}` are other popular choices: “ $A^T$ ”, “ $A^T$ ”, “ $A^T$ ”.

TABLE 55: `stmaryrd` Binary Operators

$\phi$	<code>\baro</code>	$\parallel$	<code>\interleave</code>	$\otimes$	<code>\varoast</code>
$\backslash$	<code>\bbslash</code>	$\triangleleft$	<code>\leftslice</code>	$\varnothing$	<code>\varobar</code>
$\&$	<code>\binampersand</code>	$\M$	<code>\merge</code>	$\oslash$	<code>\varobslash</code>
$\wp$	<code>\bindnasrepma</code>	$\ominus$	<code>\minuso</code>	$\odot$	<code>\varocircle</code>
$\boxast$	<code>\boxast</code>	$\pm$	<code>\moo</code>	$\odot$	<code>\varodot</code>
$\boxbar$	<code>\boxbar</code>	$\oplus$	<code>\nplus</code>	$\otimes$	<code>\varogreaterthan</code>
$\boxbox$	<code>\boxbox</code>	$\oslash$	<code>\obar</code>	$\otimes$	<code>\varolessthan</code>
$\boxbslash$	<code>\boxbslash</code>	$\square$	<code>\oblong</code>	$\ominus$	<code>\varominus</code>
$\boxcircle$	<code>\boxcircle</code>	$\oslash$	<code>\obslash</code>	$\oplus$	<code>\varoplus</code>
$\boxdot$	<code>\boxdot</code>	$\otimes$	<code>\ogreaterthan</code>	$\oslash$	<code>\varoslash</code>
$\boxempty$	<code>\boxempty</code>	$\otimes$	<code>\olessthan</code>	$\otimes$	<code>\varotimes</code>
$\boxslash$	<code>\boxslash</code>	$\oslash$	<code>\ovee</code>	$\oslash$	<code>\varovee</code>
$\curlyveedownarrow$	<code>\curlyveedownarrow</code>	$\oslash$	<code>\owedge</code>	$\oslash$	<code>\varowedge</code>
$\curlyveeuparrow$	<code>\curlyveeuparrow</code>	$\triangleright$	<code>\rightslice</code>	$\times$	<code>\vartimes</code>
$\curlywedgedownarrow$	<code>\curlywedgedownarrow</code>	$\//$	<code>\sslash</code>	$\Uparrow$	<code>\Ydown</code>
$\curlywedgeuparrow$	<code>\curlywedgeuparrow</code>	$\parallel$	<code>\talloblong</code>	$\leftarrow$	<code>\Yleft</code>
$\fatbslash$	<code>\fatbslash</code>	$\bigcirc$	<code>\varbigcirc</code>	$\rightarrow$	<code>\Yright</code>
$\fatsemi$	<code>\fatsemi</code>	$\curlyvee$	<code>\varcurlyvee</code>	$\Uparrow$	<code>\Yup</code>
$\fatslash$	<code>\fatslash</code>	$\curlywedge$	<code>\varcurlywedge</code>		

TABLE 56: `wasysym` Binary Operators

$\triangleleft$	<code>\lhd</code>	$\bigcirc$	<code>\ocircle</code>	$\blacktriangleright$	<code>\RHD</code>	$\triangleright$	<code>\unrhd</code>
$\blacktriangleleft$	<code>\LHD</code>	$\triangleright$	<code>\rhd</code>	$\triangleleft$	<code>\unlhd</code>		



TABLE 57: txfonts/pxfonts Binary Operators

⊖	<code>\circledbar</code>	⊗	<code>\circledwedge</code>	○	<code>\medcirc</code>
⊘	<code>\circledbslash</code>	⌘	<code>\invamp</code>	⊕	<code>\sqcapplus</code>
⊖	<code>\circledvee</code>	●	<code>\medbullet</code>	⊔	<code>\sqcupplus</code>

TABLE 58: mathabx Binary Operators

*	<code>\ast</code>	^	<code>\curlywedge</code>	□	<code>\sqcap</code>
*	<code>\Asterisk</code>	÷	<code>\divdot</code>	⊔	<code>\sqcup</code>
⌘	<code>\barwedge</code>	*	<code>\divideontimes</code>	⊔	<code>\sqdoublecap</code>
★	<code>\bigstar</code>	÷	<code>\dotdiv</code>	⊔	<code>\sqdoublecup</code>
★	<code>\bigvarstar</code>	+	<code>\dotplus</code>	□	<code>\square</code>
◆	<code>\blackdiamond</code>	×	<code>\dottimes</code>	⊔	<code>\squplus</code>
∩	<code>\cap</code>	⌘	<code>\doublebarwedge</code>	·	<code>\udot</code>
⊕	<code>\circplus</code>	⊔	<code>\doublecap</code>	⊕	<code>\uplus</code>
*	<code>\coasterisk</code>	⊔	<code>\doublecup</code>	*	<code>\varstar</code>
*	<code>\coAsterisk</code>	×	<code>\ltimes</code>	∨	<code>\vee</code>
*	<code>\convolution</code>	⊕	<code>\pluscirc</code>	∨	<code>\veebar</code>
∪	<code>\cup</code>	×	<code>\rtimes</code>	∨	<code>\veedoublebar</code>
∨	<code>\curlyvee</code>	■	<code>\sqbullet</code>	^	<code>\wedge</code>

Many of the preceding glyphs go by multiple names. `\centerdot` is equivalent to `\sqbullet`, and `\ast` is equivalent to `*`. `\asterisk` produces the same glyph as `\ast`, but as an ordinary symbol, not a binary operator. Similarly, `\bigast` produces a large-operator version of the `\Asterisk` binary operator, and `\bigcoast` produces a large-operator version of the `\coAsterisk` binary operator.

TABLE 59: MnSymbol Binary Operators

⊔	<code>\amalg</code>	⊔	<code>\doublesqcup</code>	∴	<code>\righttherefore</code>
*	<code>\ast</code>	∞	<code>\doublevee</code>	×	<code>\rightthreetimes</code>
×	<code>\backslashdiv</code>	⌘	<code>\doublewedge</code>	⌘	<code>\rightY</code>
⌘	<code>\bowtie</code>	∴	<code>\downtherefore</code>	×	<code>\rtimes</code>
●	<code>\bullet</code>	∨	<code>\downY</code>	÷	<code>\slashdiv</code>
∩	<code>\cap</code>	×	<code>\dtimes</code>	∏	<code>\smallprod</code>
⊔	<code>\capdot</code>	∴	<code>\fivedots</code>	□	<code>\sqcap</code>
⊕	<code>\capplus</code>	∞	<code>\hbipropto</code>	⊔	<code>\sqcapdot</code>
·	<code>\cdot</code>	∴	<code>\hdotdot</code>	⊕	<code>\sqcapplus</code>
○	<code>\circ</code>	⊔	<code>\lefthalfcap</code>	⊔	<code>\sqcup</code>

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$\curlyvee$	<code>\closedcurlyvee</code>	$\leftthalfcup$	<code>\lefthalfcup</code>	$\sqcup\dot$	<code>\sqcupdot</code>
$\closedcurlywedge$	<code>\closedcurlywedge</code>	$\lefttherefore$	<code>\lefttherefore</code>	$\sqcupplus$	<code>\sqcupplus</code>
$\cup$	<code>\cup</code>	$\leftthreetimes$	<code>\leftthreetimes</code>	$\squaredots$	<code>\squaredots</code>
$\cup\dot$	<code>\cupdot</code>	$\leftY$	<code>\leftY</code>	$\times$	<code>\times</code>
$\cupplus$	<code>\cupplus</code>	$\ltimes$	<code>\ltimes</code>	$\cdot\cdot$	<code>\udotdot</code>
$\curlyvee$	<code>\curlyvee</code>	$\medbackslash$	<code>\medbackslash</code>	$\cdot\cdot$	<code>\uptherefore</code>
$\curlyvee\dot$	<code>\curlyvee\dot</code>	$\medcircle$	<code>\medcircle</code>	$\upY$	<code>\upY</code>
$\curlywedge$	<code>\curlywedge</code>	$\medslash$	<code>\medslash</code>	$\utimes$	<code>\utimes</code>
$\curlywedgedot$	<code>\curlywedgedot</code>	$\medvert$	<code>\medvert</code>	$\vbipto$	<code>\vbipto</code>
$\ddot\cdot$	<code>\ddotdot</code>	$\medvert\dot$	<code>\medvert\dot</code>	$\vd\dot\cdot$	<code>\vdotdot</code>
$\diamond\cdot\cdot$	<code>\diamonddots</code>	$\minus$	<code>\minus</code>	$\vee$	<code>\vee</code>
$\div$	<code>\div</code>	$\minus\dot$	<code>\minusdot</code>	$\vee\dot$	<code>\vee\dot</code>
$\dot\cdot\medvert$	<code>\dotmedvert</code>	$\mp$	<code>\mp</code>	$\vert\bowtie$	<code>\vertbowtie</code>
$\dot\cdot\minus$	<code>\dotminus</code>	$\neswbipropto$	<code>\neswbipropto</code>	$\vert\div$	<code>\vertdiv</code>
$\doublecap$	<code>\doublecap</code>	$\nwsebipropto$	<code>\nwsebipropto</code>	$\wedge$	<code>\wedge</code>
$\doublecup$	<code>\doublecup</code>	$\plus$	<code>\plus</code>	$\wedgedot$	<code>\wedgedot</code>
$\doublecurlyvee$	<code>\doublecurlyvee</code>	$\pm$	<code>\pm</code>	$\wreath$	<code>\wreath</code>
$\doublecurlywedge$	<code>\doublecurlywedge</code>	$\rightthalfcap$	<code>\rightthalfcap</code>		
$\doublesqcap$	<code>\doublesqcap</code>	$\rightthalfcup$	<code>\rightthalfcup</code>		

MnSymbol defines `\setminus` and `\smallsetminus` as synonyms for `\medbackslash`; `\Join` as a synonym for `\bowtie`; `\wr` as a synonym for `\wreath`; `\shortmid` as a synonym for `\medvert`; `\Cap` as a synonym for `\doublecap`; `\Cup` as a synonym for `\doublecup`; and, `\uplus` as a synonym for `\cupplus`.

TABLE 60: fdsymbol Binary Operators

$\amalg$	<code>\amalg</code>	$\doublesqcup$	<code>\doublesqcup</code>	$\rightY$	<code>\rightY</code>
$\ast$	<code>\ast</code>	$\doublevee$	<code>\doublevee</code>	$\rtimes$	<code>\rtimes</code>
$\bar{\wedge}$	<code>\barwedge</code>	$\doublewedge$	<code>\doublewedge</code>	$\setminus$	<code>\setminus</code>
$\bowtie$	<code>\bowtie</code>	$\downY$	<code>\downY</code>	$\sqcap$	<code>\sqcap</code>
$\cap$	<code>\cap</code>	$\d\cdot\cdot$	<code>\d\cdot\cdot</code>	$\sqcap\dot$	<code>\sqcap\dot</code>
$\cap\dot$	<code>\cap\dot</code>	$\cdot\cdot$	<code>\cdot\cdot</code>	$\sqcapplus$	<code>\sqcapplus</code>
$\capplus$	<code>\capplus</code>	$\intercal$	<code>\intercal</code>	$\sqcup$	<code>\sqcup</code>
$\cdot$	<code>\cdot</code>	$\int\cdot$	<code>\int\cdot</code>	$\sqcup\dot$	<code>\sqcup\dot</code>
$\cdot\cdot$	<code>\centerdot</code>	$\int\cdot\cdot$	<code>\int\cdot\cdot</code>	$\sqcupplus$	<code>\sqcupplus</code>
$\cup$	<code>\cup</code>	$\leftthreetimes$	<code>\leftthreetimes</code>	$\times$	<code>\times</code>
$\cup\dot$	<code>\cup\dot</code>	$\leftY$	<code>\leftY</code>	$\times\bar$	<code>\times\bar</code>

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$\cupplus$	$\ltimes$	$\cdot$	$\udotdot$
$\curlyvee$	$\backslash$	$\bowtie$	$\upbowtie$
$\curlywedge$	$/$	$\wedge$	$\upY$
$\ddot{\cdot}$	$-$	$\times$	$\utimes$
$\div$	$\dot{-}$	$\amalg$	$\varamalg$
$\divideontimes$	$\dot{-}$	$:$	$\vdotdot$
$/$	$\dot{-}$	$:$	$\vdots$
$\dot{-}$	$\mp$	$\vee$	$\vee$
$\dot{+}$	$+$	$\underline{\vee}$	$\veebar$
$\dot{\times}$	$\dagger$	$\vee$	$\veedot$
$\overline{\wedge}$	$\pm$	$\underline{\vee}$	$\veedoublebar$
$\overline{\cup}$	$\lrcorner$	$\wedge$	$\wedge$
$\overline{\cup}$	$\lrcorner$	$\wedge$	$\wedgedot$
$\overline{\cup}$	$\llcorner$	$\wr$	$\wreath$

fdsymbol defines  $\btimes$  as a synonym for  $\dtimes$ ;  $\Cap$  as a synonym for  $\doublecap$ ;  $\Cup$  as a synonym for  $\doublecup$ ;  $\hookupminus$  as a synonym for  $\intprodr$ ;  $\hourglass$  as a synonym for  $\upbowtie$ ;  $\land$  as a synonym for  $\wedge$ ;  $\lor$  as a synonym for  $\vee$ ;  $\minusshookup$  as a synonym for  $\intprod$ ;  $\smallldivslash$  as a synonym for  $\medslash$ ;  $\smallsetminus$  as a synonym for  $\medbackslash$ ;  $\Sqcap$  as a synonym for  $\doublesqcap$ ;  $\Sqcup$  as a synonym for  $\doublesqcup$ ;  $\ttimes$  as a synonym for  $\utimes$ ;  $\lJoin$  as a synonym for  $\ltimes$ ;  $\rJoin$  as a synonym for  $\rtimes$ ;  $\Join$  and  $\lrtimes$  as synonyms for  $\bowtie$ ;  $\uplus$  as a synonym for  $\cupplus$ ;  $\veeonvee$  as a synonym for  $\doublevee$ ;  $\wedgionwedge$  as a synonym for  $\doublewedge$ ; and  $\wr$  as a synonym for  $\wreath$ .

TABLE 61: boisk Binary Operators

$*$	$\ast$	$\times$	$\dottimes$	$\rtimes$	$\rtimesblack$
$\phi$	$\bar{\cup}$	$\overline{\wedge}$	$\doublebarwedge$	$\setminus$	$\smallsetminus$
$\overline{\wedge}$	$\bar{\wedge}$	$;$	$\fatsemi$	$\otimes$	$\smashtimes$
$\parallel$	$\bbslash$	$>$	$\gtrdot$	$\boxplus$	$\sqcupplus$
$\&$	$\binampersand$	$\top$	$\intercal$	$\parallel$	$\sslash$
$\wp$	$\bindnasrepma$	$\wr$	$\lbag$	$\times$	$\times$
$\blackbowtie$	$\blackbowtie$	$\blackbowtie$	$\lblackbowtie$	$\cupplus$	$\cupplus$
$\bowtie$	$\bowtie$	$\leftslice$	$\leftslice$	$\cap$	$\varcap$
$\cap$	$\cap$	$\leftthreetimes$	$\leftthreetimes$	$\cup$	$\varcup$
$\Cap$	$\Cap$	$\lessdot$	$\lessdot$	$\top$	$\varintercal$

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$\cdot$	<code>\cdot</code>	$\times$	<code>\ltimes</code>	$\sqcap$	<code>\varsqcap</code>
$\cdot$	<code>\centerdot</code>	$\blacktimes$	<code>\ltimesblack</code>	$\sqcup$	<code>\varsqcup</code>
$\dagger$	<code>\circplus</code>	$\pitchfork$	<code>\merge</code>	$\times$	<code>\vartimes</code>
$*$	<code>\coAsterisk</code>	$\ominus$	<code>\minuso</code>	$\vee$	<code>\vee</code>
$*$	<code>\convolution</code>	$\pm$	<code>\moo</code>	$\veebar$	<code>\Vee</code>
$\cup$	<code>\cup</code>	$\mp$	<code>\mp</code>	$\veebar$	<code>\veebar</code>
$\cup$	<code>\Cup</code>	$\oplus$	<code>\nplus</code>	$\vee$	<code>\veeonvee</code>
$\cup$	<code>\cupleftarrow</code>	$\oplus$	<code>\pluscirc</code>	$\wedge$	<code>\wedge</code>
$\curlyvee$	<code>\curlyvee</code>	$\oplus$	<code>\plustrif</code>	$\blackwedge$	<code>\Wedge</code>
$\curlywedge$	<code>\curlywedge</code>	$\pm$	<code>\pm</code>	$\curlywedge$	<code>\Ydown</code>
$\dagger$	<code>\dagger</code>	$\int$	<code>\rbag</code>	$\leftarrow$	<code>\Yleft</code>
$\ddagger$	<code>\ddagger</code>	$\blackbowtie$	<code>\rblackbowtie</code>	$\rightarrow$	<code>\Yright</code>
$\div$	<code>\div</code>	$\triangleright$	<code>\rightslice</code>	$\curlywedge$	<code>\Yup</code>
$\ast$	<code>\divideontimes</code>	$\blacktriangleleft$	<code>\rightthreetimes</code>		
$\dot{+}$	<code>\dotplus</code>	$\times$	<code>\rtimes</code>		

TABLE 62: stix Binary Operators

$\amalg$	<code>\amalg</code>	$\; ;$	<code>\fcmp</code>	$\sqcup$	<code>\sqcup</code>
$\ast$	<code>\ast</code>	$\; /$	<code>\fracslash</code>	$\sqcup$	<code>\Sqcup</code>
$\bar{\cap}$	<code>\barcap</code>	$\; \top$	<code>\intercal</code>	$\; //$	<code>\sslash</code>
$\bar{\cup}$	<code>\barcup</code>	$\;    $	<code>\interleave</code>	$\; :$	<code>\threedotcolon</code>
$\bar{\vee}$	<code>\barvee</code>	$\; \lrcorner$	<code>\intprod</code>	$\; \times$	<code>\times</code>
$\bar{\wedge}$	<code>\barwedge</code>	$\; \llcorner$	<code>\intprodr</code>	$\; \times$	<code>\timesbar</code>
$\bigvee$	<code>\bigvee</code>	$\; \sim$	<code>\invlazys</code>	$\; -$	<code>\tminus</code>
$\bigwedge$	<code>\bigwedge</code>	$\; \lambda$	<code>\leftthreetimes</code>	$\; +$	<code>\tplus</code>
$\times$	<code>\btimes</code>	$\; \triangleleft$	<code>\lhd</code>	$\; \#$	<code>\tripleplus</code>
$\cap$	<code>\cap</code>	$\; \times$	<code>\ltimes</code>	$\; //$	<code>\trslash</code>
$\Cap$	<code>\Cap</code>	$\; \vee$	<code>\midbarvee</code>	$\; \cap$	<code>\twocaps</code>
$\bar{\cap}$	<code>\capbarcup</code>	$\; \blackwedge$	<code>\midbarwedge</code>	$\; \cup$	<code>\twocup</code>
$\bar{\cap}$	<code>\capdot</code>	$\; \cdot$	<code>\minusdot</code>	$\; \circ$	<code>\typecolon</code>
$\bar{\cap}$	<code>\capovercup</code>	$\; \cdot$	<code>\minusdots</code>	$\; \ominus$	<code>\uminus</code>
$\bar{\cap}$	<code>\capwedge</code>	$\; \cdot$	<code>\minusrdots</code>	$\; \triangleleft$	<code>\unlhd</code>
$\bar{\cup}$	<code>\closedvarcap</code>	$\; \mp$	<code>\mp</code>	$\; \triangleright$	<code>\unrhd</code>
$\bar{\cup}$	<code>\closedvarcup</code>	$\; \#$	<code>\nhVvert</code>	$\; \updownarrow$	<code>\upand</code>
$\bar{\cup}$	<code>\closedvarcupsmashprod</code>	$\; \oplus$	<code>\opluslhrim</code>	$\; \oplus$	<code>\uplus</code>
$\bar{\cup}$	<code>\commaminus</code>	$\; \oplus$	<code>\oplusrhim</code>	$\; \bar{\wedge}$	<code>\varbarwedge</code>

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$\cup$	<code>\cup</code>	$\otimes$	<code>\otimeslhrim</code>	$\bar{\wedge}$	<code>\vardoublebarwedge</code>
$\Cup$	<code>\Cup</code>	$\otimes$	<code>\otimesrhrim</code>	$\veebar$	<code>\varveebar</code>
$\cupbarcap$	<code>\cupbarcap</code>	$\dot{+}$	<code>\plusdot</code>	$\times$	<code>\vectimes</code>
$\cupdot$	<code>\cupdot</code>	$\pm$	<code>\pluseq</code>	$\vee$	<code>\Vee</code>
$\cupleftarrow$	<code>\cupleftarrow</code>	$\hat{+}$	<code>\plushat</code>	$\vee$	<code>\vee</code>
$\cupovercap$	<code>\cupovercap</code>	$\dagger$	<code>\plussim</code>	$\veebar$	<code>\veebar</code>
$\cupvee$	<code>\cupvee</code>	$\ddagger$	<code>\plussubtwo</code>	$\vee$	<code>\veedot</code>
$\curlyvee$	<code>\curlyvee</code>	$\dagger$	<code>\plustrif</code>	$\underline{\vee}$	<code>\veedoublebar</code>
$\curlywedge$	<code>\curlywedge</code>	$\pm$	<code>\pm</code>	$\vee$	<code>\veemidvert</code>
$\dagger$	<code>\dagger</code>	$\triangleright$	<code>\rhd</code>	$\dot{\vee}$	<code>\veeodot</code>
$\ddagger$	<code>\ddagger</code>	$\llcorner$	<code>\rightthreetimes</code>	$\Wedge$	<code>\veeonvee</code>
$\div$	<code>\div</code>	$\dagger$	<code>\ringplus</code>	$\wedge$	<code>\Wedge</code>
$\divideontimes$	<code>\divideontimes</code>	$\dagger$	<code>\rsolbar</code>	$\wedge$	<code>\wedge</code>
$\dot{-}$	<code>\dotminus</code>	$\rtimes$	<code>\rtimes</code>	$\Delta$	<code>\wedgebar</code>
$\dot{+}$	<code>\dotplus</code>	$\setminus$	<code>\setminus</code>	$\Delta$	<code>\wedgedot</code>
$\dot{\times}$	<code>\dottimes</code>	$\shuf$	<code>\shuffle</code>	$\underline{\Delta}$	<code>\wedgedoublebar</code>
$\bar{\vee}$	<code>\doublebarvee</code>	$\dagger$	<code>\simplus</code>	$\Delta$	<code>\wedgemidvert</code>
$\bar{\wedge}$	<code>\doublebarwedge</code>	$\smallsetminus$	<code>\smallsetminus</code>	$\Delta$	<code>\wedgeodot</code>
$\#$	<code>\doubleplus</code>	$\ast$	<code>\smashtimes</code>	$\wedge$	<code>\wedgeonwedge</code>
$/$	<code>\dsol</code>	$\sqcap$	<code>\sqcap</code>	$\wr$	<code>\wr</code>
$\equiv$	<code>\eqqplus</code>	$\sqcap$	<code>\Sqcap</code>		

stix defines `\land` as a synonym for `\wedge`, `\lor` as a synonym for `\vee`, `\doublecap` as a synonym for `\Cap`, and `\doublecup` as a synonym for `\Cup`.

TABLE 63: mathdesign Binary Operators

$\times$	<code>\dtimes</code>	$\times$	<code>\udtimes</code>	$\times$	<code>\utimes</code>
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The `mathdesign` package additionally provides versions of each of the binary operators shown in Table 54.

TABLE 64: pdfMsym Binary Operators

$\Delta$	<code>\circwedge</code>	$\div$	<code>\divs</code>	$\div$	<code>\ndivs</code>
$\cup$	<code>\dcup</code>	$\Delta$	<code>\dwedge</code>		

`pdfMsym` symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by `pdfLATEX` and `LuaLATEX`, some by `XLLATEX`, and none by most other `TEX` backends.

TABLE 65: cml Binary Operators

 $\wp$  `\parr*`     $\&$  `\with†`

\* `cml` defines `\invamp` as a synonym for `\parr`.

† `\with` differs from `\&` in terms of its math-mode spacing: `$A \& B$` produces “ $A \& B$ ”, for example, while `$A \with B$` produces “ $A \& B$ ”.

TABLE 66: shuffle Binary Operators

 $\sqcup$  `\cshuffle`     $\sqcup$  `\shuffle`

TABLE 67: resmes Binary Operators

 $\lfloor$  `\resmes`

This symbol notates the restriction of a measure to a set, as in  $\phi \lfloor Y$ .

TABLE 68: logix Logical Operators

$\ominus$	<code>\CircInvNt</code>	$\oplus$	<code>\CircXor</code>	$\bar{\wedge}$	<code>\Nand</code>	$\nabla$	<code>\SbNd</code>
$\otimes$	<code>\CircNand</code>	$\hat{\wedge}$	<code>\Dnd</code>	$\wedge$	<code>\Nd</code>	$\bar{\vee}$	<code>\SbNor</code>
$\oslash$	<code>\CircNd</code>	$\neg$	<code>\Dnt</code>	$\sim$	<code>\Ngt</code>	$\vee$	<code>\SbOr</code>
$\oslash$	<code>\CircNgt</code>	$\dot{\vee}$	<code>\Dor</code>	$\bar{\vee}$	<code>\Nor</code>	$\underline{\vee}$	<code>\SbXor</code>
$\oslash$	<code>\CircNor</code>	$\neg$	<code>\InvNt</code>	$\neg$	<code>\Nt</code>	$ $	<code>\Shfr</code>
$\ominus$	<code>\CircNt</code>	$\uparrow$	<code>\Lnand</code>	$\vee$	<code>\Or</code>	$\underline{\vee}$	<code>\Xor</code>
$\oslash$	<code>\CircOr</code>	$\downarrow$	<code>\Lnor</code>	$\bar{\wedge}$	<code>\SbNand</code>		

logix requires either `LuaLATEX` or `XYLATEX`.

TABLE 69: ulsy Geometric Binary Operators

 $\oplus$  `\odplus`

TABLE 70: mathabx Geometric Binary Operators

▼	<code>\blacktriangledown</code>	⊠	<code>\boxright</code>	⊖	<code>\ominus</code>
◀	<code>\blacktriangleleft</code>	⊡	<code>\boxslash</code>	⊕	<code>\oplus</code>
▶	<code>\blacktriangleright</code>	⊢	<code>\boxtimes</code>	⊗	<code>\otimes</code>
▲	<code>\blacktriangleup</code>	⊣	<code>\boxtop</code>	⊘	<code>\oslash</code>
⊛	<code>\boxasterisk</code>	⊤	<code>\boxtriangleup</code>	⊗	<code>\otimes</code>
⊞	<code>\boxbackslash</code>	□	<code>\boxvoid</code>	⊕	<code>\otop</code>
⊠	<code>\boxbot</code>	⊛	<code>\oasterisk</code>	⊕	<code>\otriangleup</code>
⊡	<code>\boxcirc</code>	⊞	<code>\obackslash</code>	○	<code>\ovoid</code>
⊛	<code>\boxcoasterisk</code>	⊕	<code>\obot</code>	▼	<code>\smalltriangledown</code>
⊣	<code>\boxdiv</code>	⊙	<code>\ocirc</code>	◀	<code>\smalltriangleleft</code>
⊤	<code>\boxdot</code>	⊛	<code>\ocoasterisk</code>	▶	<code>\smalltriangleright</code>
⊣	<code>\boxleft</code>	⊕	<code>\odiv</code>	△	<code>\smalltriangleup</code>
⊞	<code>\boxminus</code>	⊙	<code>\odot</code>		
⊠	<code>\boxplus</code>	⊕	<code>\oleft</code>		

TABLE 71: MnSymbol Geometric Binary Operators

⊞	<code>\boxbackslash</code>	▼	<code>\filledmedtriangledown</code>	⊙	<code>\ocirc</code>
⊠	<code>\boxbox</code>	◀	<code>\filledmedtriangleleft</code>	⊙	<code>\odot</code>
⊡	<code>\boxdot</code>	▶	<code>\filledmedtriangleright</code>	⊖	<code>\ominus</code>
⊞	<code>\boxminus</code>	▲	<code>\filledmedtriangleup</code>	⊕	<code>\oplus</code>
⊠	<code>\boxplus</code>	■	<code>\filledsquare</code>	⊘	<code>\oslash</code>
⊡	<code>\boxslash</code>	★	<code>\filledstar</code>	⊗	<code>\otimes</code>
⊢	<code>\boxtimes</code>	▼	<code>\filledtriangledown</code>	⊗	<code>\otimes</code>
⊣	<code>\boxvert</code>	◀	<code>\filledtriangleleft</code>	⊕	<code>\otriangle</code>
⊞	<code>\diamondbackslash</code>	▶	<code>\filledtriangleright</code>	⊖	<code>\overt</code>
⊞	<code>\diamonddiamond</code>	▲	<code>\filledtriangleup</code>	★	<code>\pentagram</code>
⊞	<code>\diamonddot</code>	◇	<code>\meddiamond</code>	◇	<code>\smalldiamond</code>
⊞	<code>\diamondminus</code>	□	<code>\medsquare</code>	□	<code>\smallsquare</code>
⊞	<code>\diamondplus</code>	☆	<code>\medstar</code>	★	<code>\smallstar</code>
⊞	<code>\diamondslash</code>	▼	<code>\medtriangledown</code>	▼	<code>\smalltriangledown</code>
⊞	<code>\diamondtimes</code>	◀	<code>\medtriangleleft</code>	◀	<code>\smalltriangleleft</code>
⊞	<code>\diamondvert</code>	▶	<code>\medtriangleright</code>	▶	<code>\smalltriangleright</code>
▼	<code>\downslice</code>	△	<code>\medtriangleup</code>	△	<code>\smalltriangleup</code>
◆	<code>\filleddiamond</code>	⊗	<code>\oast</code>	★	<code>\thinstar</code>
■	<code>\filledmedsquare</code>	⊞	<code>\obackslash</code>	△	<code>\upslice</code>

MnSymbol defines `\blacksquare` as a synonym for `\filledmedsquare`; `\square` and `\Box` as synonyms for `\medsquare`; `\diamond` as a synonym for `\smalldiamond`; `\Diamond` as a synonym for `\meddiamond`; `\star` as a synonym for `\thinstar`; `\circledast` as a synonym for `\oast`; `\circledcirc` as a synonym for `\ocirc`; and, `\circleddash` as a synonym for `\ominus`.

TABLE 72: fdsymbol Geometric Binary Operators

⊞	<code>\boxbackslash</code>	▼	<code>\medblacktriangledown</code>	⊕	<code>\oplus</code>
⊠	<code>\boxbox</code>	◀	<code>\medblacktriangleleft</code>	⊗	<code>\oslash</code>
⊡	<code>\boxdot</code>	▶	<code>\medblacktriangleright</code>	⊗	<code>\otimes</code>
⊖	<code>\boxminus</code>	▲	<code>\medblacktriangleup</code>	⊖	<code>\overt</code>
⊕	<code>\boxplus</code>	○	<code>\medcircle</code>	●	<code>\smallblackcircle</code>
⊗	<code>\boxslash</code>	◇	<code>\meddiamond</code>	◆	<code>\smallblackdiamond</code>
⊗	<code>\boxtimes</code>	/	<code>\medslash</code>	■	<code>\smallblacksquare</code>
⊞	<code>\boxvert</code>	□	<code>\medsquare</code>	★	<code>\smallblackstar</code>
◇	<code>\diamondbackslash</code>	▽	<code>\medtriangledown</code>	▼	<code>\smallblacktriangledown</code>
◇	<code>\diamonddiamond</code>	◁	<code>\medtriangleleft</code>	◀	<code>\smallblacktriangleleft</code>
◇	<code>\diamonddot</code>	▷	<code>\medtriangleright</code>	▶	<code>\smallblacktriangleright</code>
◇	<code>\diamondminus</code>	△	<code>\medtriangleup</code>	▲	<code>\smallblacktriangleup</code>
◇	<code>\diamondplus</code>	☆	<code>\medwhitestar</code>	○	<code>\smallcircle</code>
◇	<code>\diamondslash</code>	⊗	<code>\oast</code>	◇	<code>\smalldiamond</code>
◇	<code>\diamondtimes</code>	⊖	<code>\obackslash</code>	◻	<code>\smallsquare</code>
◇	<code>\diamondvert</code>	⊙	<code>\ocirc</code>	▽	<code>\smalltriangledown</code>
●	<code>\medblackcircle</code>	⊖	<code>\odash</code>	◁	<code>\smalltriangleleft</code>
◆	<code>\medblackdiamond</code>	⊙	<code>\odot</code>	▷	<code>\smalltriangleright</code>
■	<code>\medblacksquare</code>	⊖	<code>\oequal</code>	△	<code>\smalltriangleup</code>
★	<code>\medblackstar</code>	⊖	<code>\ominus</code>	☆	<code>\smallwhitestar</code>

`fdsymbol` defines synonyms for most of the preceding symbols:

◆	<code>\blackdiamond</code>	◇	<code>\diamond</code>	●	<code>\smbkcircle</code>
▲	<code>\blacktriangle</code>	◇	<code>\Diamond</code>	◆	<code>\smbkdiamond</code>
▼	<code>\blacktriangledown</code>	◇	<code>\diamondbslash</code>	■	<code>\smbklsquare</code>
◀	<code>\blacktriangleleft</code>	◇	<code>\diamondcdot</code>	☆	<code>\smwhitestar</code>
▶	<code>\blacktriangleright</code>	◆	<code>\mdblkdiamond</code>	○	<code>\smwhtcircle</code>
□	<code>\Box</code>	■	<code>\mdblksquare</code>	◇	<code>\smwhtdiamond</code>
⊞	<code>\boxbar</code>	●	<code>\mdlgbkcircle</code>	◻	<code>\smwhtsquare</code>
⊞	<code>\boxbslash</code>	◆	<code>\mdlgbkdiamond</code>	□	<code>\square</code>
⊞	<code>\boxdiag</code>	■	<code>\mdlgbklsquare</code>	★	<code>\star</code>
●	<code>\bullet</code>	○	<code>\mdlgwhtcircle</code>	△	<code>\triangle</code>
○	<code>\circ</code>	◇	<code>\mdlgwhtdiamond</code>	▽	<code>\triangledown</code>
⊗	<code>\circledast</code>	□	<code>\mdlgwhtsquare</code>	◁	<code>\triangleleft</code>
⊙	<code>\circledcirc</code>	◇	<code>\mdwhtdiamond</code>	▷	<code>\triangleright</code>
⊖	<code>\circleddash</code>	□	<code>\mdwhtsquare</code>	△	<code>\vartriangle</code>
⊖	<code>\circledequal</code>	★	<code>\medstar</code>		
⊖	<code>\circledvert</code>	⊖	<code>\obslash</code>		



TABLE 73: boisk Geometric Binary Operators

◆	<code>\blacklozenge</code>	▣	<code>\boxright</code>	□	<code>\oblong</code>
■	<code>\blacksquare</code>	◻	<code>\boxslash</code>	⊕	<code>\obot</code>
▲	<code>\blacktriangle</code>	⊠	<code>\boxtimes</code>	⊗	<code>\obslash</code>
▼	<code>\blacktriangledown</code>	▤	<code>\boxtop</code>	⊗	<code>\ogreaterthan</code>
◄	<code>\blacktriangleleft</code>	▥	<code>\boxtriangle</code>	⊕	<code>\oleft</code>
►	<code>\blacktriangleright</code>	⊗	<code>\circledast</code>	⊗	<code>\olessthan</code>
⊠	<code>\boxast</code>	⊗	<code>\circledcirc</code>	⊖	<code>\ominus</code>
▣	<code>\boxbar</code>	⊖	<code>\circleddash</code>	⊕	<code>\oplus</code>
▤	<code>\boxbot</code>	◇	<code>\diamond</code>	⊕	<code>\oright</code>
⊠	<code>\boxbox</code>	◊	<code>\diamondbar</code>	⊗	<code>\oslash</code>
◻	<code>\boxbslash</code>	◊	<code>\diamondcircle</code>	⊗	<code>\otimes</code>
⊠	<code>\boxcircle</code>	⊖	<code>\diamondminus</code>	⊕	<code>\otop</code>
▤	<code>\boxdivision</code>	◇	<code>\diamondop</code>	⊗	<code>\otriangle</code>
□	<code>\boxdot</code>	⊕	<code>\diamondplus</code>	⊗	<code>\ovee</code>
▣	<code>\boxleft</code>	⊗	<code>\diamondtimes</code>	⊗	<code>\owedge</code>
▥	<code>\boxminus</code>	◊	<code>\diamondtriangle</code>	*	<code>\star</code>
▣	<code>\boxplus</code>	⊖	<code>\obar</code>	⏏	<code>\talloblong</code>

TABLE 74: stix Geometric Binary Operators

⌘	<code>\blackhourglass</code>	◊	<code>\concavediamondtickleft</code>	⊕	<code>\oplus</code>
⊠	<code>\boxast</code>	◊	<code>\concavediamondtickright</code>	⊗	<code>\oslash</code>
▣	<code>\boxbar</code>	◇	<code>\diamond</code>	⊗	<code>\otimes</code>
⊠	<code>\boxbox</code>	◁	<code>\dsub</code>	⊗	<code>\otimes</code>
◻	<code>\boxbslash</code>	⌘	<code>\hourglass</code>	⊗	<code>\otimeshat</code>
⊠	<code>\boxcircle</code>	◊	<code>\lozengeminus</code>	▷	<code>\rsub</code>
◻	<code>\boxdiag</code>	◆	<code>\mdlgbklozenge</code>	•	<code>\smbkcircle</code>
□	<code>\boxdot</code>	○	<code>\mdlgwhtcircle</code>	*	<code>\star</code>
▥	<code>\boxminus</code>	⊖	<code>\obar</code>	⏏	<code>\talloblong</code>
▣	<code>\boxplus</code>	⊕	<code>\obot*</code>	△	<code>\triangle</code>
⊠	<code>\boxtimes</code>	⊗	<code>\obslash</code>	△	<code>\triangleminus</code>
⊗	<code>\circledast</code>	⊕	<code>\odiv</code>	△	<code>\triangleplus</code>
⊗	<code>\circledcirc</code>	⊙	<code>\odot</code>	△	<code>\triangleserifs</code>
⊖	<code>\circleddash</code>	⊗	<code>\odotslashdot*</code>	△	<code>\triangleretimes</code>
⊖	<code>\circledequal</code>	⊗	<code>\ogreaterthan</code>	•	<code>\vysmbkcircle†</code>

(continued on next page)

*(continued from previous page)*

Ⓣ	<code>\circledparallel</code>	⊗	<code>\olcross*</code>	◦	<code>\vysmwhtcircle</code>
Ⓧ	<code>\circledvert</code>	⊗	<code>\olessthan</code>	◻	<code>\whitesquaretickleft</code>
Ⓨ	<code>\circlehbar</code>	⊖	<code>\ominus</code>	◻	<code>\whitesquaretickright</code>
◊	<code>\concavediamond</code>	⊥	<code>\operp</code>		

\* Defined as an ordinary character, not as a binary relation. However, these symbols more closely resemble the other symbols in this table than they do the geometric shapes presented in Table 440, which is why they are included here.

† `stix` defines `\bullet` as a synonym for `\vysmblkcircle`.

TABLE 75: logix Geometric Binary Operators

●	<code>\BlackCircle</code>	◄	<code>\LogPast</code>
•	<code>\BlackCircleA</code>	◊	<code>\LogPos</code>
•	<code>\BlackCircleB</code>	○	<code>\LWhiteCircle</code>
•	<code>\BlackCircleC</code>	◊	<code>\LWhiteCurvedDiamond</code>
•	<code>\BlackCircleD</code>	◊	<code>\LWhiteDiamond</code>
•	<code>\BlackCircleE</code>	▽	<code>\LWhiteDownTriangle</code>
•	<code>\BlackCircleF</code>	◄	<code>\LWhiteLeftArrowHead</code>
●	<code>\BlackCircleG</code>	◄	<code>\LWhiteLeftTriangle</code>
●	<code>\BlackCircleH</code>	◻	<code>\LWhiteLozenge</code>
●	<code>\BlackCircleI</code>	▷	<code>\LWhiteRightArrowHead</code>
◆	<code>\BlackCurvedDiamond</code>	▷	<code>\LWhiteRightCurvedArrowHead</code>
◆	<code>\BlackDiamond</code>	▷	<code>\LWhiteRightTriangle</code>
•	<code>\BlackDiamondA</code>	◦	<code>\LWhiteSmallCircle</code>
•	<code>\BlackDiamondB</code>	◻	<code>\LWhiteSquare</code>
◆	<code>\BlackDiamondC</code>	◻	<code>\LWhiteSquareRoundCorners</code>
◆	<code>\BlackDiamondD</code>	△	<code>\LWhiteUpTriangle</code>
◆	<code>\BlackDiamondE</code>	◦	<code>\LWhiteVerySmallCircle</code>
◆	<code>\BlackDiamondF</code>	◻	<code>\LWhiteVerySmallSquare</code>
◆	<code>\BlackDiamondG</code>	■	<code>\Nec</code>
◆	<code>\BlackDiamondH</code>	●	<code>\Next</code>
◆	<code>\BlackDiamondI</code>	▲	<code>\NonCont</code>
▼	<code>\BlackDownTriangle</code>	○	<code>\OutlineCircle</code>
▼	<code>\BlackDownTriangleA</code>	◊	<code>\OutlineCurvedDiamond</code>
▼	<code>\BlackDownTriangleB</code>	◊	<code>\OutlineDiamond</code>
▼	<code>\BlackDownTriangleC</code>	▽	<code>\OutlineDownTriangle</code>
▼	<code>\BlackDownTriangleD</code>	◄	<code>\OutlineLeftArrowHead</code>

*(continued on next page)*

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▼	<code>\BlackDownTriangleE</code>	◄	<code>\OutlineLeftTriangle</code>
▼	<code>\BlackDownTriangleF</code>	▣	<code>\OutlineLozenge</code>
▼	<code>\BlackDownTriangleG</code>	▷	<code>\OutlineRightArrowHead</code>
▼	<code>\BlackDownTriangleH</code>	▷	<code>\OutlineRightCurvedArrowHead</code>
▼	<code>\BlackDownTriangleI</code>	▷	<code>\OutlineRightTriangle</code>
◄	<code>\BlackLeftArrowHead</code>	◦	<code>\OutlineSmallCircle</code>
◄	<code>\BlackLeftTriangle</code>	◻	<code>\OutlineSquare</code>
◦	<code>\BlackLeftTriangleA</code>	◻	<code>\OutlineSquareRoundCorners</code>
◦	<code>\BlackLeftTriangleB</code>	△	<code>\OutlineUpTriangle</code>
◦	<code>\BlackLeftTriangleC</code>	◦	<code>\OutlineVerySmallCircle</code>
◦	<code>\BlackLeftTriangleD</code>	◻	<code>\OutlineVerySmallSquare</code>
◦	<code>\BlackLeftTriangleE</code>	◄	<code>\Past</code>
◦	<code>\BlackLeftTriangleF</code>	◆	<code>\Pos</code>
◦	<code>\BlackLeftTriangleG</code>	▣	<code>\QuartedLozenge</code>
◦	<code>\BlackLeftTriangleH</code>	⊕	<code>\QuarteredCircle</code>
◦	<code>\BlackLeftTriangleI</code>	⊕	<code>\QuarteredCurvedDiamond</code>
▪	<code>\BlackLozenge</code>	⊕	<code>\QuarteredDiamond</code>
•	<code>\BlackReallySmallCircle</code>	▽	<code>\QuarteredDownTriangle</code>
◆	<code>\BlackReallySmallDiamond</code>	◄	<code>\QuarteredLeftTriangle</code>
▪	<code>\BlackReallySmallSquare</code>	▷	<code>\QuarteredRightTriangle</code>
▷	<code>\BlackRightArrowHead</code>	⊕	<code>\QuarteredSmallCircle</code>
▷	<code>\BlackRightCurvedArrowHead</code>	⊕	<code>\QuarteredSquare</code>
▷	<code>\BlackRightTriangle</code>	⊕	<code>\QuarteredSquareRoundCorners</code>
◦	<code>\BlackRightTriangleA</code>	△	<code>\QuarteredUpTriangle</code>
◦	<code>\BlackRightTriangleB</code>	◦	<code>\QuarteredVerySmallCircle</code>
◦	<code>\BlackRightTriangleC</code>	▣	<code>\QuarteredVerySmallSquare</code>
◦	<code>\BlackRightTriangleD</code>	▽	<code>\TmpCont</code>
◦	<code>\BlackRightTriangleE</code>	▷	<code>\TmpFutr</code>
◦	<code>\BlackRightTriangleF</code>	⊕	<code>\TmpNec</code>
◦	<code>\BlackRightTriangleG</code>	⊖	<code>\TmpNext</code>
◦	<code>\BlackRightTriangleH</code>	△	<code>\TmpNonCont</code>
◦	<code>\BlackRightTriangleI</code>	◄	<code>\TmpPast</code>
•	<code>\BlackSmallCircle</code>	⊕	<code>\TmpPos</code>
■	<code>\BlackSquare</code>	⊖	<code>\UpSlahsedSquareRoundCorners</code>
▪	<code>\BlackSquareA</code>	⊖	<code>\UpSlashedCircle</code>
▪	<code>\BlackSquareB</code>	⊕	<code>\UpSlashedCurvedDiamond</code>
▪	<code>\BlackSquareC</code>	⊕	<code>\UpSlashedDiamond</code>
▪	<code>\BlackSquareD</code>	▽	<code>\UpSlashedDownTriangle</code>
▪	<code>\BlackSquareE</code>	◄	<code>\UpSlashedLeftTriangle</code>
▪	<code>\BlackSquareF</code>	▣	<code>\UpSlashedLozenge</code>
▪	<code>\BlackSquareG</code>	▷	<code>\UpSlashedRightTriangle</code>
▪	<code>\BlackSquareH</code>	◦	<code>\UpSlashedSmallCircle</code>
▪	<code>\BlackSquareI</code>	⊕	<code>\UpSlashedSquare</code>
•	<code>\BlackSquareRoundCorners</code>	△	<code>\UpSlashedUpTriangle</code>

























































































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▲	<code>\BlackUpTriangle</code>	◦	<code>\UpSlashedVerySmallCircle</code>
▲	<code>\BlackUpTriangleA</code>	◻	<code>\UpSlashedVerySmallSquare</code>
▲	<code>\BlackUpTriangleB</code>	⊕	<code>\VerticallyDividedCircle</code>
▲	<code>\BlackUpTriangleC</code>	⋈	<code>\VerticallyDividedCurvedDiamond</code>
▲	<code>\BlackUpTriangleD</code>	⋈	<code>\VerticallyDividedDiamond</code>
▲	<code>\BlackUpTriangleE</code>	▽	<code>\VerticallyDividedDownTriangle</code>
▲	<code>\BlackUpTriangleF</code>	◄	<code>\VerticallyDividedLeftTriangle</code>
▲	<code>\BlackUpTriangleG</code>	▣	<code>\VerticallyDividedLozenge</code>
▲	<code>\BlackUpTriangleH</code>	▷	<code>\VerticallyDividedRightTriangle</code>
▲	<code>\BlackUpTriangleI</code>	⊙	<code>\VerticallyDividedSmallCircle</code>
•	<code>\BlackVerySmallCircle</code>	▣	<code>\VerticallyDividedSquare</code>
▪	<code>\BlackVerySmallSquare</code>	⊕	<code>\VerticallyDividedSquareRoundCorners</code>
▼	<code>\Cont</code>	△	<code>\VerticallyDividedUpTriangle</code>
⊗	<code>\CrossedCircle</code>	◦	<code>\VerticallyDividedVerySmallCircle</code>
⋈	<code>\CrossedCurvedDiamond</code>	◻	<code>\VerticallyDividedVerySmallSquare</code>
⋈	<code>\CrossedDiamond</code>	○	<code>\WhiteCircle</code>
▽	<code>\CrossedDownTriangle</code>	◦	<code>\WhiteCircleA</code>
◄	<code>\CrossedLeftTriangle</code>	◦	<code>\WhiteCircleB</code>
▣	<code>\CrossedLozenge</code>	◦	<code>\WhiteCircleC</code>
▷	<code>\CrossedRightTriangle</code>	⊙	<code>\WhiteCircleContainingBlackCircle</code>
⊙	<code>\CrossedSmallCircle</code>	○	<code>\WhiteCircleD</code>
▣	<code>\CrossedSquare</code>	○	<code>\WhiteCircleE</code>
⊗	<code>\CrossedSquareRoundCorners</code>	○	<code>\WhiteCircleF</code>
△	<code>\CrossedUpTriangle</code>	○	<code>\WhiteCircleG</code>
◦	<code>\CrossedVerySmallCircle</code>	○	<code>\WhiteCircleH</code>
◻	<code>\CrossedVerySmallSquare</code>	○	<code>\WhiteCircleI</code>
▽	<code>\DeoCont</code>	◇	<code>\WhiteCurvedDiamond</code>
▷	<code>\DeoFutr</code>	⋈	<code>\WhiteCurvedDiamondContainingBlackDiamond</code>
◻	<code>\DeoNec</code>	◇	<code>\WhiteDiamond</code>
○	<code>\DeoNext</code>	◦	<code>\WhiteDiamondA</code>
△	<code>\DeoNonCont</code>	◦	<code>\WhiteDiamondB</code>
◄	<code>\DeoPast</code>	◦	<code>\WhiteDiamondC</code>
◇	<code>\DeoPos</code>	⋈	<code>\WhiteDiamondContainingBlackDiamond</code>
○	<code>\DottedCirc1</code>	◇	<code>\WhiteDiamondD</code>
⋈	<code>\DottedCurvedDiamond</code>	◇	<code>\WhiteDiamondE</code>
⋈	<code>\DottedDiamond</code>	◇	<code>\WhiteDiamondF</code>
▽	<code>\DottedDownTriangle</code>	◇	<code>\WhiteDiamondG</code>
◄	<code>\DottedLeftArrowHead</code>	◇	<code>\WhiteDiamondH</code>
◄	<code>\DottedLeftTriangle</code>	◇	<code>\WhiteDiamondI</code>
▣	<code>\DottedLozenge</code>	▽	<code>\WhiteDownTriangle</code>
▷	<code>\DottedRightArrowHead</code>	▼	<code>\WhiteDownTriangleA</code>
▷	<code>\DottedRightCurvedArrowHead</code>	▼	<code>\WhiteDownTriangleB</code>
▷	<code>\DottedRightTriangle</code>	▼	<code>\WhiteDownTriangleC</code>
◦	<code>\DottedSmallCircle</code>	▼	<code>\WhiteDownTriangleContainingBlackDownTriangle</code>

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	<code>\DottedSquare</code>		<code>\WhiteDownTriangleD</code>
	<code>\DottedSquareRoundCorners</code>		<code>\WhiteDownTriangleE</code>
	<code>\DottedUpTriangle</code>		<code>\WhiteDownTriangleF</code>
	<code>\DottedVerySmallCircle</code>		<code>\WhiteDownTriangleG</code>
	<code>\DottedVerySmallSquare</code>		<code>\WhiteDownTriangleH</code>
	<code>\DownSlashedCircle</code>		<code>\WhiteDownTriangleI</code>
	<code>\DownSlashedCurvedDiamond</code>		<code>\WhiteLeftArrowHead</code>
	<code>\DownSlashedDiamond</code>		<code>\WhiteLeftTriangle</code>
	<code>\DownSlashedDownTriangle</code>		<code>\WhiteLeftTriangleA</code>
	<code>\DownSlashedLeftTriangle</code>		<code>\WhiteLeftTriangleB</code>
	<code>\DownSlashedLozenge</code>		<code>\WhiteLeftTriangleC</code>
	<code>\DownSlashedRightTriangle</code>		<code>\WhiteLeftTriangleContainingBlackLeftTriangle</code>
	<code>\DownSlashedSmallCircle</code>		<code>\WhiteLeftTriangleD</code>
	<code>\DownSlashedSquare</code>		<code>\WhiteLeftTriangleE</code>
	<code>\DownSlashedSquareRoundCorners</code>		<code>\WhiteLeftTriangleF</code>
	<code>\DownSlashedUpTriangle</code>		<code>\WhiteLeftTriangleG</code>
	<code>\DownSlashedVerySmallCircle</code>		<code>\WhiteLeftTriangleH</code>
	<code>\DownSlashedVerySmallSquare</code>		<code>\WhiteLeftTriangleI</code>
	<code>\DoxCont</code>		<code>\WhiteLozenge</code>
	<code>\DoxFutr</code>		<code>\WhiteLozengeContainingBlackLozenge</code>
	<code>\DoxNec</code>		<code>\WhiteReallySmallCircle</code>
	<code>\DoxNext</code>		<code>\WhiteReallySmallDiamond</code>
	<code>\DoxNonCont</code>		<code>\WhiteReallySmallSquare</code>
	<code>\DoxPast</code>		<code>\WhiteRightArrowHead</code>
	<code>\DoxPos</code>		<code>\WhiteRightCurvedArrowHead</code>
	<code>\FacCont</code>		<code>\WhiteRightTriangle</code>
	<code>\FacFutr</code>		<code>\WhiteRightTriangleA</code>
	<code>\FacNec</code>		<code>\WhiteRightTriangleB</code>
	<code>\FacNext</code>		<code>\WhiteRightTriangleC</code>
	<code>\FacNonCont</code>		<code>\WhiteRightTriangleContainingBlackRightTriangle</code>
	<code>\FacPast</code>		<code>\WhiteRightTriangleD</code>
	<code>\FacPos</code>		<code>\WhiteRightTriangleE</code>
	<code>\Futr</code>		<code>\WhiteRightTriangleF</code>
	<code>\HorizontallyDividedCircle</code>		<code>\WhiteRightTriangleG</code>
	<code>\HorizontallyDividedCurvedDiamond</code>		<code>\WhiteRightTriangleH</code>
	<code>\HorizontallyDividedDiamond</code>		<code>\WhiteRightTriangleI</code>
	<code>\HorizontallyDividedDownTriangle</code>		<code>\WhiteSmallCircle</code>
	<code>\HorizontallyDividedLeftTriangle</code>		<code>\WhiteSmallCircleContainingBlackCircle</code>
	<code>\HorizontallyDividedLozenge</code>		<code>\WhiteSquare</code>
	<code>\HorizontallyDividedRightTriangle</code>		<code>\WhiteSquareA</code>
	<code>\HorizontallyDividedSmallCircle</code>		<code>\WhiteSquareB</code>
	<code>\HorizontallyDividedSquare</code>		<code>\WhiteSquareC</code>
	<code>\HorizontallyDividedSquareRoundCorners</code>		<code>\WhiteSquareContainingBlackSquare</code>
	<code>\HorizontallyDividedUpTriangle</code>		<code>\WhiteSquareD</code>

















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◦	<code>\HorizontallyDividedVerySmallCircle</code>	◻	<code>\WhiteSquareE</code>
▣	<code>\HorizontallyDividedVerySmallSquare</code>	◻	<code>\WhiteSquareF</code>
●	<code>\LBlackCircle</code>	◻	<code>\WhiteSquareG</code>
◆	<code>\LBlackCurvedDiamond</code>	◻	<code>\WhiteSquareH</code>
◆	<code>\LBlackDiamond</code>	◻	<code>\WhiteSquareI</code>
▼	<code>\LBlackDownTriangle</code>	◻	<code>\WhiteSquareRoundCorners</code>
◄	<code>\LBlackLeftArrowHead</code>	◻	<code>\WhiteSquareRoundCornersContainingBlackSquare</code>
◄	<code>\LBlackLeftTriangle</code>	△	<code>\WhiteUpTriangle</code>
■	<code>\LBlackLozenge</code>	△	<code>\WhiteUpTriangleA</code>
►	<code>\LBlackRightArrowHead</code>	△	<code>\WhiteUpTriangleB</code>
►	<code>\LBlackRightCurvedArrowHead</code>	△	<code>\WhiteUpTriangleC</code>
►	<code>\LBlackRightTriangle</code>	△	<code>\WhiteUpTriangleContainingBlackUpTriangle</code>
●	<code>\LBlackSmallCircle</code>	△	<code>\WhiteUpTriangleD</code>
■	<code>\LBlackSquare</code>	△	<code>\WhiteUpTriangleE</code>
■	<code>\LBlackSquareRoundCorners</code>	△	<code>\WhiteUpTriangleF</code>
▲	<code>\LBlackUpTriangle</code>	△	<code>\WhiteUpTriangleG</code>
•	<code>\LBlackVerySmallCircle</code>	△	<code>\WhiteUpTriangleH</code>
■	<code>\LBlackVerySmallSquare</code>	△	<code>\WhiteUpTriangleI</code>
▽	<code>\LogCont</code>	◦	<code>\WhiteVerySmallCircle</code>
▷	<code>\LogFutr</code>	◦	<code>\WhiteVerySmallCircleContainingBlackCircle</code>
◻	<code>\LogNec</code>	◻	<code>\WhiteVerySmallSquare</code>
◉	<code>\LogNext</code>	◻	<code>\WhiteVerySmallSquareContainingBlackSquare</code>
△	<code>\LogNonCont</code>		

logix requires either `LuaLATEX` or `XELATEX`.

TABLE 76: halloweenmath Halloween-Themed Math Operators

	<code>\bigpumpkin<sup>†</sup></code>		<code>\mathleftghost</code>		<code>\reversemathcloud</code>
	<code>\bigskull</code>		<code>\mathrightbat</code>		<code>\reversemathwitch<sup>†</sup></code>
	<code>\mathbat</code>		<code>\mathrightghost</code>		<code>\reversemathwitch*<sup>†</sup></code>
	<code>\mathcloud</code>		<code>\mathwitch*<sup>†</sup></code>		<code>\skull</code>
	<code>\mathghost</code>		<code>\mathwitch<sup>†</sup></code>		
	<code>\mathleftbat</code>		<code>\pumpkin</code>		

<sup>†</sup> These symbols accept limits. For example, `\mathwitch*_{i=0}^{\infty} f(x)` produces “  $f(x)$ ” in text mode and

$$\underset{i=0}{\overset{\infty}{\text{witch}}} f(x)$$

in display mode.

<sup>‡</sup> `\greatpumpkin` is a synonym for `\bigpumpkin`.

TABLE 77: stix Small Integrals

$\int$	<code>\smallawint</code>	$\int$	<code>\smallintcap</code>	$\int$	<code>\smalloint</code>
$\int$	<code>\smallcirfnint</code>	$\int$	<code>\smallintclockwise</code>	$\int$	<code>\smallointctrckwise</code>
$\int$	<code>\smallfint</code>	$\int$	<code>\smallintcup</code>	$\int$	<code>\smallpointint</code>
$\int$	<code>\smalliiint</code>	$\int$	<code>\smallintlarhk</code>	$\int$	<code>\smallrppointint</code>
$\int$	<code>\smalliiint</code>	$\int$	<code>\smallintx</code>	$\int$	<code>\smallscpointint</code>
$\int$	<code>\smalliint</code>	$\int$	<code>\smalllowint</code>	$\int$	<code>\smallsqint</code>
$\int$	<code>\smallint</code>	$\int$	<code>\smallnpointint</code>	$\int$	<code>\smallsumint</code>
$\int$	<code>\smallintbar</code>	$\int$	<code>\smalloiiint</code>	$\int$	<code>\smallupint</code>
$\int$	<code>\smallintBar</code>	$\int$	<code>\smallooint</code>	$\int$	<code>\smallvarointclockwise</code>

By default, each of the preceding commands points to a slanted version of the glyph, as shown. The `upint` package option typesets each integral instead as an upright version. Slanted and upright integrals can be mixed, however, by explicitly using the commands shown in Table 78.

TABLE 78: stix Small Integrals with Explicit Slant

$\int$	<code>\smallawintsl</code>	$\int$	<code>\smallawintup</code>
$\int$	<code>\smallcirfnintsl</code>	$\int$	<code>\smallcirfnintup</code>
$\int$	<code>\smallfintsl</code>	$\int$	<code>\smallfintup</code>
$\int$	<code>\smalliiintsl</code>	$\int$	<code>\smalliiintup</code>
$\int$	<code>\smalliiintsl</code>	$\int$	<code>\smalliiintup</code>
$\int$	<code>\smalliintsl</code>	$\int$	<code>\smalliintup</code>
$\int$	<code>\smallintbarsl</code>	$\int$	<code>\smallintBarup</code>
$\int$	<code>\smallintBarsl</code>	$\int$	<code>\smallintbarup</code>
$\int$	<code>\smallintcapsl</code>	$\int$	<code>\smallintcapup</code>
$\int$	<code>\smallintclockwisel</code>	$\int$	<code>\smallintclockwiseup</code>
$\int$	<code>\smallintcupsl</code>	$\int$	<code>\smallintcupup</code>
$\int$	<code>\smallintlarhksl</code>	$\int$	<code>\smallintlarhkup</code>
$\int$	<code>\smallintsl</code>	$\int$	<code>\smallintup</code>
$\int$	<code>\smallintxsl</code>	$\int$	<code>\smallintxup</code>
$\int$	<code>\smalllowintsl</code>	$\int$	<code>\smalllowintup</code>
$\int$	<code>\smallnpointsl</code>	$\int$	<code>\smallnpointup</code>
$\int$	<code>\smalloiiintsl</code>	$\int$	<code>\smalloiiintup</code>
$\int$	<code>\smalloointsl</code>	$\int$	<code>\smalloointup</code>
$\int$	<code>\smallointctrckwisel</code>	$\int$	<code>\smallointctrckwiseup</code>
$\int$	<code>\smallointsl</code>	$\int$	<code>\smallointup</code>
$\int$	<code>\smallpointintsl</code>	$\int$	<code>\smallpointintup</code>
$\int$	<code>\smallrppointintsl</code>	$\int$	<code>\smallrppointintup</code>
$\int$	<code>\smallscpointintsl</code>	$\int$	<code>\smallscpointintup</code>

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$\int$	<code>\smallsqintsl</code>	$\int$	<code>\smallsqintup</code>
$\sum$	<code>\smallsumintsl</code>	$\sum$	<code>\smallsumintup</code>
$\int$	<code>\smallupintsl</code>	$\int$	<code>\smallupintup</code>
$\oint$	<code>\smallvarointclockwise</code>	$\oint$	<code>\smallvarointclockwiseup</code>

Instead of using the preceding symbols directly, it is generally preferable to use the symbols listed in Table 77 either with or without the `upint` package option. Specifying `upint` selects each integral's upright (`up`) variant, while omitting `upint` selects each integral's slanted (`sl`) variant. Use the symbols shown in Table 78 only when you need to include both upright and slanted variations of a symbol in the same document.

TABLE 79: Variable-sized Math Operators

$\cap$	$\cap$	<code>\bigcap</code>	$\otimes$	$\otimes$	<code>\bigotimes</code>	$\wedge$	$\wedge$	<code>\bigwedge</code>	$\prod$	$\prod$	<code>\prod</code>
$\cup$	$\cup$	<code>\bigcup</code>	$\sqcup$	$\sqcup$	<code>\bigsqcup</code>	$\coprod$	$\coprod$	<code>\coprod</code>	$\sum$	$\sum$	<code>\sum</code>
$\odot$	$\odot$	<code>\bigodot</code>	$\oplus$	$\oplus$	<code>\bigoplus</code>	$\int$	$\int$	<code>\int</code>			
$\oplus$	$\oplus$	<code>\bigoplus</code>	$\vee$	$\vee$	<code>\bigvee</code>	$\oint$	$\oint$	<code>\oint</code>			

TABLE 80:  $\mathcal{AMS}$  Variable-sized Math Operators

$\iint$	$\iint$	<code>\iint</code>	$\iiint$	$\iiint$	<code>\iiint</code>
$\iiint$	$\iiint$	<code>\iiiint</code>	$\int \cdots \int$	$\int \cdots \int$	<code>\idotsint</code>

TABLE 81: `stmaryrd` Variable-sized Math Operators

$\square$	$\square$	<code>\bigbox</code>	$\parallel$	$\parallel$	<code>\biginterleave</code>	$\square$	$\square$	<code>\bigsqcap</code>
$\curlyvee$	$\curlyvee$	<code>\bigcurlyvee</code>	$\bigplus$	$\bigplus$	<code>\bignplus</code>	$\nabla$	$\nabla$	<code>\bigtriangledown</code>
$\curlywedge$	$\curlywedge$	<code>\bigcurlywedge</code>	$\parallel$	$\parallel$	<code>\bigparallel</code>	$\triangle$	$\triangle$	<code>\bigtriangleup</code>



TABLE 82: wasysym Variable-sized Math Operators

$$\int \int \quad \backslash\text{int} \quad \iint \iiint \quad \backslash\text{iint} \quad \iiint \iiiii \quad \backslash\text{iiint}$$

$$\oint \oint \quad \backslash\text{ooint} \quad \oiint \oiint \quad \backslash\text{oiint}$$

If `wasysym` is loaded without package options then none of the preceding symbols are defined. However, `\varint` produces `wasysym`'s `\int` glyph, and `\varoint` produces `wasysym`'s `\oint` glyph.

If `wasysym` is loaded with the `integrals` option then all of the preceding symbols are defined, but `\varint` and `\varoint` are left undefined.

If `wasysym` is loaded with the `nointegrals` option then none of the preceding symbols, `\varint`, or `\varoint` are defined.

TABLE 83: mathabx Variable-sized Math Operators

$\Upsilon \Upsilon$	<code>\bigcurlyvee</code>	$\boxslash \boxslash$	<code>\bigboxslash</code>	$\oplus \oplus$	<code>\bigoright</code>
$\sqcap \sqcap$	<code>\bigsqcap</code>	$\boxtimes \boxtimes$	<code>\bigboxtimes</code>	$\oslash \oslash$	<code>\bigoslash</code>
$\curlywedge \curlywedge$	<code>\bigcurlywedge</code>	$\boxplus \boxplus$	<code>\bigboxplus</code>	$\oplus \oplus$	<code>\bigotop</code>
$\boxast \boxast$	<code>\bigboxasterisk</code>	$\boxtriangleup \boxtriangleup$	<code>\bigboxtriangleup</code>	$\triangle \triangle$	<code>\bigotriangleup</code>
$\boxbackslash \boxbackslash$	<code>\bigboxbackslash</code>	$\square \square$	<code>\bigboxvoid</code>	$\circ \circ$	<code>\bigovoid</code>
$\boxbot \boxbot$	<code>\bigboxbot</code>	$\complement \complement$	<code>\bigcomplementtop</code>	$+ +$	<code>\bigplus</code>
$\boxcirc \boxcirc$	<code>\bigboxcirc</code>	$\bigcirc \bigcirc$	<code>\bigcircasterisk</code>	$\boxplus \boxplus$	<code>\bigsqplus</code>
$\boxcoasterisk \boxcoasterisk$	<code>\bigboxcoasterisk</code>	$\oslash \oslash$	<code>\bigoslashbackslash</code>	$\times \times$	<code>\bigtimes</code>

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$\boxed{\div} \boxed{\div}$	<code>\bigboxdiv</code>	$\oplus \oplus$	<code>\bigobot</code>	$\iiint \iiint$	<code>\iiint</code>
$\boxed{\cdot} \boxed{\cdot}$	<code>\bigboxdot</code>	$\odot \odot$	<code>\bigocirc</code>	$\iint \iint$	<code>\iint</code>
$\boxed{\leftarrow} \boxed{\leftarrow}$	<code>\bigboxleft</code>	$\otimes \otimes$	<code>\bigocoasterisk</code>	$\int \int$	<code>\int</code>
$\boxed{-} \boxed{-}$	<code>\bigboxminus</code>	$\oslash \oslash$	<code>\bigodiv</code>	$\oiint \oiint$	<code>\oiint</code>
$\boxed{+} \boxed{+}$	<code>\bigboxplus</code>	$\oplus \oplus$	<code>\bigoleft</code>	$\oint \oint$	<code>\oint</code>
$\boxed{\rightarrow} \boxed{\rightarrow}$	<code>\bigboxright</code>	$\ominus \ominus$	<code>\bigominus</code>		

TABLE 84: txfonts/pxfonts Variable-sized Math Operators

$\boxed{+} \boxed{+}$	<code>\bigsqcapplus</code>	$\oint \oint$	<code>\ointclockwise</code>
$\boxed{+} \boxed{+}$	<code>\bigsqcupplus</code>	$\oint \oint$	<code>\ointctrlockwise</code>
$f f$	<code>\fint</code>	$\iiint \iiint$	<code>\sqiiint</code>
$\int \dots \int \int \dots \int$	<code>\idotsint</code>	$\iint \iint$	<code>\sqiint</code>
$\iiint \iiint$	<code>\iiiint</code>	$\oint \oint$	<code>\sqint</code>
$\iint \iint$	<code>\iiint</code>	$\iiint \iiint$	<code>\varoiintclockwise</code>

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$\iint$	$\iint$	<code>\iint</code>	$\iiint$	$\iiint$	<code>\varoiintctrlockwise</code>
$\oiint$	$\oiint$	<code>\oiintclockwise</code>	$\oiint$	$\oiint$	<code>\varoiintclockwise</code>
$\oiint$	$\oiint$	<code>\oiintctrlockwise</code>	$\oiint$	$\oiint$	<code>\varoiintctrlockwise</code>
$\oiint$	$\oiint$	<code>\oiint</code>	$\oint$	$\oint$	<code>\varointclockwise</code>
$\oint$	$\oint$	<code>\ointclockwise</code>	$\oint$	$\oint$	<code>\varointctrlockwise</code>
$\oint$	$\oint$	<code>\ointctrlockwise</code>	$\times$	$\times$	<code>\varprod</code>
$\oint$	$\oint$	<code>\oint</code>			

TABLE 85: esint Variable-sized Math Operators

$\int \dots \int$	$\int \dots \int$	<code>\dotsint</code>	$\oint$	$\oint$	<code>\ointclockwise</code>
$\int$	$\int$	<code>\fint</code>	$\oint$	$\oint$	<code>\ointctrlockwise</code>
$\iiint$	$\iiint$	<code>\iiiint</code>	$\int$	$\int$	<code>\sqint</code>
$\iint$	$\iint$	<code>\iint</code>	$\int$	$\int$	<code>\sqint</code>
$\iint$	$\iint$	<code>\iint</code>	$\oint$	$\oint$	<code>\varoiint</code>
$\int$	$\int$	<code>\landdownint</code>	$\oint$	$\oint$	<code>\varointclockwise</code>
$\int$	$\int$	<code>\landupint</code>	$\oint$	$\oint$	<code>\varointctrlockwise</code>
$\oint$	$\oint$	<code>\oint</code>			

TABLE 86: bigints Variable-sized Math Operators

$\int$	$\int$	<code>\bigint</code>	$\oint$	$\oint$	<code>\bigoint</code>
$\int$	$\int$	<code>\bigints</code>	$\oint$	$\oint$	<code>\bigoints</code>
$\int$	$\int$	<code>\bigintss</code>	$\oint$	$\oint$	<code>\bigointss</code>
$\int$	$\int$	<code>\bigintsss</code>	$\oint$	$\oint$	<code>\bigointsss</code>
$\int$	$\int$	<code>\bigintssss</code>	$\oint$	$\oint$	<code>\bigointssss</code>

TABLE 87: MnSymbol Variable-sized Math Operators

$\cap$	$\cap$	<code>\bigcap</code>	$\ominus$	$\ominus$	<code>\bigominus</code>	$\complement$	$\complement$	<code>\complement</code>
$\cap$	$\cap$	<code>\bigcapdot</code>	$\oplus$	$\oplus$	<code>\bigoplus</code>	$\amalg$	$\amalg$	<code>\coprod</code>
$\cap$	$\cap$	<code>\bigcapplus</code>	$\oslash$	$\oslash$	<code>\bigoslash</code>	$\int \cdots \int$	$\int \cdots \int$	<code>\idotsint</code>
$\bigcirc$	$\bigcirc$	<code>\bigcircle</code>	$\otimes$	$\otimes$	<code>\bigostar</code>	$\iiint$	$\iiint$	<code>\iiiint</code>
$\cup$	$\cup$	<code>\bigcup</code>	$\otimes$	$\otimes$	<code>\bigotimes</code>	$\iiint$	$\iiint$	<code>\iiint</code>
$\cup$	$\cup$	<code>\bigcupdot</code>	$\triangleup$	$\triangleup$	<code>\bigotriangleup</code>	$\iint$	$\iint$	<code>\iint</code>
$\cup$	$\cup$	<code>\bigcupplus*</code>	$\oslash$	$\oslash$	<code>\bigoslash</code>	$\int$	$\int$	<code>\int</code>
$\curlyvee$	$\curlyvee$	<code>\bigcurlyvee</code>	$+$	$+$	<code>\bigplus</code>	$\int$	$\int$	<code>\landdownint</code>
$\curlyvee$	$\curlyvee$	<code>\bigcurlyveedot</code>	$\sqcap$	$\sqcap$	<code>\bigsqcap</code>	$\int$	$\int$	<code>\landupint</code>
$\curlywedge$	$\curlywedge$	<code>\bigcurlywedge</code>	$\sqcap$	$\sqcap$	<code>\bigsqcapdot</code>	$\oint$	$\oint$	<code>\lrcircleleftint</code>
$\curlywedge$	$\curlywedge$	<code>\bigcurlywedgedot</code>	$\cap$	$\cap$	<code>\bigsqcapplus</code>	$\oint$	$\oint$	<code>\lrcirclearightint</code>

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$\mathbb{W}$	$\mathbb{V}$	<code>\bigdoublecurlyvee</code>	$\sqcup$	$\sqcup$	<code>\bigsqcup</code>	$\oint$	$\oiint$	<code>\oiint</code>
$\mathbb{A}$	$\mathbb{A}$	<code>\bigdoublecurlywedge</code>	$\sqcup$	$\sqcup$	<code>\bigsqcupdot</code>	$\oint$	$\oint$	<code>\oint</code>
$\mathbb{W}$	$\mathbb{V}$	<code>\bigdoublevee</code>	$\oplus$	$\oplus$	<code>\bigsqcupplus</code>	$\prod$	$\prod$	<code>\prod</code>
$\mathbb{A}$	$\mathbb{A}$	<code>\bigdoublewedge</code>	$\times$	$\times$	<code>\bigtimes</code>	$\oint$	$\oint$	<code>\rcircleleftint</code>
$\oplus$	$\oplus$	<code>\bigcircast</code>	$\vee$	$\vee$	<code>\bigvee</code>	$\oint$	$\oint$	<code>\rcirclerightint</code>
$\oslash$	$\oslash$	<code>\bigobackslash</code>	$\vee$	$\vee$	<code>\bigveedot</code>	$f$	$f$	<code>\strokedint</code>
$\odot$	$\odot$	<code>\bigocirc</code>	$\wedge$	$\wedge$	<code>\bigwedge</code>	$\Sigma$	$\Sigma$	<code>\sum</code>
$\odot$	$\odot$	<code>\bigodot</code>	$\wedge$	$\wedge$	<code>\bigwedgedot</code>	$\oint$	$\oint$	<code>\sumint</code>

\* MnSymbol defines `\biguplus` as a synonym for `\bigcupplus`.

TABLE 88: fdsymbol Variable-sized Math Operators

$\cap$	$\cap$	<code>\bigcap</code>	$\sqcup$	$\sqcup$	<code>\bigsqcup</code>	$\int$	$\int$	<code>\landupint</code>
$\cap$	$\cap$	<code>\bigcapdot</code>	$\sqcup$	$\sqcup$	<code>\bigsqcupdot</code>	$\oint$	$\oint$	<code>\lcircleleftint</code>
$\cap$	$\cap$	<code>\bigcapplus</code>	$\oplus$	$\oplus$	<code>\bigsqcupplus</code>	$\oint$	$\oint$	<code>\lcirclerightint</code>
$\cup$	$\cup$	<code>\bigcup</code>	$\times$	$\times$	<code>\bigtimes</code>	$\oiint$	$\oiint$	<code>\oiint</code>
$\cup$	$\cup$	<code>\bigcupdot</code>	$\vee$	$\vee$	<code>\bigvee</code>	$\oint$	$\oint$	<code>\oiint</code>
$\cup$	$\cup$	<code>\bigcupplus</code>	$\vee$	$\vee$	<code>\bigveedot</code>	$\oint$	$\oint$	<code>\oint</code>
$\curlyvee$	$\curlyvee$	<code>\bigcurlyvee</code>	$\wedge$	$\wedge$	<code>\bigwedge</code>	$\Sigma$	$\Sigma$	<code>\osum</code>
$\curlywedge$	$\curlywedge$	<code>\bigcurlywedge</code>	$\wedge$	$\wedge$	<code>\bigwedgedot</code>	$\prod$	$\prod$	<code>\prod</code>
$\mathbb{W}$	$\mathbb{W}$	<code>\bigdoublevee</code>	$\sqcup$	$\sqcup$	<code>\coprod</code>	$\oint$	$\oint$	<code>\rcircleleftint</code>

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$\bigwedge$	$\bigwedge$	<code>\bigdoublewedge</code>	$\int$	$\int$	<code>\fint</code>	$\oint$	$\oint$	<code>\rcircclerightint</code>
$\bigoplus$	$\bigoplus$	<code>\bigoplus</code>	$\int \dots \int$	$\int \dots \int$	<code>\idotsint</code>	$\Sigma$	$\Sigma$	<code>\sum</code>
$\bigodot$	$\bigodot$	<code>\bigodot</code>	$\iiint$	$\iiint$	<code>\iiiint</code>	$\int$	$\int$	<code>\sumint</code>
$\bigoplus$	$\bigoplus$	<code>\bigoplus</code>	$\iiint$	$\iiint$	<code>\iiint</code>	$\prod$	$\prod$	<code>\varcoprod</code>
$\bigotimes$	$\bigotimes$	<code>\bigotimes</code>	$\iint$	$\iint$	<code>\iint</code>	$\sum$	$\sum$	<code>\varosum</code>
$\bigplus$	$\bigplus$	<code>\bigplus</code>	$\int$	$\int$	<code>\int</code>	$\prod$	$\prod$	<code>\varprod</code>
$\bigsqcap$	$\bigsqcap$	<code>\bigsqcap</code>	$\int$	$\int$	<code>\intbar</code>	$\Sigma$	$\Sigma$	<code>\varsum</code>
$\bigsqcap\cdot$	$\bigsqcap\cdot$	<code>\bigsqcap\cdot</code>	$\int$	$\int$	<code>\intBar</code>	$\int$	$\int$	<code>\varsumint</code>
$\bigsqcup\cdot$	$\bigsqcup\cdot$	<code>\bigsqcup\cdot</code>	$\int$	$\int$	<code>\landdownint</code>			

\* `fdsymbol` defines `\awint` as a synonym for `\landdownint`, `\biguplus` as a synonym for `\bigcupplus`, `\conjquant` as a synonym for `\bigdoublewedge`, `\disjquant` as a synonym for `\bigdoublevee`, `\dotsint` as a synonym for `\idotsint`, `\intclockwise` as a synonym for `\landupint`, `\intctrlockwise` as a synonym for `\landdownint`, `\modtwosum` as a synonym for `\osum`, `\ointclockwise` as a synonym for `\lcircleleftint`, `\ointctrlockwise` as a synonym for `\rcircclerightint`, `\varmodtwosum` as a synonym for `\varosum`, `\varointclockwise` as a synonym for `\lcircleleftint`, and `\varointctrlockwise` as a synonym for `\rcircleleftint`.

TABLE 89: `boisik` Variable-sized Math Operators

$\int \int \int \dots \int \int \dots \int \int \dots \int \int \dots \int$  `\intup`

`boisik` additionally provides all of the symbols in Table 79.

TABLE 90: stix Variable-sized Math Operators

$\int$	$\int$	<code>\awint</code>	$\amalg$	$\amalg$	<code>\coprod</code>	$\oiint$	$\oiint$	<code>\oiint</code>
$\BbbS$	$\BbbS$	<code>\Bbbsum</code>	$\W$	$\W$	<code>\disjquant</code>	$\oint$	$\oint$	<code>\oint</code>
$\bigcap$	$\bigcap$	<code>\bigcap</code>	$\int$	$\int$	<code>\fint</code>	$\oint$	$\oint$	<code>\oint</code>
$\bigcup$	$\bigcup$	<code>\bigcup</code>	$\iiint$	$\iiint$	<code>\iiiint</code>	$\oint$	$\oint$	<code>\ointctrlockwise</code>
$\bigcup\cdot$	$\bigcup\cdot$	<code>\bigcupdot</code>	$\iiint$	$\iiint$	<code>\iiint</code>	$\oint$	$\oint$	<code>\pointint</code>
$\bigodot$	$\bigodot$	<code>\bigodot</code>	$\iint$	$\iint$	<code>\iint</code>	$\prod$	$\prod$	<code>\prod</code>
$\bigoplus$	$\bigoplus$	<code>\bigoplus</code>	$\int$	$\int$	<code>\int</code>	$\int$	$\int$	<code>\rppoint</code>
$\bigotimes$	$\bigotimes$	<code>\bigotimes</code>	$\int$	$\int$	<code>\intbar</code>	$\int$	$\int$	<code>\scpoint</code>
$\bigsqcap$	$\bigsqcap$	<code>\bigsqcap</code>	$\int$	$\int$	<code>\intBar</code>	$\int$	$\int$	<code>\sqint</code>
$\bigsqcup$	$\bigsqcup$	<code>\bigsqcup</code>	$\int$	$\int$	<code>\intcap</code>	$\Sigma$	$\Sigma$	<code>\sum</code>
$\bigtalloblong$	$\bigtalloblong$	<code>\bigtalloblong</code>	$\int$	$\int$	<code>\intclockwise</code>	$\int$	$\int$	<code>\sumint</code>
$\bigtimes$	$\bigtimes$	<code>\bigtimes</code>	$\int$	$\int$	<code>\intcup</code>	$\int$	$\int$	<code>\upint</code>
$\biguplus$	$\biguplus$	<code>\biguplus</code>	$\int$	$\int$	<code>\intlarhk</code>	$\oint$	$\oint$	<code>\varointclockwise</code>
$\bigvee$	$\bigvee$	<code>\bigvee</code>	$\int$	$\int$	<code>\intx</code>	$\backslash$	$\backslash$	<code>\xbsol</code>
$\bigwedge$	$\bigwedge$	<code>\bigwedge</code>	$\int$	$\int$	<code>\lowint</code>	$/$	$/$	<code>\xsol</code>
$\circlearrowleft$	$\circlearrowleft$	<code>\cirfnint</code>	$\sum$	$\sum$	<code>\modtwosum</code>			

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$\mathbb{A}$   $\mathbb{A}$  `\conjquant`       $\int$   $\int$  `\npolint`

By default, each of the integral-producing commands in Table 90 points to a slanted version of the glyph, as shown. The `upint` package option typesets each integral instead as an upright version. Slanted and upright integrals can be mixed, however, by explicitly using the commands shown in Table 91.

TABLE 91: `stix` Integrals with Explicit Slant

$\int$	$\int$	<code>\ints1</code>	$\int$	$\int$	<code>\intup</code>
$\iint$	$\iint$	<code>\iints1</code>	$\iint$	$\iint$	<code>\iintup</code>
$\iiint$	$\iiint$	<code>\iiints1</code>	$\iiint$	$\iiint$	<code>\iiintup</code>
$\oint$	$\oint$	<code>\ointsl</code>	$\oint$	$\oint$	<code>\ointup</code>
$\oiint$	$\oiint$	<code>\oiintsl</code>	$\oiint$	$\oiint$	<code>\oiintup</code>
$\oiiint$	$\oiiint$	<code>\oiiintsl</code>	$\oiiint$	$\oiiint$	<code>\oiiintup</code>
$\int\!\!\!\int$	$\int\!\!\!\int$	<code>\intclockwises1</code>	$\int\!\!\!\int$	$\int\!\!\!\int$	<code>\intclockwiseup</code>
$\varoint$	$\varoint$	<code>\varointclockwises1</code>	$\varoint$	$\varoint$	<code>\varointclockwiseup</code>
$\oint$	$\oint$	<code>\ointctrclockwises1</code>	$\oint$	$\oint$	<code>\ointctrclockwiseup</code>
$\sumint$	$\sumint$	<code>\sumintsl</code>	$\sumint$	$\sumint$	<code>\sumintup</code>

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$\iiint$	$\iiint$	<code>\iiiintsl</code>	$\iiint$	$\iiint$	<code>\iiiintup</code>
$\int$	$\int$	<code>\intbarsl</code>	$\int$	$\int$	<code>\intbarup</code>
$\neq$	$\neq$	<code>\intBarsl</code>	$\neq$	$\neq$	<code>\intBarup</code>
$\int$	$\int$	<code>\fintsl</code>	$\int$	$\int$	<code>\fintup</code>
$\oint$	$\oint$	<code>\cirfnintsl</code>	$\oint$	$\oint$	<code>\cirfnintup</code>
$\int$	$\int$	<code>\awintsl</code>	$\int$	$\int$	<code>\awintup</code>
$\int$	$\int$	<code>\rppolintsl</code>	$\int$	$\int$	<code>\rppolintup</code>
$\int$	$\int$	<code>\scpolintsl</code>	$\int$	$\int$	<code>\scpolintup</code>
$\int$	$\int$	<code>\npolintsl</code>	$\int$	$\int$	<code>\npolintup</code>
$\oint$	$\oint$	<code>\pointintsl</code>	$\oint$	$\oint$	<code>\pointintup</code>
$\int$	$\int$	<code>\sqintsl</code>	$\int$	$\int$	<code>\sqintup</code>
$\int$	$\int$	<code>\intlarhksl</code>	$\int$	$\int$	<code>\intlarhkup</code>
$\int$	$\int$	<code>\intxsl</code>	$\int$	$\int$	<code>\intxup</code>
$\int$	$\int$	<code>\intcapsl</code>	$\int$	$\int$	<code>\intcapup</code>
$\int$	$\int$	<code>\intcupsl</code>	$\int$	$\int$	<code>\intcupup</code>
$\int$	$\int$	<code>\upintsl</code>	$\int$	$\int$	<code>\upintup</code>

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$$\int \int \quad \backslash\text{lowintsl} \qquad \int \int \quad \backslash\text{lowintup}$$

Instead of using the preceding symbols directly, it is generally preferable to use the symbols listed in Table 90 either with or without the `upint` package option. Specifying `upint` selects each integral's upright (`up`) variant, while omitting `upint` selects each integral's slanted (`sl`) variant. Use the symbols shown in Table 91 only when you need to include both upright and slanted variations of a symbol in the same document.

TABLE 92: `cmupint` Variable-sized Upright Integrals

$\oint$	$\oint$	<code>\awint</code>	$\oint$	$\oint$	<code>\npolint</code>
$\bar{\int}$	$\bar{\int}$	<code>\barint</code>	$\oiint$	$\oiint$	<code>\oiint</code>
$\oint$	$\oint$	<code>\cirfnint</code>	$\oiint$	$\oiint$	<code>\oiint</code>
$\bar{\int}$	$\bar{\int}$	<code>\doublebarint</code>	$\oint$	$\oint$	<code>\oint</code>
$\int$	$\int$	<code>\downint</code>	$\oint$	$\oint$	<code>\ointclockwise</code>
$\int$	$\int$	<code>\fint</code>	$\oint$	$\oint$	<code>\ointctrlockwise</code>
$\int \cdots \int$	$\int \cdots \int$	<code>\idotsint*</code>	$\oint$	$\oint$	<code>\pointint</code>
$\iiint$	$\iiint$	<code>\iiint</code>	$\int$	$\int$	<code>\rppolint</code>
$\iiint$	$\iiint$	<code>\iiint</code>	$\int$	$\int$	<code>\scpolint</code>

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$\iint$	$\iint$	<code>\iint</code>	$\oiint$	$\oiint$	<code>\oiint</code>
$\int$	$\int$	<code>\int</code>	$\oint$	$\oint$	<code>\oint</code>
$\oint$	$\oint$	<code>\intcap</code>	$\sumint$	$\sumint$	<code>\sumint</code>
$\int$	$\int$	<code>\intclockwise</code>	$\upint$	$\upint$	<code>\upint</code>
$\int$	$\int$	<code>\intcup</code>	$\int\cdots\int$	$\int\cdots\int$	<code>\varidotsint*</code>
$\int$	$\int$	<code>\intlarhk</code>	$\oint$	$\oint$	<code>\varointclockwise</code>
$\int$	$\int$	<code>\landdownint</code>	$\oint$	$\oint$	<code>\varointctrlockwise</code>
$\int$	$\int$	<code>\landupint</code>	$\int$	$\int$	<code>\xint</code>

`cmupint` additionally provides `\longint`, `\longiint`, `\longoint`, and `\longoint` commands that stretch arbitrarily tall. See the `cmupint` documentation for more information.

\* `\varidotsint` is always drawn as is. `\idotsint` is drawn identically to `\varidotsint` when `amsmath` is not loaded or with more space surrounding each dot when `amsmath` is loaded.

TABLE 93: `mathdesign` Variable-sized Math Operators

$\int$	$\int$	<code>\intclockwise</code>	$\oint$	$\oint$	<code>\ointclockwise</code>
$\oiint$	$\oiint$	<code>\oiint</code>	$\oint$	$\oint$	<code>\ointctrlockwise</code>
$\oiint$	$\oiint$	<code>\oiint</code>			

The `mathdesign` package provides three versions of each integral—in fact, of every symbol—to accompany different text fonts: Utopia ( $\int$ ), Garamond ( $\int$ ), and Charter ( $\int$ ).

TABLE 94: pdfMsym Variable-sized Math Operators

$f$	$\int$	<code>\aint</code>	$\forall$	$\bigvee$	<code>\bigforall</code>
$\bigcirc$	$\bigwedge$	<code>\bigcircwedge</code>	$\int$	$\int$	<code>\biNint{5}</code> *
$\bigcup$	$\bigcup$	<code>\bigdcup</code>	$\int$	$\int$	<code>\iNint{5}</code> *
$\bigwedge$	$\bigwedge$	<code>\bigdwedge</code>	$\int$	$\int$	<code>\oiNint{5}</code> *
$\exists$	$\exists$	<code>\bigexists</code>			

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

\* These commands have a required argument, which specifies the number of integrals. For example, `\oiNint{7}` produces the symbol

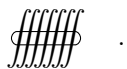


TABLE 95: prodint Variable-sized Math Operators

$\prod$	<code>\prodi</code>	$\prod$	<code>\Prodi</code>	$\prod$	<code>\PRODI</code>
---------	---------------------	---------	---------------------	---------	---------------------

prodint currently requires the author to manually specify `\prodi` for inlined expressions ( $\dots$ ), `\Prodi` for displayed math ( $\displaystyle \dots$ ), and `\PRODI` for displayed math involving tall integrands. The package does not define a product integral command that scales automatically akin to the symbols in Table 79.

TABLE 96: pdfMsym Extensible Math Operators

$$\prod \quad \backslash\text{prood} \quad \sum \quad \backslash\text{suum}$$

These symbols extend horizontally to fit their lower and upper limits. Hence,

$$\backslash\text{suum}_{\{i=\lfloor\sqrt{a^2+b^2+c^2}\rfloor\}^{\{\max(5N-3, 11N-8)\}}}$$

produces

$$\sum_{i=\lfloor\sqrt{a^2+b^2+c^2}\rfloor}^{\max(5N-3, 11N-8)} .$$

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

TABLE 97: cml Large Math Operators

$$\wp \quad \backslash\text{bigparr}^* \quad \& \quad \backslash\text{bigwith}$$

\* cml defines `\beginvamp` as a synonym for `\bigparr`.

TABLE 98: Binary Relations

$\approx$	<code>\approx</code>	$\equiv$	<code>\equiv</code>	$\perp$	<code>\perp</code>	$\smile$	<code>\smile</code>
$\asymp$	<code>\asymp</code>	$\frown$	<code>\frown</code>	$\prec$	<code>\prec</code>	$\succ$	<code>\succ</code>
$\bowtie$	<code>\bowtie</code>	$\Join$	<code>\Join</code> *	$\preceq$	<code>\preceq</code>	$\succeq$	<code>\succeq</code>
$\cong$	<code>\cong</code>	$\mid$	<code>\mid</code> <sup>†</sup>	$\propto$	<code>\propto</code>	$\vdash$	<code>\vdash</code>
$\dashv$	<code>\dashv</code>	$\models$	<code>\models</code>	$\sim$	<code>\sim</code>		
$\doteq$	<code>\doteq</code>	$\parallel$	<code>\parallel</code>	$\simeq$	<code>\simeq</code>		

\* Not predefined by the L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> core. Use the `latexsym` package to expose this symbol.

<sup>†</sup> The difference between `\mid` and `|` is that the former is a binary relation while the latter is a math ordinal. Consequently, L<sup>A</sup>T<sub>E</sub>X typesets the two with different surrounding spacing. Contrast “P(A | B)”  $\mapsto$  “P(A|B)” with “P(A \mid B)”  $\mapsto$  “P(A | B)”.

TABLE 99:  $\mathcal{AMS}$  Binary Relations

$\approx$	<code>\approxeq</code>	<code>\eqcirc</code>	$\approx$	<code>\succapprox</code>	
$\ni$	<code>\backepsilon</code>	<code>\fallingdotseq</code>	$\approx$	<code>\succcurlyeq</code>	
	<code>\backsim</code>	<code>\multimap</code>		<code>\succsim</code>	
	<code>\backsimeq</code>	<code>\pitchfork</code>		<code>\therefore</code>	
	<code>\because</code>	$\approx$	<code>\precapprox</code>	$\approx$	<code>\thickapprox</code>
	<code>\between</code>	<code>\preccurlyeq</code>	$\approx$	<code>\thicksim</code>	
	<code>\Bumpeq</code>	<code>\precsim</code>		<code>\varpropto</code>	
	<code>\bumpeq</code>	<code>\risingdotseq</code>		<code>\Vdash</code>	
	<code>\circeq</code>	<code>\shortmid</code>		<code>\vDash</code>	
	<code>\curlyeqprec</code>	<code>\shortparallel</code>		<code>\Vdash</code>	
	<code>\curlyeqsucc</code>	<code>\smallfrown</code>			
	<code>\doteqdot</code>	<code>\smallsmile</code>			

TABLE 100:  $\mathcal{AMS}$  Negated Binary Relations

$\ncong$	<code>\ncong</code>	$\nshortparallel$	<code>\nshortparallel</code>	$\nVDash$	<code>\nVDash</code>
$\nmid$	<code>\nmid</code>	$\nsim$	<code>\nsim</code>	$\precnapprox$	<code>\precnapprox</code>
$\nparallel$	<code>\nparallel</code>	$\nsucc$	<code>\nsucc</code>	$\precnsim$	<code>\precnsim</code>
$\nprec$	<code>\nprec</code>	$\nsucceq$	<code>\nsucceq</code>	$\succnapprox$	<code>\succnapprox</code>
$\npreceq$	<code>\npreceq</code>	$\nVDash$	<code>\nVDash</code>	$\succnsim$	<code>\succnsim</code>
$\nshortmid$	<code>\nshortmid</code>	$\nvdash$	<code>\nvdash</code>		

TABLE 101: `stmaryrd` Binary Relations

$\in$	<code>\inplus</code>	$\ni$	<code>\niplus</code>
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TABLE 102: `wasysym` Binary Relations

$\neg$	<code>\invneg</code>	$\leadsto$	<code>\leadsto</code>	$\propto$	<code>\wasypropto</code>
$\Join$	<code>\Join</code>	$\otimes$	<code>\logof</code>		

TABLE 103: txfonts/pxfonts Binary Relations

$\odot$	<code>\circledgtr</code>	$\times$	<code>\lJoin</code>	$\times$	<code>\opentimes</code>
$\odot$	<code>\circledless</code>	$\times$	<code>\lrtimes</code>	$\perp$	<code>\Perp</code>
$\approx$	<code>\colonapprox</code>		<code>\multimap</code>	$\preceq$	<code>\preceqq</code>
$\approx$	<code>\Colonapprox</code>	$\circ$	<code>\multimapboth</code>	$\preceq$	<code>\precneqq</code>
$\dashv$	<code>\coloneq</code>	$\circ$	<code>\multimapbothvert</code>	$\times$	<code>\rJoin</code>
$\dashv$	<code>\Coloneq</code>	$\bullet$	<code>\multimapdot</code>	$\curlywedge$	<code>\strictfi</code>
$\doteq$	<code>\Coloneqq</code>	$\bullet$	<code>\multimapdotboth</code>	$\curlywedge$	<code>\strictif</code>
$\doteq$	<code>\coloneqq*</code>	$\circ$	<code>\multimapdotbothA</code>	$\curlywedge$	<code>\strictiff</code>
$\doteq$	<code>\Colonsim</code>	$\circ$	<code>\multimapdotbothAvert</code>	$\succeq$	<code>\succeqq</code>
$\doteq$	<code>\colonsim</code>	$\bullet$	<code>\multimapdotbothB</code>	$\succeq$	<code>\succneqq</code>
$\doteq$	<code>\Eqcolon</code>	$\circ$	<code>\multimapdotbothBvert</code>	$\parallel$	<code>\varparallel</code>
$\doteq$	<code>\eqcolon</code>	$\circ$	<code>\multimapdotbothvert</code>	$\parallel$	<code>\varparallelinv</code>
$\doteq$	<code>\eqqcolon</code>	$\bullet$	<code>\multimapdotinv</code>	$\Vdash$	<code>\VvDash</code>
$\doteq$	<code>\Eqqqcolon</code>	$\circ$	<code>\multimapinv</code>		
$\doteq$	<code>\eqsim</code>	$\times$	<code>\openJoin</code>		

\* As an alternative to using txfonts/pxfonts, a “:=” symbol can be constructed with “`\mathrel{\mathop:}=`”.

TABLE 104: txfonts/pxfonts Negated Binary Relations

$\napprox$	<code>\napproxeq</code>	$\napprox$	<code>\npreccurlyeq</code>	$\napprox$	<code>\nthickapprox</code>
$\nasymp$	<code>\nasymp</code>	$\napprox$	<code>\npreceqq</code>	$\nrightarrow$	<code>\ntwoheadleftarrow</code>
$\nbacksim$	<code>\nbacksim</code>	$\napprox$	<code>\nprecsim</code>	$\nrightarrow$	<code>\ntwoheadrightarrow</code>
$\nbacksimeq$	<code>\nbacksimeq</code>	$\napprox$	<code>\nsimeq</code>	$\nparallel$	<code>\nvarparallel</code>
$\nbumpeq$	<code>\nbumpeq</code>	$\napprox$	<code>\nsuccapprox</code>	$\nparallel$	<code>\nvarparallelinv</code>
$\nBumpeq$	<code>\nBumpeq</code>	$\napprox$	<code>\nsucccurlyeq</code>	$\nVdash$	<code>\nVdash</code>
$\nequiv$	<code>\nequiv</code>	$\napprox$	<code>\nsucceqq</code>		
$\nprecapprox$	<code>\nprecapprox</code>	$\napprox$	<code>\nsuccsim</code>		

TABLE 105: mathabx Binary Relations

$\between$	<code>\between</code>	$\mid$	<code>\divides</code>	$\risingdotseq$	<code>\risingdotseq</code>
$\botdoteq$	<code>\botdoteq</code>	$\dot{=}$	<code>\dotseq</code>	$\succapprox$	<code>\succapprox</code>
$\Bumpedeq$	<code>\Bumpedeq</code>	$\curlyeq$	<code>\eqbumped</code>	$\succcurlyeq$	<code>\succcurlyeq</code>
$\bumpedeq$	<code>\bumpedeq</code>	$\circ$	<code>\eqcirc</code>	$\succdot$	<code>\succdot</code>
$\circeq$	<code>\circeq</code>	$\doteq$	<code>\eqcolon</code>	$\succsim$	<code>\succsim</code>
$\coloneq$	<code>\coloneq</code>	$\fallingdotseq$	<code>\fallingdotseq</code>	$\therefore$	<code>\therefore</code>
$\corresponds$	<code>\corresponds</code>	$\ggcurly$	<code>\ggcurly</code>	$\topdoteq$	<code>\topdoteq</code>
$\curlyeqprec$	<code>\curlyeqprec</code>	$\llcurly$	<code>\llcurly</code>	$\vDash$	<code>\vDash</code>
$\curlyeqsucc$	<code>\curlyeqsucc</code>	$\succapprox$	<code>\precapprox</code>	$\Vdash$	<code>\Vdash</code>
$\DashV$	<code>\DashV</code>	$\preccurlyeq$	<code>\preccurlyeq</code>	$\VDash$	<code>\VDash</code>
$\Dashv$	<code>\Dashv</code>	$\precdot$	<code>\precdot</code>	$\Vdash$	<code>\Vdash</code>
$\dashVv$	<code>\dashVv</code>	$\prec\sim$	<code>\prec\sim</code>		

TABLE 106: mathabx Negated Binary Relations

$\approx$	<code>\napprox</code>	$\nperp$	<code>\notperp</code>	$\nVDash$	<code>\nvDash</code>
$\cong$	<code>\ncong</code>	$\nprec$	<code>\nprec</code>	$\nVDash$	<code>\nVDash</code>
$\curlyeqprec$	<code>\ncurlyeqprec</code>	$\nprecapprox$	<code>\nprecapprox</code>	$\nVDash$	<code>\nVDash</code>
$\curlyeqsucc$	<code>\ncurlyeqsucc</code>	$\npreccurlyeq$	<code>\npreccurlyeq</code>	$\nvdash$	<code>\nvdash</code>
$\nDashv$	<code>\nDashv</code>	$\npreceq$	<code>\npreceq</code>	$\nVdash$	<code>\nVdash</code>
$\ndashV$	<code>\ndashV</code>	$\nprecsim$	<code>\nprecsim</code>	$\napprox$	<code>\precnapprox</code>
$\ndashv$	<code>\ndashv</code>	$\nsim$	<code>\nsim</code>	$\nprecneq$	<code>\precneq</code>
$\nDashV$	<code>\nDashV</code>	$\nsimeq$	<code>\nsimeq</code>	$\nprecnsim$	<code>\precnsim</code>
$\ndashVv$	<code>\ndashVv</code>	$\nsucc$	<code>\nsucc</code>	$\nsuccapprox$	<code>\succapprox</code>
$\neq$	<code>\neq</code>	$\nsuccapprox$	<code>\nsuccapprox</code>	$\succneq$	<code>\succneq</code>
$\notasymp$	<code>\notasymp</code>	$\nsucccurlyeq$	<code>\nsucccurlyeq</code>	$\succnsim$	<code>\succnsim</code>
$\notdivides$	<code>\notdivides</code>	$\nsucceq$	<code>\nsucceq</code>		
$\notequiv$	<code>\notequiv</code>	$\nsuccsim$	<code>\nsuccsim</code>		

The `\changenotsign` command toggles the behavior of `\not` to produce either a vertical or a diagonal slash through a binary operator. Thus, “`\$a \not= b\$`” can be made to produce either “ $a \nneq b$ ” or “ $a \neq b$ ”.

TABLE 107: MnSymbol Binary Relations

$\approx$	<code>\approx</code>	$\hateq$	<code>\hateq</code>	$\rightpropto$	<code>\rightpropto</code>
$\approxeq$	<code>\approxeq</code>	$\hcrossing$	<code>\hcrossing</code>	$\rightslice$	<code>\rightslice</code>
$\backapprox$	<code>\backapprox</code>	$\leftfootline$	<code>\leftfootline</code>	$\rightVdash$	<code>\rightVdash</code>
$\backapproxeq$	<code>\backapproxeq</code>	$\leftfree$	<code>\leftfree</code>	$\rightvdash$	<code>\rightvdash</code>
$\backcong$	<code>\backcong</code>	$\leftmodels$	<code>\leftmodels</code>	$\risingdotseq$	<code>\risingdotseq</code>
$\backeqsim$	<code>\backeqsim</code>	$\leftModels$	<code>\leftModels</code>	$\sefootline$	<code>\sefootline</code>
$\backsim$	<code>\backsim</code>	$\leftpropto$	<code>\leftpropto</code>	$\sefree$	<code>\sefree</code>
$\backsimeq$	<code>\backsimeq</code>	$\lefttrightline$	<code>\lefttrightline</code>	$\seModels$	<code>\seModels</code>
$\backtriplesim$	<code>\backtriplesim</code>	$\Leftrightline$	<code>\Leftrightline</code>	$\semodels$	<code>\semodels</code>
$\between$	<code>\between</code>	$\leftslice$	<code>\leftslice</code>	$\separated$	<code>\separated</code>
$\bumpeq$	<code>\bumpeq</code>	$\leftVdash$	<code>\leftVdash</code>	$\seVdash$	<code>\seVdash</code>
$\Bumpeq$	<code>\Bumpeq</code>	$\leftvdash$	<code>\leftvdash</code>	$\sevdash$	<code>\sevdash</code>
$\circeq$	<code>\circeq</code>	$\nefootline$	<code>\nefootline</code>	$\shortparallel$	<code>\shortparallel</code>
$\closedequal$	<code>\closedequal</code>	$\nefree$	<code>\nefree</code>	$\sim$	<code>\sim</code>
$\closedprec$	<code>\closedprec</code>	$\neModels$	<code>\neModels</code>	$\simeq$	<code>\simeq</code>
$\closedsucc$	<code>\closedsucc</code>	$\nemodels$	<code>\nemodels</code>	$\succ$	<code>\succ</code>
$\coloneq$	<code>\coloneq</code>	$\neswline$	<code>\neswline</code>	$\succapprox$	<code>\succapprox</code>
$\cong$	<code>\cong</code>	$\Neswline$	<code>\Neswline</code>	$\succcurlyeq$	<code>\succcurlyeq</code>
$\curlyeqprec$	<code>\curlyeqprec</code>	$\neVdash$	<code>\neVdash</code>	$\succeq$	<code>\succeq</code>
$\curlyeqsucc$	<code>\curlyeqsucc</code>	$\nevDash$	<code>\nevDash</code>	$\succsim$	<code>\succsim</code>

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$\doteq$	<code>\Doteq</code>	$\diagdown$	<code>\nwfootline</code>	$\swarrow$	<code>\swfootline</code>
$\doteq$	<code>\doteq</code>	$\diagdown$	<code>\nwfree</code>	$\swarrow$	<code>\swfree</code>
$\downarrow$	<code>\downfootline</code>	$\searrow$	<code>\nwmodels</code>	$\searrow$	<code>\swModels</code>
$\downarrow$	<code>\downfree</code>	$\searrow$	<code>\nwModels</code>	$\searrow$	<code>\swmodels</code>
$\Downarrow$	<code>\downmodels</code>	$\times$	<code>\nwsecrossing</code>	$\searrow$	<code>\swVdash</code>
$\Downarrow$	<code>\downModels</code>	$\parallel$	<code>\Nwseline</code>	$\searrow$	<code>\swvdash</code>
$\Downarrow$	<code>\downpropto</code>	$\diagdown$	<code>\nwseline</code>	$\approx$	<code>\triplesim</code>
$\Downarrow$	<code>\downvdash</code>	$\searrow$	<code>\nwvdash</code>	$ $	<code>\updownline</code>
$\Downarrow$	<code>\downVdash</code>	$\searrow$	<code>\nwVdash</code>	$\parallel$	<code>\Updownline</code>
$\bumpeq$	<code>\eqbump</code>	$<$	<code>\prec</code>	$\uparrow$	<code>\upfootline</code>
$\approx$	<code>\eqcirc</code>	$\approx$	<code>\precapprox</code>	$\uparrow$	<code>\upfree</code>
$\dot{=}$	<code>\eqdot</code>	$\approx$	<code>\preccurlyeq</code>	$\parallel$	<code>\upModels</code>
$\approx$	<code>\eqsim</code>	$\leq$	<code>\preceq</code>	$\parallel$	<code>\upmodels</code>
$=$	<code>\equal</code>	$\approx$	<code>\precsim</code>	$\approx$	<code>\uppropto</code>
$\square$	<code>\equalclosed</code>	$\dashv$	<code>\rightfootline</code>	$\perp$	<code>\upvdash</code>
$\equiv$	<code>\equiv</code>	$\rightarrow$	<code>\rightfree</code>	$\perp$	<code>\upVdash</code>
$\square$	<code>\equivclosed</code>	$\models$	<code>\rightmodels</code>	$\times$	<code>\vcrossing</code>
$\fallingdotseq$	<code>\fallingdotseq</code>	$\models$	<code>\rightModels</code>	$\parallel$	<code>\Vdash</code>

MnSymbol additionally defines synonyms for some of the preceding symbols:

$\dashv$	<code>\dashv</code>	(same as <code>\leftvdash</code> )
$\diagdown$	<code>\diagdown</code>	(same as <code>\nwseline</code> )
$\diagup$	<code>\diagup</code>	(same as <code>\neswline</code> )
$ $	<code>\divides</code>	(same as <code>\updownline</code> )
$\dot{=}$	<code>\doteqdot</code>	(same as <code>\Doteq</code> )
$\models$	<code>\models</code>	(same as <code>\rightmodels</code> )
$\parallel$	<code>\parallel</code>	(same as <code>\Updownline</code> )
$\perp$	<code>\perp</code>	(same as <code>\upvdash</code> )
$\propto$	<code>\propto</code>	(same as <code>\leftpropto</code> )
$\text{---}$	<code>\relbar</code>	(same as <code>\leftrightline</code> )
$\text{=}$	<code>\Relbar</code>	(same as <code>\Leftrightarrow</code> )
$\propto$	<code>\varpropto</code>	(same as <code>\leftpropto</code> )
$\models$	<code>\vDash</code>	(same as <code>\rightmodels</code> )
$\models$	<code>\VDash</code>	(same as <code>\rightModels</code> )
$\vdash$	<code>\vdash</code>	(same as <code>\rightvdash</code> )
$\Vdash$	<code>\Vdash</code>	(same as <code>\rightVdash</code> )

TABLE 108: MnSymbol Negated Binary Relations

$\napprox$	<code>\napprox</code>	$\nleftfootline$	<code>\nleftfootline</code>	$\nrisingdotseq$	<code>\nrisingdotseq</code>
$\napproxeq$	<code>\napproxeq</code>	$\nleftfree$	<code>\nleftfree</code>	$\nsefootline$	<code>\nsefootline</code>
$\nbackapprox$	<code>\nbackapprox</code>	$\nleftmodels$	<code>\nleftmodels</code>	$\nsefree$	<code>\nsefree</code>
$\nbackapproxeq$	<code>\nbackapproxeq</code>	$\nleftModels$	<code>\nleftModels</code>	$\nseModels$	<code>\nseModels</code>
$\nbackcong$	<code>\nbackcong</code>	$\nleftrightline$	<code>\nleftrightline</code>	$\nsemodels$	<code>\nsemodels</code>
$\nbackeqsim$	<code>\nbackeqsim</code>	$\nLefttrightline$	<code>\nLefttrightline</code>	$\nsevdash$	<code>\nsevdash</code>
$\nbacksim$	<code>\nbacksim</code>	$\nleftvdash$	<code>\nleftvdash</code>	$\nseVdash$	<code>\nseVdash</code>
$\nbacksimeq$	<code>\nbacksimeq</code>	$\nleftVdash$	<code>\nleftVdash</code>	$\nshortmid$	<code>\nshortmid</code>
$\nbacktripleseq$	<code>\nbacktripleseq</code>	$\nnefootline$	<code>\nnefootline</code>	$\nshortparallel$	<code>\nshortparallel</code>
$\nbumpeq$	<code>\nbumpeq</code>	$\nnefree$	<code>\nnefree</code>	$\nsim$	<code>\nsim</code>
$\nBumpeq$	<code>\nBumpeq</code>	$\nnemodels$	<code>\nnemodels</code>	$\nsimeq$	<code>\nsimeq</code>
$\ncirceq$	<code>\ncirceq</code>	$\nneModels$	<code>\nneModels</code>	$\nsucc$	<code>\nsucc</code>
$\nclosedequal$	<code>\nclosedequal</code>	$\nneswline$	<code>\nneswline</code>	$\nsuccapprox$	<code>\nsuccapprox</code>
$\ncong$	<code>\ncong</code>	$\nNeswline$	<code>\nNeswline</code>	$\nsucccurlyeq$	<code>\nsucccurlyeq</code>
$\ncurlyeqprec$	<code>\ncurlyeqprec</code>	$\nnevDash$	<code>\nnevDash</code>	$\nsucceq$	<code>\nsucceq</code>
$\ncurlyeqsucc$	<code>\ncurlyeqsucc</code>	$\nnevDash$	<code>\nnevDash</code>	$\nsuccsim$	<code>\nsuccsim</code>
$\ndoteq$	<code>\ndoteq</code>	$\nnwfootline$	<code>\nnwfootline</code>	$\nswfootline$	<code>\nswfootline</code>
$\nDoteq$	<code>\nDoteq</code>	$\nnwfree$	<code>\nnwfree</code>	$\nswfree$	<code>\nswfree</code>
$\ndownfootline$	<code>\ndownfootline</code>	$\nnwmodels$	<code>\nnwmodels</code>	$\nswModels$	<code>\nswModels</code>
$\ndownfree$	<code>\ndownfree</code>	$\nnwModels$	<code>\nnwModels</code>	$\nswmodels$	<code>\nswmodels</code>
$\ndownModels$	<code>\ndownModels</code>	$\nNwseline$	<code>\nNwseline</code>	$\nswvdash$	<code>\nswvdash</code>
$\ndownmodels$	<code>\ndownmodels</code>	$\nnwseline$	<code>\nnwseline</code>	$\nswVdash$	<code>\nswVdash</code>
$\ndownVdash$	<code>\ndownVdash</code>	$\nnwvdash$	<code>\nnwvdash</code>	$\ntripleseq$	<code>\ntripleseq</code>
$\ndownvdash$	<code>\ndownvdash</code>	$\nnwVdash$	<code>\nnwVdash</code>	$\nUpdownline$	<code>\nUpdownline</code>
$\neqbump$	<code>\neqbump</code>	$\nprec$	<code>\nprec</code>	$\nupdownline$	<code>\nupdownline</code>
$\neqcirc$	<code>\neqcirc</code>	$\nprecapprox$	<code>\nprecapprox</code>	$\nupfootline$	<code>\nupfootline</code>
$\neqdot$	<code>\neqdot</code>	$\npreccurlyeq$	<code>\npreccurlyeq</code>	$\nupfree$	<code>\nupfree</code>
$\neqsim$	<code>\neqsim</code>	$\npreceq$	<code>\npreceq</code>	$\nupModels$	<code>\nupModels</code>
$\nequal$	<code>\nequal</code>	$\nprecsim$	<code>\nprecsim</code>	$\nupmodels$	<code>\nupmodels</code>
$\nequalclosed$	<code>\nequalclosed</code>	$\nrightfootline$	<code>\nrightfootline</code>	$\nupVdash$	<code>\nupVdash</code>
$\nequiv$	<code>\nequiv</code>	$\nrighfree$	<code>\nrighfree</code>	$\nupvdash$	<code>\nupvdash</code>
$\nequivclosed$	<code>\nequivclosed</code>	$\nrighModels$	<code>\nrighModels</code>	$\precnapprox$	<code>\precnapprox</code>
$\neswcrossing$	<code>\neswcrossing</code>	$\nrighmodels$	<code>\nrighmodels</code>	$\precnsim$	<code>\precnsim</code>
$\nfallingdotseq$	<code>\nfallingdotseq</code>	$\nrighvdash$	<code>\nrighvdash</code>	$\succnapprox$	<code>\succnapprox</code>
$\nhateq$	<code>\nhateq</code>	$\nrighVdash$	<code>\nrighVdash</code>	$\succnsim$	<code>\succnsim</code>

MnSymbol additionally defines synonyms for some of the preceding symbols:

$\#$	<code>\ndashv</code>	(same as <code>\nleftvdash</code> )
$\times$	<code>\ndiagdown</code>	(same as <code>\nnwseline</code> )
$\times$	<code>\ndiagup</code>	(same as <code>\nneswline</code> )
$\dagger$	<code>\ndivides</code>	(same as <code>\nupdownline</code> )
$\neq$	<code>\ne</code>	(same as <code>\nequal</code> )
$\neq$	<code>\neq</code>	(same as <code>\nequal</code> )
$\dagger$	<code>\nmid</code>	(same as <code>\nupdownline</code> )
$\#$	<code>\nmodels</code>	(same as <code>\nrightmodels</code> )
$\#$	<code>\nparallel</code>	(same as <code>\nUpdownline</code> )
$\perp$	<code>\nperp</code>	(same as <code>\nupvdash</code> )
$\dashv$	<code>\nrelbar</code>	(same as <code>\nleftrightline</code> )
$\neq$	<code>\nRelbar</code>	(same as <code>\nLeftrightarrow</code> )
$\#$	<code>\nvDash</code>	(same as <code>\nrightmodels</code> )
$\#$	<code>\nvdash</code>	(same as <code>\nrightvdash</code> )
$\#$	<code>\nVDash</code>	(same as <code>\nrightVdash</code> )
$\#$	<code>\nVDash</code>	(same as <code>\nrightModels</code> )

TABLE 109: fdsymbol Binary Relations

$\approx$	<code>\approx</code>	$\equiv$	<code>\equiv</code>	$\vDash$	<code>\rightmodels</code>
$\approx$	<code>\approxeq</code>	$\fallingdotseq$	<code>\fallingdotseq</code>	$\Vdash$	<code>\rightVdash</code>
$\cong$	<code>\backcong</code>	$\frown$	<code>\frown</code>	$\Vdash$	<code>\rightVDash</code>
$\propto$	<code>\backpropto</code>	$\frown$	<code>\frowneq</code>	$\vdash$	<code>\rightvdash</code>
$\sim$	<code>\backsim</code>	$\smile$	<code>\frownsmile</code>	$\Vdash$	<code>\rightvDash</code>
$\simeq$	<code>\backsimeq</code>	$\in$	<code>\in</code>	$\fallingdotseq$	<code>\risingdotseq</code>
$\between$	<code>\between</code>	$\dashv$	<code>\leftassert</code>	$\mid$	<code>\shortmid</code>
$\bowtie$	<code>\bowtie</code>	$\dashv$	<code>\leftAssert</code>	$\parallel$	<code>\shortparallel</code>
$\bumpeq$	<code>\bumpeq</code>	$\vdash$	<code>\leftfootline</code>	$\sim$	<code>\sim</code>
$\Bumpeq$	<code>\Bumpeq</code>	$\dashv$	<code>\leftmodels</code>	$\simeq$	<code>\simeq</code>
$\bumpeq$	<code>\bumpeq</code>	$\vdash$	<code>\leftvdash</code>	$\smile$	<code>\smile</code>
$\circeq$	<code>\circeq</code>	$\dashv$	<code>\leftvDash</code>	$\smileeq$	<code>\smileeq</code>
$\coloneq$	<code>\coloneq</code>	$\dashv$	<code>\leftVDash</code>	$\smilefrown$	<code>\smilefrown</code>
$\cong$	<code>\cong</code>	$\dashv$	<code>\leftVDash</code>	$\stareq$	<code>\stareq</code>
$\crossing$	<code>\crossing</code>	$\vdash$	<code>\longleftfootline</code>	$\succ$	<code>\succ</code>
$\curlyeqprec$	<code>\curlyeqprec</code>	$\Leftarrow$	<code>\Longmapsfrom</code>	$\succapprox$	<code>\succapprox</code>
$\curlyeqsucc$	<code>\curlyeqsucc</code>	$\rightarrow$	<code>\longmapsfrom</code>	$\succcurlyeq$	<code>\succcurlyeq</code>
$\dashv$	<code>\dashv</code>	$\vdash$	<code>\longrightfootline</code>	$\succeq$	<code>\succeq</code>
$\Ddashv$	<code>\Ddashv</code>	$\mid$	<code>\mid</code>	$\succeqq$	<code>\succeqq</code>
$\dot{\cong}$	<code>\dotcong</code>	$\owns$	<code>\owns</code>	$\succsim$	<code>\succsim</code>
$\doteq$	<code>\doteq</code>	$\parallel$	<code>\parallel</code>	$\thickapprox$	<code>\thickapprox</code>
$\doteq$	<code>\Doteq</code>	$\prec$	<code>\prec</code>	$\thicksim$	<code>\thicksim</code>
$\dotsminusdots$	<code>\dotsminusdots</code>	$\approx$	<code>\precapprox</code>	$\tripleapprox$	<code>\tripleapprox</code>
$\Downarrow$	<code>\downAssert</code>	$\asymp$	<code>\preccurlyeq</code>	$\Uparrow$	<code>\upassert</code>

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$\top$	<code>\downassert</code>	$\preceq$	<code>\preceq</code>	$\perp$	<code>\upAssert</code>
$\pi$	<code>\downmodels</code>	$\preceqq$	<code>\preceqq</code>	$\upmodels$	<code>\upmodels</code>
$\bar{\pi}$	<code>\downvDash</code>	$\preccurlyeq$	<code>\preccurlyeq</code>	$\upvdash$	<code>\upvdash</code>
$\bar{\top}$	<code>\downVDash</code>	$\precneq$	<code>\precneq</code>	$\upvDash$	<code>\upvDash</code>
$\top$	<code>\downvdash</code>	$\precneqq$	<code>\precneqq</code>	$\upVdash$	<code>\upVdash</code>
$\bar{\top}$	<code>\downVDash</code>	$\precnsim$	<code>\precnsim</code>	$\upVDash$	<code>\upVDash</code>
$\#$	<code>\eqcirc</code>	$\precsim$	<code>\precsim</code>	$\Vdash$	<code>\Vdash</code>
$:=$	<code>\eqcolon</code>	$\propto$	<code>\propto</code>	$\veeeq$	<code>\veeeq</code>
$\dot{=}$	<code>\eqdot</code>	$\vdash$	<code>\rightassert</code>	$\Vdash$	<code>\Vdash</code>
$\sim$	<code>\eqsim</code>	$\Vdash$	<code>\rightAssert</code>	$\wedgeq$	<code>\wedgeq</code>
$=$	<code>\equal</code>	$\dashv$	<code>\rightfootline</code>		

fdsymbol defines synonyms for many of the preceding symbols:

$\approx$	<code>\approxident</code>	$\dashv$	<code>\dashv</code>	$\vdash$	<code>\shortrighttack</code>
$\equiv$	<code>\arceq</code>	$\doteqdot$	<code>\doteqdot</code>	$\perp$	<code>\shortuptack</code>
$\Vdash$	<code>\Assert</code>	$:=$	<code>\eqqcolon</code>	$\smallfrown$	<code>\smallfrown</code>
$\vdash$	<code>\assert</code>	$\hat{=}$	<code>\hateq</code>	$\smallsmile$	<code>\smallsmile</code>
$\asymp$	<code>\asymp</code>	$\Join$	<code>\Join</code>	$\varpropto$	<code>\varpropto</code>
$\bar{\top}$	<code>\Barv</code>	$\longdashv$	<code>\longdashv</code>	$\bar{\perp}$	<code>\vBar</code>
$\bar{\pi}$	<code>\barv</code>	$\models$	<code>\models</code>	$\bar{\perp}$	<code>\Vbar</code>
$\subset$	<code>\closure</code>	$\ni$	<code>\ni</code>	$\Vdash$	<code>\vDash</code>
$:=$	<code>\coloneqq</code>	$\perp$	<code>\perp</code>	$\Vdash$	<code>\Vdash</code>
$\dashv$	<code>\dashv</code>	$\propfrom$	<code>\propfrom</code>	$\Vdash$	<code>\Vdash</code>
$\DashV$	<code>\DashV</code>	$\shortdowntack$	<code>\shortdowntack</code>	$\vdash$	<code>\vdash</code>
$\Dashv$	<code>\Dashv</code>	$\shortlefttack$	<code>\shortlefttack</code>	$\longdash$	<code>\longdash</code>

TABLE 110: fdsymbol Negated Binary Relations

$\backsimeqq$	<code>\backsimeqq</code>	$\notin$	<code>\notin</code>	$\nsim$	<code>\nsim</code>
$\napprox$	<code>\napprox</code>	$\nleftAssert$	<code>\nleftAssert</code>	$\nsimeq$	<code>\nsimeq</code>
$\napproxeq$	<code>\napproxeq</code>	$\nleftassert$	<code>\nleftassert</code>	$\nsmile$	<code>\nsmile</code>
$\nbackcong$	<code>\nbackcong</code>	$\nleftfootline$	<code>\nleftfootline</code>	$\nsmileeq$	<code>\nsmileeq</code>
$\nbacksim$	<code>\nbacksim</code>	$\nleftmodels$	<code>\nleftmodels</code>	$\nsmilefrown$	<code>\nsmilefrown</code>
$\nbacksimeq$	<code>\nbacksimeq</code>	$\nleftvDash$	<code>\nleftvDash</code>	$\nstareq$	<code>\nstareq</code>
$\nbumpeq$	<code>\nbumpeq</code>	$\nleftvdash$	<code>\nleftvdash</code>	$\nsucc$	<code>\nsucc</code>
$\nBumpeq$	<code>\nBumpeq</code>	$\nleftVDash$	<code>\nleftVDash</code>	$\nsuccapprox$	<code>\nsuccapprox</code>
$\nbumpeqq$	<code>\nbumpeqq</code>	$\nleftVDash$	<code>\nleftVDash</code>	$\nsucccurlyeq$	<code>\nsucccurlyeq</code>
$\ncirceq$	<code>\ncirceq</code>	$\nlongleftfootline$	<code>\nlongleftfootline</code>	$\nsucceq$	<code>\nsucceq</code>

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$\ncong$	$\ncong$	$\ncong$	$\ncong$	$\ncong$	$\ncong$
$\ncurlyeqprec$	$\nlongmapsfrom$	$\nlongmapsfrom$	$\nlongmapsfrom$	$\nsucceqq$	$\nsucceqq$
$\ncurlyeqsucc$	$\nlongmapsfrom$	$\nlongmapsfrom$	$\nlongmapsfrom$	$\nsuccsim$	$\nsuccsim$
$\ndashVv$	$\nlongrightfootline$	$\nlongrightfootline$	$\nlongrightfootline$	$\ntriplesim$	$\ntriplesim$
$\ndashv$	$\nmid$	$\nmid$	$\nmid$	$\nupassert$	$\nupassert$
$\ndoteq$	$\nowns$	$\nowns$	$\nowns$	$\nupAssert$	$\nupAssert$
$\nDoteq$	$\nparallel$	$\nparallel$	$\nparallel$	$\nupmodels$	$\nupmodels$
$\ndownassert$	$\nprec$	$\nprec$	$\nprec$	$\nupVDash$	$\nupVDash$
$\ndownAssert$	$\nprecapprox$	$\nprecapprox$	$\nprecapprox$	$\nupvDash$	$\nupvDash$
$\ndownmodels$	$\npreccurlyeq$	$\npreccurlyeq$	$\npreccurlyeq$	$\nupVdash$	$\nupVdash$
$\ndownvdash$	$\npreceq$	$\npreceq$	$\npreceq$	$\nupvdash$	$\nupvdash$
$\ndownVdash$	$\npreceqq$	$\npreceqq$	$\npreceqq$	$\nvDash$	$\nvDash$
$\ndownvDash$	$\nprecsim$	$\nprecsim$	$\nprecsim$	$\nvDash$	$\nvDash$
$\neqcirc$	$\nrightassert$	$\nrightassert$	$\nrightassert$	$\nvDash$	$\nvDash$
$\neqdot$	$\nrightAssert$	$\nrightAssert$	$\nrightAssert$	$\nvDash$	$\nvDash$
$\neqsim$	$\nrightfootline$	$\nrightfootline$	$\nrightfootline$	$\nwedgeq$	$\nwedgeq$
$\nequal$	$\nrightmodels$	$\nrightmodels$	$\nrightmodels$	$\nprecneq$	$\nprecneq$
$\nequiv$	$\nrightvdash$	$\nrightvdash$	$\nrightvdash$	$\nprecneqq$	$\nprecneqq$
$\nfallingdotseq$	$\nrightVdash$	$\nrightVdash$	$\nrightVdash$	$\nsimneq$	$\nsimneq$
$\nfrown$	$\nrightvDash$	$\nrightvDash$	$\nrightvDash$	$\succnapprox$	$\succnapprox$
$\nfrownq$	$\nrightVDash$	$\nrightVDash$	$\nrightVDash$	$\succneq$	$\succneq$
$\nfrownsmile$	$\nrightVdash$	$\nrightVdash$	$\nrightVdash$	$\succneqq$	$\succneqq$
	$\nrisingdotseq$	$\nrisingdotseq$	$\nrisingdotseq$	$\succnsim$	$\succnsim$
	$\nshortmid$	$\nshortmid$	$\nshortmid$		
	$\nshortparallel$	$\nshortparallel$	$\nshortparallel$		

fdsymbol defines synonyms for many of the preceding symbols:

$\napprox$	$\napproxident$	$\ndashV$	$\ndashV$	$\nshortrighttack$	$\nshortrighttack$
$\narceq$	$\ne$	$\ne$	$\ne$	$\nshortuptack$	$\nshortuptack$
$\nAssert$	$\neq$	$\neq$	$\neq$	$\nsime$	$\nsime$
$\nassert$	$\nhateq$	$\nhateq$	$\nhateq$	$\nvBar$	$\nvBar$
$\nasymp$	$\nlongdashv$	$\nlongdashv$	$\nlongdashv$	$\nvBar$	$\nvBar$
$\nBarv$	$\nmodels$	$\nmodels$	$\nmodels$	$\nVdash$	$\nVdash$
$\nbarV$	$\nni$	$\nni$	$\nni$	$\nvDash$	$\nvDash$
$\nclosure$	$\notin$	$\notin$	$\notin$	$\nVDash$	$\nVDash$
$\nDashV$	$\nperp$	$\nperp$	$\nperp$	$\nvdash$	$\nvdash$
$\nDashv$	$\nshortdowntack$	$\nshortdowntack$	$\nshortdowntack$	$\nvlongdash$	$\nvlongdash$
$\ndashv$	$\nshortlefttack$	$\nshortlefttack$	$\nshortlefttack$		

TABLE 111: boisiK Binary Relations

$\approx$	<code>\ac</code>	$\//$	<code>\fatslash</code>	$\curvearrowright$	<code>\scurel</code>
$\approx$	<code>\approxeq</code>	$\ni$	<code>\forkv</code>	$\dashv$	<code>\shortmid</code>
$\arccurlyeq$	<code>\arceq</code>	$\frown$	<code>\frown</code>	$\parallel$	<code>\shortparallel</code>
$\backsimeq$	<code>\backsim</code>	$\ggcurly$	<code>\ggcurly</code>	$\sim$	<code>\simrdots</code>
$\backsimeq$	<code>\backsimeq</code>	$\#$	<code>\hash</code>	$\smile$	<code>\smallfrown</code>
$\in$	<code>\bagmember</code>	$\in$	<code>\inplus</code>	$\smile$	<code>\smallsmile</code>
$\because$	<code>\because</code>	$\kernelcontraction$	<code>\kernelcontraction</code>	$\smile$	<code>\smile</code>
$\between$	<code>\between</code>	$\llcurly$	<code>\llcurly</code>	$\strictfi$	<code>\strictfi</code>
$\bumpeq$	<code>\bumpeq</code>	$\multimap$	<code>\multimap</code>	$\strictif$	<code>\strictif</code>
$\Bumpeq$	<code>\Bumpeq</code>	$\multimapboth$	<code>\multimapboth</code>	$\succapprox$	<code>\succapprox</code>
$\circeq$	<code>\circeq</code>	$\multimapbothvert$	<code>\multimapbothvert</code>	$\succcurlyeq$	<code>\succcurlyeq</code>
$\CircledEq$	<code>\CircledEq</code>	$\multimapdot$	<code>\multimapdot</code>	$\succnapprox$	<code>\succnapprox</code>
$\cong$	<code>\cong</code>	$\multimapdotboth$	<code>\multimapdotboth</code>	$\succneqq$	<code>\succneqq</code>
$\corresponds$	<code>\corresponds</code>	$\multimapdotbothA$	<code>\multimapdotbothA</code>	$\succnsim$	<code>\succnsim</code>
$\curlyeqprec$	<code>\curlyeqprec</code>	$\multimapdotbothAvert$	<code>\multimapdotbothAvert</code>	$\succsim$	<code>\succsim</code>
$\curlyeqsucc$	<code>\curlyeqsucc</code>	$\multimapdotbothB$	<code>\multimapdotbothB</code>	$\therefore$	<code>\therefore</code>
$\dashV$	<code>\dashV</code>	$\multimapdotbothBvert$	<code>\multimapdotbothBvert</code>	$\thickapprox$	<code>\thickapprox</code>
$\DashV$	<code>\DashV</code>	$\multimapdotbothvert$	<code>\multimapdotbothvert</code>	$\thicksim$	<code>\thicksim</code>
$\dashVv$	<code>\dashVv</code>	$\multimapdotinv$	<code>\multimapdotinv</code>	$\topfork$	<code>\topfork</code>
$\dfourier$	<code>\dfourier</code>	$\multimapinv$	<code>\multimapinv</code>	$\triangleq$	<code>\triangleq</code>
$\Dfourier$	<code>\Dfourier</code>	$\niplus$	<code>\niplus</code>	$\#$	<code>\varhash</code>
$\disin$	<code>\disin</code>	$\nisd$	<code>\nisd</code>	$\in$	<code>\varisins</code>
$\doteq$	<code>\doteq</code>	$\Perp$	<code>\Perp</code>	$\ni$	<code>\varnis</code>
$\doteqdot$	<code>\doteqdot</code>	$\pitchfork$	<code>\pitchfork</code>	$\propto$	<code>\varpropto</code>
$\dotminus$	<code>\dotminus</code>	$\precapprox$	<code>\precapprox</code>	$\Vdash$	<code>\Vdash</code>
$\dotsim$	<code>\dotsim</code>	$\preccurlyeq$	<code>\preccurlyeq</code>	$\vDash$	<code>\vDash</code>
$\eqbumped$	<code>\eqbumped</code>	$\precnapprox$	<code>\precnapprox</code>	$\VDash$	<code>\VDash</code>
$\eqcirc$	<code>\eqcirc</code>	$\precneqq$	<code>\precneqq</code>	$\veeeq$	<code>\veeeq</code>
$\eqsim$	<code>\eqsim</code>	$\precnsim$	<code>\precnsim</code>	$\Vvdash$	<code>\Vvdash</code>
$\equalparallel$	<code>\equalparallel</code>	$\precsim$	<code>\precsim</code>	$\ztransf$	<code>\ztransf</code>
$\fallingdotseq$	<code>\fallingdotseq</code>	$\prurel$	<code>\prurel</code>	$\Ztransf$	<code>\Ztransf</code>
$\fatslash$	<code>\fatslash</code>	$\risingdotseq$	<code>\risingdotseq</code>		

TABLE 112: boisiK Negated Binary Relations

$\ncong$	<code>\ncong</code>	$\npreceq$	<code>\npreceq</code>	$\nVDash$	<code>\nVDash</code>
$\neq$	<code>\neq</code>	$\nshortmid$	<code>\nshortmid</code>	$\nVdash$	<code>\nVdash</code>
$\nequiv$	<code>\nequiv</code>	$\nshortparallel$	<code>\nshortparallel</code>	$\nvdash$	<code>\nvdash</code>
$\nmid$	<code>\nmid</code>	$\nsim$	<code>\nsim</code>	$\nvDash$	<code>\nvDash</code>
$\nparallel$	<code>\nparallel</code>	$\nsucc$	<code>\nsucc</code>		
$\nprec$	<code>\nprec</code>	$\nsucceq$	<code>\nsucceq</code>		

TABLE 113: stix Binary Relations

$\approx$	<code>\approx</code>	$\#$	<code>\eqvparl</code>	$\rightarrow$	<code>\rightfishtail</code>
$\approx\approx$	<code>\approxeq</code>	$\equiv$	<code>\fallingdotseq</code>	$\Rightarrow$	<code>\rightimply</code>
$\approx\approx\approx$	<code>\approxeqq</code>	$\bowtie$	<code>\fbowtie</code>	$\rhd$	<code>\righttail</code>
$\approx\approx\approx\approx$	<code>\approxident</code>	$\downarrow$	<code>\forksnot</code>	$\equiv$	<code>\risingdotseq</code>
$\arceq$	<code>\arceq</code>	$\oplus$	<code>\forkv</code>	$\sqcup$	<code>\rsqhook</code>
$\assert$	<code>\assert</code>	$\frown$	<code>\frown</code>	$\rightarrow$	<code>\ruledelayed</code>
$\ast\approx$	<code>\ast\approx</code>	$\Hbar$	<code>\gleichstark</code>	$\surd$	<code>\scurel</code>
$\asymp$	<code>\asymp</code>	$\hat{\approx}$	<code>\hatapprox</code>	$\dagger$	<code>\shortdowntack</code>
$\backcong$	<code>\backcong</code>	$\bullet\circ$	<code>\imageof</code>	$\dagger$	<code>\shortlefttack</code>
$\backsim$	<code>\backsim</code>	$\in$	<code>\in</code>	$\mid$	<code>\shortmid</code>
$\backsimeq$	<code>\backsimeq</code>	$\in\dot{\phantom{e}}$	<code>\isindot</code>	$\parallel$	<code>\shortparallel</code>
$\baggmember$	<code>\baggmember</code>	$\in$	<code>\isinE</code>	$\dagger$	<code>\shortuptack</code>
$\Barv$	<code>\Barv</code>	$\in$	<code>\isinobar</code>	$\sim$	<code>\sim</code>
$\bar{V}$	<code>\bar{V}</code>	$\in$	<code>\isins</code>	$\approx$	<code>\simeq</code>
$\between$	<code>\between</code>	$\in$	<code>\isinvb</code>	$\approx$	<code>\simminussim</code>
$\bNot$	<code>\bNot</code>	$\sim$	<code>\kernelcontraction</code>	$\approx$	<code>\simneqq</code>
$\bowtie$	<code>\bowtie</code>	$\leftarrow$	<code>\leftdbltail</code>	$\sim$	<code>\simrdots</code>
$\Bumpeq$	<code>\Bumpeq</code>	$\rightarrow$	<code>\leftfishtail</code>	$\frown$	<code>\smallfrown</code>
$\bumpeq$	<code>\bumpeq</code>	$\leftarrow$	<code>\lefttail</code>	$\in$	<code>\smallin</code>
$\bumpeq\approx$	<code>\bumpeq\approx</code>	$\bowtie$	<code>\lfbowtie</code>	$\cup$	<code>\smallni</code>
$\cirbot$	<code>\cirbot</code>	$\times$	<code>\lftimes</code>	$\cup$	<code>\smallsmile</code>
$\circeq$	<code>\circeq</code>	$\longdashv$	<code>\longdashv</code>	$\#$	<code>\smeparl</code>
$\cirmid$	<code>\cirmid</code>	$\sqcup$	<code>\lsqhook</code>	$\smile$	<code>\smile</code>
$\closure$	<code>\closure</code>	$\equiv$	<code>\measeq</code>	$\ast$	<code>\stareq</code>
$\Coloneq$	<code>\Coloneq</code>	$\mid$	<code>\mid</code>	$\succ$	<code>\succ</code>
$\coloneq$	<code>\coloneq</code>	$\circ$	<code>\midcir</code>	$\succ$	<code>\Succ</code>
$\cong$	<code>\cong</code>	$\ni$	<code>\mlcp</code>	$\approx$	<code>\succapprox</code>
$\cong\dot{\phantom{c}}$	<code>\cong\dot{\phantom{c}}</code>	$\models$	<code>\models</code>	$\approx$	<code>\succcurlyeq</code>
$\curlyeqprec$	<code>\curlyeqprec</code>	$\circ$	<code>\multimap</code>	$\succ$	<code>\succeq</code>
$\curlyeqsucc$	<code>\curlyeqsucc</code>	$\circ$	<code>\multimapinv</code>	$\approx$	<code>\succeqq</code>
$\dashcolon$	<code>\dashcolon</code>	$\ni$	<code>\ni</code>	$\approx$	<code>\succnapprox</code>
$\dashv$	<code>\dashv</code>	$\ni\bar{\phantom{a}}$	<code>\niobar</code>	$\approx$	<code>\succneq</code>
$\dashV$	<code>\dashV</code>	$\ni$	<code>\nis</code>	$\approx$	<code>\succneqq</code>
$\Dashv$	<code>\Dashv</code>	$\ni$	<code>\nisd</code>	$\approx$	<code>\succnsim</code>
$\DashV$	<code>\DashV</code>	$\neg$	<code>\Not</code>	$\approx$	<code>\succsim</code>
$\DashVDash$	<code>\DashVDash</code>	$/$	<code>\notchar</code>	$\approx$	<code>\thickapprox</code>
$\dashVdash$	<code>\dashVdash</code>	$\circ$	<code>\origof</code>	$\sim$	<code>\thicksim</code>
$\ddot{\approx}$	<code>\ddot{\approx}</code>	$\parallel$	<code>\parallel</code>	$\ni$	<code>\topfork</code>
$\disin$	<code>\disin</code>	$\#$	<code>\parsim</code>	$\rightarrow$	<code>\upfishtail</code>
$\Doteq$	<code>\Doteq</code>	$\perp$	<code>\perp</code>	$\in$	<code>\upin</code>
$\doteq$	<code>\doteq</code>	$\ni$	<code>\pitchfork</code>	$\in$	<code>\varisinobar</code>
$\dotequiv$	<code>\dotequiv</code>	$\prec$	<code>\prec</code>	$\in$	<code>\varisins</code>

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$\sim$	<code>\dotsim</code>	$\preccurlyeq$	<code>\Prec</code>	$\overline{\cup}$	<code>\varniobar</code>
$\dotscdots$	<code>\dotsminusdots</code>	$\approx$	<code>\precapprox</code>	$\varnothing$	<code>\varnis</code>
$\downarrow$	<code>\downfishtail</code>	$\preccurlyeq$	<code>\preccurlyeq</code>	$\propto$	<code>\varpropto</code>
$\circlearrowleft$	<code>\dualmap</code>	$\preceq$	<code>\preceq</code>	$\dashv$	<code>\varVdash</code>
$\#$	<code>\eparsl</code>	$\preceq$	<code>\preceq</code>	$\vbar$	<code>\vBar</code>
$\#$	<code>\eqcirc</code>	$\preccurlyeq$	<code>\preccurlyeq</code>	$\Vbar$	<code>\Vbar</code>
$\equiv$	<code>\eqcolon</code>	$\precneq$	<code>\precneq</code>	$\bar{+}$	<code>\vBarv</code>
$\equiv$	<code>\eqdef</code>	$\precneq$	<code>\precneq</code>	$\dashv$	<code>\Vdash</code>
$\cdot$	<code>\eqdot</code>	$\precnsim$	<code>\precnsim</code>	$\dashv$	<code>\vdash</code>
$\equiv$	<code>\eqeq</code>	$\precsim$	<code>\precsim</code>	$\dashv$	<code>\vDash</code>
$\equiv$	<code>\eqeqeq</code>	$\propto$	<code>\propto</code>	$\dashv$	<code>\VDash</code>
$\approx$	<code>\eqqsim</code>	$\simeq$	<code>\prurel</code>	$\dashv$	<code>\vDdash</code>
$\approx$	<code>\eqsim</code>	$\lrcorner$	<code>\pullback</code>	$\vdots$	<code>\vdots</code>
$\#$	<code>\equalparallel</code>	$\sqsupset$	<code>\pushout</code>	$\leq$	<code>\veeeq</code>
$\equiv$	<code>\equiv</code>	$\dashv$	<code>\questeq</code>	$\wedge$	<code>\veeonwedge</code>
$\equiv$	<code>\Equiv</code>	$\dagger$	<code>\revnmid</code>	$ $	<code>\vertoverlay</code>
$\equiv$	<code>\equivDD</code>	$\bowtie$	<code>\rftimes</code>	$\longdashv$	<code>\vlongdash</code>
$\#$	<code>\equivVert</code>	$\times$	<code>\rftimes</code>	$\dashv$	<code>\Vvdash</code>
$\#$	<code>\equivVvert</code>	$\succ$	<code>\rightdbltail</code>	$\triangleq$	<code>\wedseq</code>

stix defines `\owns` as a synonym for `\ni` and `\doteqdot` as a synonym for `\Doteq`.

TABLE 114: stix Negated Binary Relations

$\nexists$	<code>\forks</code>	$\nparallel$	<code>\npar</code>	$\nsimeq$	<code>\nsime</code>
$\approx$	<code>\napprox</code>	$\nmid$	<code>\nmid</code>	$\nsucc$	<code>\nsucc</code>
$\approx$	<code>\napproxeqq</code>	$\nsubseteq$	<code>\nni</code>	$\nsucccurlyeq$	<code>\nsucccurlyeq</code>
$\asymp$	<code>\nasymp</code>	$\notin$	<code>\notin</code>	$\nsucceq$	<code>\nsucceq</code>
$\nbumpeq$	<code>\nBumpeq</code>	$\nparallel$	<code>\nparallel</code>	$\nvarisinobar$	<code>\nvarisinobar</code>
$\nbumpeq$	<code>\nbumpeq</code>	$\nprec$	<code>\nprec</code>	$\nvarniobar$	<code>\nvarniobar</code>
$\ncong$	<code>\ncong</code>	$\npreccurlyeq$	<code>\npreccurlyeq</code>	$\nvDash$	<code>\nvDash</code>
$\ncongdot$	<code>\ncongdot</code>	$\npreceq$	<code>\npreceq</code>	$\nvDash$	<code>\nvDash</code>
$\neq$	<code>\neq</code>	$\nshortmid$	<code>\nshortmid</code>	$\nVDash$	<code>\nVDash</code>
$\neqsim$	<code>\neqsim</code>	$\nshortparallel$	<code>\nshortparallel</code>	$\nVdash$	<code>\nVdash</code>
$\nequiv$	<code>\nequiv</code>	$\nsim$	<code>\nsim</code>		

stix defines `\neq` as a synonym for `\neq`, `\nsimeq` as a synonym for `\nsime`, and `\nforksnot` as a synonym for `\forks`.



TABLE 115: mathtools Binary Relations

$::\approx$	<code>\Colonapprox</code>	$:-$	<code>\coloneq</code>	$-::$	<code>\Eqcolon</code>
$\approx$	<code>\colonapprox</code>	$\sim$	<code>\colonsim</code>	$=:$	<code>\eqqcolon</code>
$:=$	<code>\coloneqq</code>	$::\sim$	<code>\Colonsim</code>	$==:$	<code>\Eqqqcolon</code>
$::=$	<code>\Coloneqq</code>	$::$	<code>\dblcolon</code>		
$::-$	<code>\Coloneq</code>	$-:$	<code>\eqcolon</code>		

Similar symbols can be defined using mathtools’s `\vcentcolon`, which produces a colon centered on the font’s math axis:

$$\begin{array}{ccc} \frac{def}{abc} \text{ : } \frac{def}{abc} & \text{vs.} & \frac{def}{abc} \text{ : } \frac{def}{abc} \\ \text{“=:=”} & & \text{“=\vcentcolon=”} \end{array}$$

TABLE 116: turnstile Binary Relations

$\frac{def}{abc}$	<code>\dddtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\nntstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\stdtstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\ddststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\nnttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\stststile{abc}{def}</code>
$\frac{def}{abc}$	<code>\ddtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\nsdtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sttstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\ddttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\nsststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\stttstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dndtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\nststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tddtstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dnststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\nsttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tdststile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dntstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\ntdtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tdtstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dnttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\ntststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tdttstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dsdtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\nttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tndtstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dsststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\ntttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tnststile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sddtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tntstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dsttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sdststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tnttstile{abc}{def}</code>

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$\frac{def}{abc}$	<code>\dtdtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sdtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tsdtstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dtststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sdtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tsststile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sntstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tststile{abc}{def}</code>
$\frac{def}{abc}$	<code>\dtttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sntstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tsttstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\nddtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sntstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tttstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\ndststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\snttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tttstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\ndtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\ssdtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\tttstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\ndttstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\ssststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\ttttstile{abc}{def}</code>
$\frac{def}{abc}$	<code>\nndtstile{abc}{def}</code>	$\frac{def}{abc}$	<code>\sststile{abc}{def}</code>		
$\frac{def}{abc}$	<code>\nnststile{abc}{def}</code>	$\frac{def}{abc}$	<code>\ssttstile{abc}{def}</code>		

Each of the above takes an optional argument that controls the size of the upper and lower expressions. See the turnstile documentation for more information.

TABLE 117: trsym Binary Relations

$\bullet \circ$	<code>\InversTransformHoriz</code>	$\circ \bullet$	<code>\TransformHoriz</code>
$\bullet \circ$	<code>\InversTransformVert</code>	$\circ \bullet$	<code>\TransformVert</code>

TABLE 118: trfsigns Binary Relations

$\circ \diagup$	<code>\dfourier</code>	$\diagdown \circ$	<code>\Dfourier</code>
$\circ \text{---}$	<code>\fourier</code>	$\text{---} \circ$	<code>\Fourier</code>
$\circ \text{---} \bullet$	<code>\laplace</code>	$\bullet \text{---} \circ$	<code>\Laplace</code>
$\circ \diagup \bullet$	<code>\ztransf</code>	$\bullet \diagdown \circ$	<code>\Ztransf</code>

TABLE 119: pdfMsym Binary Relations

$\Leftarrow$	<code>\leftPP</code>	$\Leftrightarrow$	<code>\longgroundedarrow</code>	$\curvearrowright$	<code>\roundedarrow</code>
$\Leftrightarrow$	<code>\longleftPP</code>	$\Leftrightarrow$	<code>\longsquaredarrow</code>	$\squareleftarrow$	<code>\squaredarrow</code>
$\Rrightarrow$	<code>\longrightPP</code>	$\Rrightarrow$	<code>\rightPP</code>		

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>q</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

TABLE 120: cml Binary Relations

$\circ$	<code>\coh</code>	$\frown$	<code>\scoh</code>
$\times$	<code>\incoh</code>	$\smile$	<code>\sincoh</code>
$\perp$	<code>\Perp</code>	$\pitchfork$	<code>\simperp</code>
$\circ\circ$	<code>\multimapboth</code>		

TABLE 121: colonequals Binary Relations

$\approx$	<code>\approxcolon</code>	$\colon\!-\!$	<code>\coloncolonminus</code>	$\equiv$	<code>\equalscoloncolon</code>
$\approx\!:\!$	<code>\approxcoloncolon</code>	$\colon\!\sim\!$	<code>\coloncolonsim</code>	$\!-\!$	<code>\minuscolon</code>
$\:\approx$	<code>\colonapprox</code>	$\!:=$	<code>\colonequals</code>	$\!-\!:\!$	<code>\minuscoloncolon</code>
$\!:\!$	<code>\coloncolon</code>	$\!-\!$	<code>\colonminus</code>	$\!:\!$	<code>\ratio</code>
$\!:\!\approx$	<code>\coloncolonapprox</code>	$\!:\!\sim$	<code>\colonsim</code>	$\!\sim\!$	<code>\simcolon</code>
$\!:=$	<code>\coloncolonequals</code>	$\!:=$	<code>\equalscolon</code>	$\!\sim\!:\!$	<code>\simcoloncolon</code>

TABLE 122: fourier Binary Relations

$\#$	<code>\nparallelslant</code>	$\parallel$	<code>\parallelslant</code>
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TABLE 123: logix Binary Relations

$\equiv$	<code>\ClsEquiv</code>	$\not\equiv$	<code>\NotClsEquiv</code>	$\nrightarrow$	<code>\NotPre</code>	$\prec$	<code>\Pre</code>
$\supset$	<code>\ClsImpl</code>	$\not\supset$	<code>\NotClsImpl</code>	$\nrightarrow$	<code>\NotPreq</code>	$\preceq$	<code>\Preq</code>
$\models$	<code>\Conseq</code>	$\not\models$	<code>\NotConseq</code>	$\nrightarrow$	<code>\NotRule</code>	$\vdash$	<code>\Rule</code>
$\models$	<code>\DTrpTurn</code>	$\not\models$	<code>\NotDTrpTurn</code>	$\nrightarrow$	<code>\NotSeq</code>	$\succ$	<code>\Seq</code>
$\models$	<code>\DTurnDWavy</code>	$\not\models$	<code>\NotDTurnDWavy</code>	$\nrightarrow$	<code>\NotSuc</code>	$\succ$	<code>\Suc</code>
$\models$	<code>\DTurnWavy</code>	$\not\models$	<code>\NotDTurnWavy</code>	$\nrightarrow$	<code>\NotSucq</code>	$\succeq$	<code>\Sucq</code>
$\models$	<code>\Model</code>	$\not\models$	<code>\NotModel</code>	$\nrightarrow$	<code>\NotTrpTurn</code>	$\models$	<code>\TrpTurn</code>
$\multimap$	<code>\MulMap</code>	$\not\multimap$	<code>\NotMulMap</code>	$\nrightarrow$	<code>\NotTurn</code>	$\models$	<code>\Turn</code>
$\multimap$	<code>\MulMapDual</code>	$\not\multimap$	<code>\NotMulMapDual</code>	$\nrightarrow$	<code>\NotTurnDWavy</code>	$\models$	<code>\TurnDWavy</code>
$\multimap$	<code>\MulMapInv</code>	$\not\multimap$	<code>\NotMulMapInv</code>	$\nrightarrow$	<code>\NotTurnWavy</code>	$\models$	<code>\TurnWavy</code>

logix requires either LuaL<sup>A</sup>T<sub>E</sub>X or X<sub>q</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 124: logix Set Symbols

$\in$	<code>\In</code>	$\notin$	<code>\NotOwns</code>	$:$	<code>\Of</code>	$\emptyset$	<code>\VoidBunch</code>
$\notin$	<code>\NotIn</code>	$\emptyset$	<code>\NullSet</code>	$\ni$	<code>\Owns</code>		

logix requires either Lua $\LaTeX$  or Xe $\LaTeX$ .

TABLE 125: Subset and Superset Relations

$\sqsubset$	<code>\sqsubset*</code>	$\sqsupseteq$	<code>\sqsupseteq</code>	$\supset$	<code>\supset</code>
$\sqsubseteq$	<code>\sqsubseteq</code>	$\subset$	<code>\subset</code>	$\supseteq$	<code>\supseteq</code>
	<code>\sqsubset*</code>	$\subseteq$	<code>\subseteq</code>		

\* Not predefined by the  $\LaTeX 2_{\epsilon}$  core. Use the `latexsym` package to expose this symbol.

TABLE 126:  $\mathcal{A}\mathcal{M}\mathcal{S}$  Subset and Superset Relations

$\not\subseteq$	<code>\nsubseteq</code>	$\subseteq$	<code>\subseteq</code>	$\supsetneqq$	<code>\supsetneqq</code>
$\not\supseteq$	<code>\nsupseteq</code>	$\subsetneq$	<code>\subsetneq</code>	$\varsubsetneq$	<code>\varsubsetneq</code>
$\not\supseteqq$	<code>\nsupseteqq</code>	$\subsetneqq$	<code>\subsetneqq</code>	$\varsubsetneqq$	<code>\varsubsetneqq</code>
$\sqsubset$	<code>\sqsubset</code>	$\supset$	<code>\Supset</code>	$\varsupsetneq$	<code>\varsupsetneq</code>
	<code>\sqsubset</code>	$\supseteqq$	<code>\supseteqq</code>	$\varsupsetneqq$	<code>\varsupsetneqq</code>
$\Subset$	<code>\Subset</code>	$\supsetneq$	<code>\supsetneq</code>		

TABLE 127: stmaryrd Subset and Superset Relations

$\Subset$	<code>\subsetplus</code>	$\supsetplus$	<code>\supsetplus</code>
$\subseteq$	<code>\subsetpluseq</code>	$\supsetpluseq$	<code>\supsetpluseq</code>

TABLE 128: wasysym Subset and Superset Relations

$\sqsubset$	<code>\sqsubset</code>	$\sqsupset$	<code>\sqsupset</code>
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TABLE 129: txfonts/pxfonts Subset and Superset Relations

$\not\subseteq$	<code>\nqsubset</code>	$\not\supseteq$	<code>\nqsupseteq</code>	$\not\supset$	<code>\nSupset</code>
$\not\subseteq$	<code>\nqsubseteq</code>	$\notin$	<code>\nSubset</code>		
	<code>\nqsubset</code>	$\not\supseteqq$	<code>\nsubseteqq</code>		

TABLE 130: mathabx Subset and Superset Relations

$\subsetneq$	<code>\nsqsubset</code>	$\supset$	<code>\nsupset</code>	$\supseteq$	<code>\sqsupseteq</code>	$\supseteq$	<code>\supseteq</code>
$\Subset$	<code>\nsqSubset</code>	$\supsetneq$	<code>\nSupset</code>	$\supsetneqq$	<code>\sqsupseteqq</code>	$\supseteqq$	<code>\supseteqq</code>
$\subsetneq$	<code>\nsqsubseteq</code>	$\supseteq$	<code>\nsupseteq</code>	$\supsetneq$	<code>\sqsupsetneq</code>	$\supsetneq$	<code>\supsetneq</code>
$\subseteq$	<code>\nsqsubseteqq</code>	$\supseteqq$	<code>\nsupseteqq</code>	$\supsetneqq$	<code>\sqsupsetneqq</code>	$\supsetneqq$	<code>\supsetneqq</code>
$\supset$	<code>\nsqsupset</code>	$\subset$	<code>\sqsubset</code>	$\subset$	<code>\subset</code>	$\varsubsetneq$	<code>\varsqsubsetneq</code>
$\supsetneq$	<code>\nsqSupset</code>	$\subseteq$	<code>\sqSubset</code>	$\subseteq$	<code>\Subset</code>	$\varsubsetneqq$	<code>\varsqsubsetneqq</code>
$\supseteq$	<code>\nsqsupseteq</code>	$\subseteq$	<code>\sqsubseteq</code>	$\subseteq$	<code>\subseteq</code>	$\varsubsetneq$	<code>\varsqsupsetneq</code>
$\supseteqq$	<code>\nsqsupseteqq</code>	$\subseteqq$	<code>\sqsubseteqq</code>	$\subseteqq$	<code>\subseteqq</code>	$\varsubsetneqq$	<code>\varsqsupsetneqq</code>
$\subset$	<code>\nsubset</code>	$\varsubsetneq$	<code>\sqsubsetneq</code>	$\subsetneq$	<code>\subsetneq</code>	$\varsubsetneq$	<code>\varsubsetneq</code>
$\Subset$	<code>\nSubset</code>	$\varsubsetneqq$	<code>\sqsubsetneqq</code>	$\subsetneqq$	<code>\subsetneqq</code>	$\varsubsetneqq$	<code>\varsubsetneqq</code>
$\subseteq$	<code>\nsubseteq</code>	$\supset$	<code>\sqSupset</code>	$\supset$	<code>\supset</code>	$\varsupsetneq$	<code>\varsupsetneq</code>
$\subseteqq$	<code>\nsubseteqq</code>	$\supseteq$	<code>\sqSupseteq</code>	$\supseteq$	<code>\Supset</code>	$\varsupsetneqq$	<code>\varsupsetneqq</code>

TABLE 131: MnSymbol Subset and Superset Relations

$\sqsubset$	<code>\nSqsubset</code>	$\subsetneq$	<code>\nsubseteq</code>	$\varsubsetneq$	<code>\sqsubsetneq</code>	$\subseteq$	<code>\subseteq</code>
$\subsetneq$	<code>\nsqsubset</code>	$\varsubsetneq$	<code>\nsubseteqq</code>	$\varsubsetneqq$	<code>\sqsubsetneqq</code>	$\subseteqq$	<code>\subseteqq</code>
$\subseteq$	<code>\nsqsubseteq</code>	$\supset$	<code>\nSupset</code>	$\supset$	<code>\Sqsupset</code>	$\varsubsetneq$	<code>\subseteq</code>
$\subseteqq$	<code>\nsqsubseteqq</code>	$\supsetneq$	<code>\nSupseteq</code>	$\supsetneq$	<code>\sqsupset</code>	$\varsubsetneqq$	<code>\subseteq</code>
$\supset$	<code>\nSqsupset</code>	$\supseteq$	<code>\nSupseteq</code>	$\supseteq$	<code>\sqsupseteq</code>	$\supset$	<code>\Supset</code>
$\supsetneq$	<code>\nsqsupseteq</code>	$\supseteqq$	<code>\nSupseteqq</code>	$\supseteqq$	<code>\sqsupseteqq</code>	$\supset$	<code>\supset</code>
$\supseteq$	<code>\nsqsupseteq</code>	$\subseteq$	<code>\Sqsubset</code>	$\varsubsetneq$	<code>\sqsupsetneq</code>	$\supseteq$	<code>\supseteq</code>
$\supseteqq$	<code>\nsqsupseteqq</code>	$\subseteqq$	<code>\Sqsubseteq</code>	$\varsubsetneqq$	<code>\sqsupsetneqq</code>	$\supseteqq$	<code>\supseteqq</code>
$\Subset$	<code>\nSubset</code>	$\subseteq$	<code>\sqsubseteq</code>	$\subseteq$	<code>\Subset</code>	$\varsubsetneq$	<code>\supsetneq</code>
$\subset$	<code>\nsubset</code>	$\subseteqq$	<code>\sqsubseteqq</code>	$\subset$	<code>\subset</code>	$\varsubsetneqq$	<code>\supsetneqq</code>

MnSymbol additionally defines `\varsubsetneq` as a synonym for `\subsetneq`, `\varsubsetneqq` as a synonym for `\subsetneqq`, `\varsupsetneq` as a synonym for `\supsetneq`, and `\varsupsetneqq` as a synonym for `\supsetneqq`.

TABLE 132: fdsymbol Subset and Superset Relations

$\not\subset$	<code>\nqssubset</code>	$\not\subseteq$	<code>\nsubseteq</code>	$\not\supseteq$	<code>\sqsubsetneq</code>	$\subseteq$	<code>\subseteq</code>
$\not\supseteq$	<code>\nSqssubset</code>	$\not\supseteqq$	<code>\nsubseteqq</code>	$\not\supseteqq$	<code>\sqsubsetneqq</code>	$\subseteqq$	<code>\subseteqq</code>
$\not\supseteq$	<code>\nqssubseteq</code>	$\not\supset$	<code>\nsupset</code>	$\not\supset$	<code>\sqsupset</code>	$\supseteq$	<code>\supseteq</code>
$\not\supseteqq$	<code>\nqssubseteqq</code>	$\not\supset$	<code>\nSupset</code>	$\not\supset$	<code>\Sqsupset</code>	$\supseteq$	<code>\supseteqq</code>
$\not\supset$	<code>\nqssubset</code>	$\not\supseteq$	<code>\nsupseteq</code>	$\not\supseteq$	<code>\sqsupseteq</code>	$\supset$	<code>\supset</code>
$\not\supset$	<code>\nSqssubset</code>	$\not\supseteqq$	<code>\nsupseteqq</code>	$\not\supseteqq$	<code>\sqsupseteqq</code>	$\supseteq$	<code>\Supset</code>
$\not\supseteq$	<code>\nqssubseteq</code>	$\not\supseteq$	<code>\sqsubset</code>	$\not\supseteq$	<code>\sqsupsetneq</code>	$\supseteq$	<code>\supseteq</code>
$\not\supseteqq$	<code>\nqssubseteqq</code>	$\not\supseteq$	<code>\Sqsubset</code>	$\not\supseteqq$	<code>\sqsupsetneqq</code>	$\supseteqq$	<code>\supseteqq</code>
$\subset$	<code>\nsubset</code>	$\subseteq$	<code>\sqsubseteq</code>	$\subset$	<code>\subset</code>	$\supseteq$	<code>\supseteq</code>
$\subset$	<code>\nSubset</code>	$\subseteqq$	<code>\sqsubseteqq</code>	$\subset$	<code>\Subset</code>	$\supseteqq$	<code>\supseteqq</code>

fdsymbol additionally defines `\varsubsetneqq` as a synonym for `\subsetneqq`, `\varsubsetneq` as a synonym for `\subsetneq`, `\varsupsetneqq` as a synonym for `\supsetneqq`, and `\varsupsetneq` as a synonym for `\supsetneq`.

TABLE 133: boisk Subset and Superset Relations

$\subset$	<code>\nsubset</code>	$\subseteq$	<code>\sqSubset</code>	$\subseteq$	<code>\subsetplus</code>	$\supseteq$	<code>\supsetplusseq</code>
$\subseteq$	<code>\nsubseteq</code>	$\supseteq$	<code>\sqSupset</code>	$\subseteq$	<code>\subsetpluseq</code>	$\not\subseteq$	<code>\varsubsetneq</code>
$\subseteqq$	<code>\nsubseteqq</code>	$\supseteqq$	<code>\sqsupset</code>	$\supseteq$	<code>\Supset</code>	$\not\subseteqq$	<code>\varsubsetneqq</code>
$\supset$	<code>\nsupset</code>	$\subseteq$	<code>\Subset</code>	$\supseteqq$	<code>\supseteqq</code>	$\not\supseteq$	<code>\varsupsetneq</code>
$\supseteq$	<code>\nsupseteq</code>	$\subseteqq$	<code>\subseteqq</code>	$\supseteq$	<code>\supsetneq</code>	$\not\supseteq$	<code>\varsupsetneqq</code>
$\supseteqq$	<code>\nsupseteqq</code>	$\not\subseteq$	<code>\subsetneq</code>	$\not\supseteq$	<code>\supsetneqq</code>		
$\supseteqq$	<code>\nqssubset</code>	$\not\subseteqq$	<code>\subsetneqq</code>	$\supseteq$	<code>\supsetplus</code>		

TABLE 134: stix Subset and Superset Relations

$\subset$	<code>\bsolhsub</code>	$\supseteq$	<code>\sqsupseteq</code>	$\supsetsubset$	<code>\suphsub</code>
$\subset$	<code>\csub</code>	$\not\supseteq$	<code>\sqsupsetneq</code>	$\supsetlarr$	<code>\suplarr</code>
$\subset$	<code>\csube</code>	$\subseteq$	<code>\subedot</code>	$\supmult$	<code>\supmult</code>
$\subset$	<code>\csup</code>	$\not\subseteq$	<code>\submult</code>	$\supset$	<code>\Supset</code>
$\subset$	<code>\csupe</code>	$\supset$	<code>\subrarr</code>	$\supset$	<code>\supset</code>
$\leftarrow$	<code>\leftarrowsubset</code>	$\subseteq$	<code>\Subset</code>	$\supsetapprox$	<code>\supsetapprox</code>
$\not\subset$	<code>\nqssubset</code>	$\subset$	<code>\subset</code>	$\supsetcirc^*$	<code>\supsetcirc^*</code>
$\not\subseteq$	<code>\nqssubseteq</code>	$\supsetapprox$	<code>\subsetapprox</code>	$\supsetdot$	<code>\supsetdot</code>
$\not\supset$	<code>\nqssubset</code>	$\supsetcirc^*$	<code>\subsetcirc^*</code>	$\supseteq$	<code>\supseteq</code>
$\not\supseteq$	<code>\nqssubseteq</code>	$\subseteq$	<code>\subsetdot</code>	$\supseteqq$	<code>\supseteqq</code>
$\subset$	<code>\nsubset</code>	$\subseteq$	<code>\subseteq</code>	$\supsetneq$	<code>\supsetneq</code>

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$\not\subset$	<code>\nsubseteq</code>	$\subseteq$	<code>\subseteqeq</code>	$\supsetneq$	<code>\supsetneqq</code>
$\not\subseteq$	<code>\nsubseteqeq</code>	$\subsetneq$	<code>\subsetneq</code>	$\supsetplus$	<code>\supsetplus</code>
$\not\supset$	<code>\nsupset</code>	$\not\subseteq$	<code>\notsubseteq</code>	$\supsim$	<code>\supsim</code>
$\not\supseteq$	<code>\nsupseteq</code>	$\subsetplus$	<code>\subsetplus</code>	$\supsub$	<code>\supsub</code>
$\not\supseteqq$	<code>\nsupseteqq</code>	$\subset\sim$	<code>\subset\sim</code>	$\supsup$	<code>\supsup</code>
$\Rightarrow$	<code>\rightarrowset</code>	$\subset\subset$	<code>\subset\subset</code>	$\varsubsetneq$	<code>\varsubsetneq</code>
$\sqsubset$	<code>\sqsubset</code>	$\subset\sup$	<code>\subset\sup</code>	$\varsubsetneqq$	<code>\varsubsetneqq</code>
$\sqsubseteq$	<code>\sqsubseteqeq</code>	$\sup\subset$	<code>\sup\subset</code>	$\varsupsetneq$	<code>\varsupsetneq</code>
$\sqsupset$	<code>\sqsupseteq</code>	$\sup\sup$	<code>\sup\sup</code>	$\varsupsetneqq$	<code>\varsupsetneqq</code>
$\sqsupseteq$	<code>\sqsupseteqq</code>	$\sup\dot{\subset}$	<code>\sup\dot{\subset}</code>		
$\sqsupseteqq$	<code>\sqsupseteqq</code>	$\sup\dot{\supset}$	<code>\sup\dot{\supset}</code>		
$\supset$	<code>\supset</code>	$\sup\dot{\supset}$	<code>\sup\dot{\supset}</code>		

\* Defined as an ordinary character, not as a binary relation.

TABLE 135: logix Subset and Superset Relations

$\Subset$	<code>\FntSbset</code>	$\not\Subset$	<code>\NotStrctFntSbset</code>	$\not\supset$	<code>\NotWkSbnch</code>	$\sqsubset$	<code>\StrctSbmap</code>
$\not\Subset$	<code>\NotFntSbset</code>	$\not\supset$	<code>\NotStrctSbmap</code>	$\sqsubset$	<code>\Sbmap</code>	$\sqsubset$	<code>\StrctSbnch</code>
$\not\supset$	<code>\NotSbmap</code>	$\not\supset$	<code>\NotStrctSbnch</code>	$\sqsubset$	<code>\Sbnch</code>	$\subset$	<code>\StrctSbset</code>
$\not\supset$	<code>\NotSbnch</code>	$\not\supset$	<code>\NotStrctSbset</code>	$\subset$	<code>\Sbset</code>	$\sqsupset$	<code>\StrctWkSbnch</code>
$\not\supset$	<code>\NotSbset</code>	$\not\supset$	<code>\NotStrctWkSbnch</code>	$\sqsupset$	<code>\StrctFntSbset</code>	$\sqsupset$	<code>\WkSbnch</code>

logix requires either Lua $\LaTeX$  or X $\LaTeX$ .

TABLE 136: Inequalities

$\geq$	<code>\geq</code>	$\gg$	<code>\gg</code>	$\leq$	<code>\leq</code>	$\ll$	<code>\ll</code>	$\neq$	<code>\neq</code>
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TABLE 137:  $\mathcal{AMS}$  Inequalities

$\gtrsim$	<code>\eqslantgtr</code>	$\gtrdot$	<code>\gtrdot</code>	$\lesseqgtr$	<code>\lesseqgtr</code>	$\ngeq$	<code>\ngeq</code>
$\lesseqgtr$	<code>\lesseqgtr</code>	$\gtreqless$	<code>\gtreqless</code>	$\lesseqqgtr$	<code>\lesseqqgtr</code>	$\ngeqq$	<code>\ngeqq</code>
$\geqq$	<code>\geqq</code>	$\gtreqqless$	<code>\gtreqqless</code>	$\lessgtr$	<code>\lessgtr</code>	$\ngeqslant$	<code>\ngeqslant</code>
$\geqslant$	<code>\geqslant</code>	$\gtrless$	<code>\gtrless</code>	$\lesssim$	<code>\lesssim</code>	$\ngtr$	<code>\ngtr</code>
$\ggg$	<code>\ggg</code>	$\gtrsim$	<code>\gtrsim</code>	$\lll$	<code>\lll</code>	$\nleq$	<code>\nleq</code>
$\gapprox$	<code>\gapprox</code>	$\gvertneqq$	<code>\gvertneqq</code>	$\lnapprox$	<code>\lnapprox</code>	$\nleqq$	<code>\nleqq</code>
$\gneq$	<code>\gneq</code>	$\leqq$	<code>\leqq</code>	$\lneq$	<code>\lneq</code>	$\nleqslant$	<code>\nleqslant</code>
$\gneqq$	<code>\gneqq</code>	$\leqslant$	<code>\leqslant</code>	$\lneqq$	<code>\lneqq</code>	$\nless$	<code>\nless</code>
$\gnsim$	<code>\gnsim</code>	$\lessapprox$	<code>\lessapprox</code>	$\lnsim$	<code>\lnsim</code>		
$\gtrapprox$	<code>\gtrapprox</code>	$\lessdot$	<code>\lessdot</code>	$\lvertneqq$	<code>\lvertneqq</code>		

TABLE 138: wasysym Inequalities

$$\gtrsim \backslash\text{apprge} \quad \lesssim \backslash\text{apprle}$$

TABLE 139: txfonts/pxfonts Inequalities

$\nlessgtr$ <code>\ngg</code>	$\nlessgtr$ <code>\ngtrsim</code>	$\nlessgtr$ <code>\nlessim</code>
$\nlessgtr$ <code>\ngtrapprox</code>	$\nlessgtr$ <code>\nlessapprox</code>	$\nlessgtr$ <code>\nll</code>
$\nlessgtr$ <code>\ngtrless</code>	$\nlessgtr$ <code>\nlessgtr</code>	

TABLE 140: mathabx Inequalities

$\gtrsim$ <code>\eqslantgtr</code>	$\gtrsim$ <code>\gtreqless</code>	$\lesssim$ <code>\lesssim</code>	$\nlessgtr$ <code>\ngtr</code>
$\lessgtr$ <code>\eqslantless</code>	$\lessgtr$ <code>\gtreqqless</code>	$\lessgtr$ <code>\ll</code>	$\nlessgtr$ <code>\ngtrapprox</code>
$\gtrsim$ <code>\geq</code>	$\gtrsim$ <code>\gtrless</code>	$\lessgtr$ <code>\lll</code>	$\nlessgtr$ <code>\ngtrsim</code>
$\gtrsim$ <code>\geqq</code>	$\gtrsim$ <code>\gtrsim</code>	$\lessgtr$ <code>\lnapprox</code>	$\nlessgtr$ <code>\nleq</code>
$\gg$ <code>\gg</code>	$\nlessgtr$ <code>\gvertneqq</code>	$\lessgtr$ <code>\lneq</code>	$\nlessgtr$ <code>\nleqq</code>
$\ggg$ <code>\ggg</code>	$\lessgtr$ <code>\leq</code>	$\nlessgtr$ <code>\lneqq</code>	$\nlessgtr$ <code>\nless</code>
$\nlessgtr$ <code>\gnapprox</code>	$\lessgtr$ <code>\leqq</code>	$\lessgtr$ <code>\lnsim</code>	$\nlessgtr$ <code>\nlessapprox</code>
$\nlessgtr$ <code>\gneq</code>	$\nlessgtr$ <code>\lessapprox</code>	$\nlessgtr$ <code>\lvertneqq</code>	$\nlessgtr$ <code>\nlesssim</code>
$\nlessgtr$ <code>\gneqq</code>	$\lessgtr$ <code>\lessdot</code>	$\nlessgtr$ <code>\neqslantgtr</code>	$\nlessgtr$ <code>\nvargeq</code>
$\nlessgtr$ <code>\gnsim</code>	$\lessgtr$ <code>\lesseqgtr</code>	$\nlessgtr$ <code>\neqslantless</code>	$\nlessgtr$ <code>\nvarleq</code>
$\nlessgtr$ <code>\gtrapprox</code>	$\lessgtr$ <code>\lesseqqgtr</code>	$\nlessgtr$ <code>\ngeq</code>	$\gtrsim$ <code>\vargeq</code>
$\nlessgtr$ <code>\gtrdot</code>	$\lessgtr$ <code>\lessgtr</code>	$\nlessgtr$ <code>\ngeqq</code>	$\lessgtr$ <code>\varleq</code>

`mathabx` defines `\leqslant` and `\le` as synonyms for `\leq`, `\geqslant` and `\ge` as synonyms for `\geq`, `\nleqslant` as a synonym for `\nleq`, and `\ngeqslant` as a synonym for `\ngeq`.



TABLE 141: MnSymbol Inequalities

$\succ$	<code>\eqslantgtr</code>	$\gtrsim$	<code>\gtreqqlless</code>	$\lesssim$	<code>\lessim</code>	$\ngtrless$	<code>\ngtreqless</code>
$\prec$	<code>\eqslantless</code>	$\gtrless$	<code>\gtrless</code>	$\ll$	<code>\ll</code>	$\ngtreqlessslant$	<code>\ngtreqlessslant</code>
$\geq$	<code>\geq</code>	$\gtrneqqless$	<code>\gtrneqqless</code>	$\lll$	<code>\lll</code>	$\ngtreqqlless$	<code>\ngtreqqlless</code>
$\triangleright$	<code>\geqclosed</code>	$\gtrsim$	<code>\gtrsim</code>	$\lnapprox$	<code>\lnapprox</code>	$\ngtrless$	<code>\ngtrless</code>
$\geqdot$	<code>\geqdot</code>	$\leq$	<code>\leq</code>	$\lneqq$	<code>\lneqq</code>	$\nleq$	<code>\nleq</code>
$\geqq$	<code>\geqq</code>	$\triangleleft$	<code>\leqclosed</code>	$\lnsim$	<code>\lnsim</code>	$\nleqclosed$	<code>\nleqclosed</code>
$\geqslant$	<code>\geqslant</code>	$\leqdot$	<code>\leqdot</code>	$\neqslantgtr$	<code>\neqslantgtr</code>	$\nleqdot$	<code>\nleqdot</code>
$\geqslantdot$	<code>\geqslantdot</code>	$\leqq$	<code>\leqq</code>	$\neqslantless$	<code>\neqslantless</code>	$\nleqq$	<code>\nleqq</code>
$\gg$	<code>\gg</code>	$\leqslant$	<code>\leqslant</code>	$\ngeq$	<code>\ngeq</code>	$\nleqslant$	<code>\nleqslant</code>
$\ggg$	<code>\ggg</code>	$\leqslantdot$	<code>\leqslantdot</code>	$\ngeqclosed$	<code>\ngeqclosed</code>	$\nleqslantdot$	<code>\nleqslantdot</code>
$\gapprox$	<code>\gapprox</code>	$\less$	<code>\less</code>	$\ngeqdot$	<code>\ngeqdot</code>	$\nless$	<code>\nless</code>
$\gneqq$	<code>\gneqq</code>	$\lessapprox$	<code>\lessapprox</code>	$\ngeqq$	<code>\ngeqq</code>	$\nlessclosed$	<code>\nlessclosed</code>
$\gnsim$	<code>\gnsim</code>	$\lessclosed$	<code>\lessclosed</code>	$\ngeqslant$	<code>\ngeqslant</code>	$\nlessdot$	<code>\nlessdot</code>
$\gtr$	<code>\gtr</code>	$\lessdot$	<code>\lessdot</code>	$\ngeqslantdot$	<code>\ngeqslantdot</code>	$\nlesseqgtr$	<code>\nlesseqgtr</code>
$\gtrapprox$	<code>\gtrapprox</code>	$\lesseqgtr$	<code>\lesseqgtr</code>	$\ngg$	<code>\ngg</code>	$\nlesseqgtrslant$	<code>\nlesseqgtrslant</code>
$\gtrclosed$	<code>\gtrclosed</code>	$\lesseqgtrslant$	<code>\lesseqgtrslant</code>	$\nggg$	<code>\nggg</code>	$\nlesseqgtr$	<code>\nlesseqgtr</code>
$\gtrdot$	<code>\gtrdot</code>	$\lesseqqgtr$	<code>\lesseqqgtr</code>	$\ngtr$	<code>\ngtr</code>	$\nlessgtr$	<code>\nlessgtr</code>
$\gtreqless$	<code>\gtreqless</code>	$\lessgtr$	<code>\lessgtr</code>	$\ngtrclosed$	<code>\ngtrclosed</code>	$\nll$	<code>\nll</code>
$\gtreqlessslant$	<code>\gtreqlessslant</code>	$\lessneqqgtr$	<code>\lessneqqgtr</code>	$\ngtrdot$	<code>\ngtrdot</code>	$\nlll$	<code>\nlll</code>

MnSymbol additionally defines synonyms for some of the preceding symbols:

$\gggtr$	<code>\gggtr</code>	(same as <code>\ggg</code> )
$\gvertneqq$	<code>\gvertneqq</code>	(same as <code>\gneqq</code> )
$\lhd$	<code>\lhd</code>	(same as <code>\lessclosed</code> )
$\lllless$	<code>\lllless</code>	(same as <code>\lll</code> )
$\lvertneqq$	<code>\lvertneqq</code>	(same as <code>\lneqq</code> )
$\ntrianglelefteq$	<code>\ntrianglelefteq</code>	(same as <code>\nleqclosed</code> )
$\ntriangleleft$	<code>\ntriangleleft</code>	(same as <code>\nlessclosed</code> )
$\ntrianglerighteq$	<code>\ntrianglerighteq</code>	(same as <code>\ngeqclosed</code> )
$\ntriangleright$	<code>\ntriangleright</code>	(same as <code>\ngtrclosed</code> )
$\rhd$	<code>\rhd</code>	(same as <code>\gtrclosed</code> )
$\trianglelefteq$	<code>\trianglelefteq</code>	(same as <code>\leqclosed</code> )
$\trianglerighteq$	<code>\trianglerighteq</code>	(same as <code>\geqclosed</code> )
$\unlhd$	<code>\unlhd</code>	(same as <code>\leqclosed</code> )
$\unrhd$	<code>\unrhd</code>	(same as <code>\geqclosed</code> )
$\vartriangleleft$	<code>\vartriangleleft</code>	(same as <code>\lessclosed</code> )
$\vartriangleright$	<code>\vartriangleright</code>	(same as <code>\gtrclosed</code> )

TABLE 142: fdsymbol Inequalities

$\gtrsim$	<code>\eqslantgtr</code>	$\lesssim$	<code>\leqslantdot</code>	$\nlessgtr$	<code>\ngtrapprox</code>
$\lessgtr$	<code>\eqslantless</code>	$\lesscc$	<code>\leqslcc</code>	$\ngtrcc$	<code>\ngtrcc</code>
$\geq$	<code>\geq</code>	$<$	<code>\less</code>	$\ngtrclosed$	<code>\ngtrclosed</code>
$\geqclosed$	<code>\geqclosed</code>	$\lessapprox$	<code>\lessapprox</code>	$\ngtrdot$	<code>\ngtrdot</code>
$\geqdot$	<code>\geqdot</code>	$\lesscc$	<code>\lesscc</code>	$\ngtreqlless$	<code>\ngtreqlless</code>
$\geqq$	<code>\geqq</code>	$\lessclosed$	<code>\lessclosed</code>	$\ngtreqqless$	<code>\ngtreqqless</code>
$\geqslant$	<code>\geqslant</code>	$\lessdot$	<code>\lessdot</code>	$\ngtreqslantless$	<code>\ngtreqslantless</code>
$\geqslantdot$	<code>\geqslantdot</code>	$\lesseqgtr$	<code>\lesseqgtr</code>	$\ngtrless$	<code>\ngtrless</code>
$\geqslcc$	<code>\geqslcc</code>	$\lesseqqgtr$	<code>\lesseqqgtr</code>	$\ngtrsim$	<code>\ngtrsim</code>
$\gg$	<code>\gg</code>	$\lesseqslantgtr$	<code>\lesseqslantgtr</code>	$\nleq$	<code>\nleq</code>
$\ggg$	<code>\ggg</code>	$\lessgtr$	<code>\lessgtr</code>	$\nleqclosed$	<code>\nleqclosed</code>
$\gnaprox$	<code>\gnaprox</code>	$\lesssim$	<code>\lesssim</code>	$\nleqdot$	<code>\nleqdot</code>
$\gneq$	<code>\gneq</code>	$\ll$	<code>\ll</code>	$\nleqq$	<code>\nleqq</code>
$\gneqq$	<code>\gneqq</code>	$\lll$	<code>\lll</code>	$\nleqslant$	<code>\nleqslant</code>
$\gnsim$	<code>\gnsim</code>	$\lnapprox$	<code>\lnapprox</code>	$\nleqslantdot$	<code>\nleqslantdot</code>
$\gtr$	<code>\gtr</code>	$\lneq$	<code>\lneq</code>	$\nleqslcc$	<code>\nleqslcc</code>
$\gtrapprox$	<code>\gtrapprox</code>	$\lneqq$	<code>\lneqq</code>	$\nless$	<code>\nless</code>
$\gtrcc$	<code>\gtrcc</code>	$\lnsim$	<code>\lnsim</code>	$\nlessapprox$	<code>\nlessapprox</code>
$\gtrclosed$	<code>\gtrclosed</code>	$\neqslantgtr$	<code>\neqslantgtr</code>	$\nlesscc$	<code>\nlesscc</code>
$\gtrdot$	<code>\gtrdot</code>	$\neqslantless$	<code>\neqslantless</code>	$\nlessclosed$	<code>\nlessclosed</code>
$\gtreqlless$	<code>\gtreqlless</code>	$\ngeq$	<code>\ngeq</code>	$\nlessdot$	<code>\nlessdot</code>
$\gtreqqless$	<code>\gtreqqless</code>	$\ngeqclosed$	<code>\ngeqclosed</code>	$\nlesseqgtr$	<code>\nlesseqgtr</code>
$\gtreqlslantless$	<code>\gtreqlslantless</code>	$\ngeqdot$	<code>\ngeqdot</code>	$\nlesseqqgtr$	<code>\nlesseqqgtr</code>
$\gtrless$	<code>\gtrless</code>	$\ngeqq$	<code>\ngeqq</code>	$\nlesseqslantgtr$	<code>\nlesseqslantgtr</code>
$\gtrsim$	<code>\gtrsim</code>	$\ngeqslant$	<code>\ngeqslant</code>	$\nlessgtr$	<code>\nlessgtr</code>
$\leq$	<code>\leq</code>	$\ngeqslantdot$	<code>\ngeqslantdot</code>	$\nlesssim$	<code>\nlesssim</code>
$\leqclosed$	<code>\leqclosed</code>	$\ngeqslcc$	<code>\ngeqslcc</code>	$\nll$	<code>\nll</code>
$\leqdot$	<code>\leqdot</code>	$\ngg$	<code>\ngg</code>	$\nlll$	<code>\nlll</code>
$\leqq$	<code>\leqq</code>	$\nggg$	<code>\nggg</code>		
$\leqslant$	<code>\leqslant</code>	$\ngtr$	<code>\ngtr</code>		

`fdsymbol` defines synonyms for some of the preceding symbols:

$\geq$	<code>\ge</code>	$\lesdot$	<code>\lesdot</code>	$\ngtcc$	<code>\ngtcc</code>
$\geqclosed$	<code>\gescc</code>	$\lesg$	<code>\lesg</code>	$\ngtreqllesslant$	<code>\ngtreqllesslant</code>

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$\ni$	<code>\gesdot</code>	$\ni$	<code>\lesseqgtrslant</code>	$\nless$	<code>\nlescc</code>
$\ni$	<code>\gesl</code>	$\triangleleft$	<code>\lhd</code>	$\nlessdot$	<code>\nlesdot</code>
$\ni$	<code>\gggtr</code>	$\lll$	<code>\llless</code>	$\nlessg$	<code>\nlesg</code>
$\triangleright$	<code>\gtcc</code>	$\triangleleft$	<code>\ltcc</code>	$\nlesseqgtrslant$	<code>\nlesseqgtrslant</code>
$\ni$	<code>\gtreqlessslant</code>	$\nless$	<code>\lvertneqq</code>	$\nltcc$	<code>\nltcc</code>
$\nless$	<code>\gvertneqq</code>	$\nless$	<code>\ngescc</code>	$\triangleright$	<code>\rhd</code>
$\triangleleft$	<code>\le</code>	$\nlessdot$	<code>\ngesdot</code>	$\triangleleft$	<code>\unlhd</code>
$\triangleleft$	<code>\lescc</code>	$\nless$	<code>\ngesl</code>	$\triangleright$	<code>\unrhd</code>

TABLE 143: boisk Inequalities

$\ni$	<code>\eqslantgtr</code>	$\triangleright$	<code>\gtcir</code>	$\nless$	<code>\lesseqgtr</code>	$\nless$	<code>\ngeq</code>
$\triangleleft$	<code>\eqslantless</code>	$\ni$	<code>\gtrapprox</code>	$\triangleleft$	<code>\lessgtr</code>	$\nless$	<code>\ngeqq</code>
$\ni$	<code>\geqq</code>	$\ni$	<code>\gtreqless</code>	$\nless$	<code>\lesssim</code>	$\nless$	<code>\ngeqslant</code>
$\ni$	<code>\geqslant</code>	$\ni$	<code>\gtreqqlless</code>	$\lll$	<code>\lll</code>	$\nless$	<code>\ngtr</code>
$\ni$	<code>\ggg</code>	$\ni$	<code>\gtrless</code>	$\nless$	<code>\lnapprox</code>	$\nless$	<code>\nleq</code>
$\nless$	<code>\glj</code>	$\nless$	<code>\gtrsim</code>	$\nless$	<code>\lneq</code>	$\nless$	<code>\nleqq</code>
$\nless$	<code>\gnapprox</code>	$\nless$	<code>\gvertneqq</code>	$\nless$	<code>\lneqq</code>	$\nless$	<code>\nleqslant</code>
$\nless$	<code>\gneq</code>	$\ni$	<code>\leqq</code>	$\nless$	<code>\lnsim</code>	$\nless$	<code>\nless</code>
$\nless$	<code>\gneqq</code>	$\triangleleft$	<code>\leqslant</code>	$\triangleleft$	<code>\Lt</code>		
$\nless$	<code>\gnsim</code>	$\ni$	<code>\lessapprox</code>	$\triangleleft$	<code>\ltcir</code>		
$\triangleright$	<code>\Gt</code>	$\nless$	<code>\lesseqgtr</code>	$\nless$	<code>\lvertneqq</code>		

TABLE 144: stix Inequalities

$\ni$	<code>\egsdot</code>	$\nless$	<code>\gtquest</code>	$\nless$	<code>\lnsim</code>
$\triangleleft$	<code>\elsdot</code>	$\ni$	<code>\gtrapprox</code>	$\nless$	<code>\lsime</code>
$\triangleleft$	<code>\eqgtr</code>	$\nless$	<code>\gtrarr</code>	$\nless$	<code>\lsimg</code>
$\triangleleft$	<code>\eqless</code>	$\triangleright$	<code>\gtrdot</code>	$\triangleleft$	<code>\Lt</code>
$\nless$	<code>\eqqgtr</code>	$\ni$	<code>\gtreqless</code>	$\triangleleft$	<code>\ltcc</code>

*(continued on next page)*

*(continued from previous page)*

$\leqslant$	<code>\leqless</code>	$\gtrless$	<code>\gtreqless</code>	$\ltcirc$	<code>\ltcir</code>
$\leqslantgtr$	<code>\leqqlantgtr</code>	$\gtrless$	<code>\gtrless</code>	$\ltilarr$	<code>\ltilarr</code>
$\leqslantless$	<code>\leqqlantless</code>	$\gtrsim$	<code>\gtrsim</code>	$\ltquest$	<code>\ltquest</code>
$\leslantgtr$	<code>\leslantgtr</code>	$\gvertneqq$	<code>\gvertneqq</code>	$\lvertneqq$	<code>\lvertneqq</code>
$\leslantless$	<code>\leslantless</code>	$\lat$	<code>\lat</code>	$\neqslantgtr$	<code>\neqslantgtr</code>
$\geq$	<code>\geq</code>	$\late$	<code>\late</code>	$\neqslantless$	<code>\neqslantless</code>
$\geqq$	<code>\geqq</code>	$\leftarrowless$	<code>\leftarrowless</code>	$\ngeq$	<code>\ngeq</code>
$\geqqslant$	<code>\geqqslant</code>	$\leq$	<code>\leq</code>	$\ngeqq$	<code>\ngeqq</code>
$\geqslant$	<code>\geqslant</code>	$\leqq$	<code>\leqq</code>	$\ngeqslant$	<code>\ngeqslant</code>
$\gescc$	<code>\gescc</code>	$\leqqslant$	<code>\leqqslant</code>	$\ngg$	<code>\ngg</code>
$\gesdot$	<code>\gesdot</code>	$\leqslant$	<code>\leqslant</code>	$\ngtr$	<code>\ngtr</code>
$\gesdoto$	<code>\gesdoto</code>	$\lescc$	<code>\lescc</code>	$\ngtrless$	<code>\ngtrless</code>
$\gesdoto1$	<code>\gesdoto1</code>	$\lesdot$	<code>\lesdot</code>	$\ngtrsim$	<code>\ngtrsim</code>
$\gesles$	<code>\gesles</code>	$\lesdoto$	<code>\lesdoto</code>	$\nleq$	<code>\nleq</code>
$\gg$	<code>\gg</code>	$\lesdotor$	<code>\lesdotor</code>	$\nleqq$	<code>\nleqq</code>
$\ggg$	<code>\ggg</code>	$\lesges$	<code>\lesges</code>	$\nleqslant$	<code>\nleqslant</code>
$\gggnest$	<code>\gggnest</code>	$\lessapprox$	<code>\lessapprox</code>	$\nless$	<code>\nless</code>
$\gla$	<code>\gla</code>	$\lessdot$	<code>\lessdot</code>	$\nlessgtr$	<code>\nlessgtr</code>
$\glE$	<code>\glE</code>	$\lesseqgtr$	<code>\lesseqgtr</code>	$\nlesssim$	<code>\nlesssim</code>
$\glj$	<code>\glj</code>	$\lesseqqgtr$	<code>\lesseqqgtr</code>	$\nll$	<code>\nll</code>
$\gnapprox$	<code>\gnapprox</code>	$\lessgtr$	<code>\lessgtr</code>	$\partialmeetcontraction$	<code>\partialmeetcontraction</code>
$\gneq$	<code>\gneq</code>	$\lesssim$	<code>\lesssim</code>	$\rightarrowgtr$	<code>\rightarrowgtr</code>
$\gneqq$	<code>\gneqq</code>	$\lgE$	<code>\lgE</code>	$\simE$	<code>\simE</code>
$\gnsim$	<code>\gnsim</code>	$\ll$	<code>\ll</code>	$\simgtr$	<code>\simgtr</code>
$\gsime$	<code>\gsime</code>	$\lll$	<code>\lll</code>	$\simlE$	<code>\simlE</code>
$\gsiml$	<code>\gsiml</code>	$\lllnest$	<code>\lllnest</code>	$\simless$	<code>\simless</code>
$\Gt$	<code>\Gt</code>	$\lnapprox$	<code>\lnapprox</code>	$\smt$	<code>\smt</code>
$\gtcc$	<code>\gtcc</code>	$\lneq$	<code>\lneq</code>	$\smte$	<code>\smte</code>
$\gtcir$	<code>\gtcir</code>	$\lneqq$	<code>\lneqq</code>		

stix defines `\le` as a synonym for `\leq`, `\ge` as a synonym for `\geq`, `\llless` as a synonym for `\lll`, `\gggtr` as a synonym for `\ggg`, `\nle` as a synonym for `\nleq`, and `\nge` as a synonym for `\ngeq`.

TABLE 145: logix Inequalities and Equalities

$\ominus$	<code>\CircEq</code>	$>$	<code>\Gr</code>	$\not<$	<code>\NotLs</code>	$>$	<code>\SbGr</code>
$\otimes$	<code>\CircGr</code>	$\geq$	<code>\Gre</code>	$\not\leq$	<code>\NotLse</code>	$\geq$	<code>\SbGre</code>
$\oslash$	<code>\CircGre</code>	$<$	<code>\Ls</code>	$\not>$	<code>\NotSbGr</code>	$<$	<code>\SbLs</code>
$\circledleft$	<code>\CircLs</code>	$\leq$	<code>\Lse</code>	$\not\geq$	<code>\NotSbGre</code>	$\leq$	<code>\SbLse</code>
$\circledright$	<code>\CircLse</code>	$\neq$	<code>\NotEq</code>	$\not\neq$	<code>\NotSbLs</code>	$\approx$	<code>\Sm</code>
$\circledcirc$	<code>\CircSm</code>	$\not\neq$	<code>\NotGr</code>	$\not\leq$	<code>\NotSbLse</code>		
$=$	<code>\Eq</code>	$\not\leq$	<code>\NotGre</code>	$\not\neq$	<code>\NotSm</code>		

logix requires either Lua $\LaTeX$  or Xe $\LaTeX$ .

TABLE 146:  $\mathcal{AMS}$  Triangle Relations

$\blacktriangleleft$	<code>\blacktriangleleft</code>	$\ntriangleright$	<code>\ntriangleright</code>	$\trianglerighteq$	<code>\trianglerighteq</code>
$\blacktriangleright$	<code>\blacktriangleright</code>	$\ntrianglelefteq$	<code>\ntrianglelefteq</code>	$\triangleleft$	<code>\vartriangleleft</code>
$\triangleleft$	<code>\triangleleft</code>	$\trianglelefteq$	<code>\trianglelefteq</code>	$\triangleright$	<code>\vartriangleright</code>
$\trianglelefteq$	<code>\trianglelefteq</code>	$\trianglelefteq$	<code>\trianglelefteq</code>		

TABLE 147: stmaryrd Triangle Relations

$\triangleleft$	<code>\trianglelefteqslant</code>	$\triangleright$	<code>\trianglerighteqslant</code>
$\ntriangleleft$	<code>\ntrianglelefteqslant</code>	$\ntriangleright$	<code>\ntrianglerighteqslant</code>

TABLE 148: mathabx Triangle Relations

$\ntriangleleft$	<code>\ntriangleleft</code>	$\triangleleft$	<code>\triangleleft</code>	$\vartriangleleft$	<code>\vartriangleleft</code>
$\ntrianglelefteq$	<code>\ntrianglelefteq</code>	$\trianglelefteq$	<code>\trianglelefteq</code>	$\vartriangleright$	<code>\vartriangleright</code>
$\ntriangleright$	<code>\ntriangleright</code>	$\triangleright$	<code>\triangleright</code>		
$\ntrianglerighteq$	<code>\ntrianglerighteq</code>	$\trianglerighteq$	<code>\trianglerighteq</code>		

TABLE 149: MnSymbol Triangle Relations

▼	<code>\filledmedtriangledown</code>	△	<code>\largetriangleup</code>	▽	<code>\smalltriangledown</code>
◀	<code>\filledmedtriangleleft</code>	▽	<code>\medtriangledown</code>	◁	<code>\smalltriangleleft</code>
▶	<code>\filledmedtriangleright</code>	◁	<code>\medtriangleleft</code>	▷	<code>\smalltriangleright</code>
▲	<code>\filledmedtriangleup</code>	▷	<code>\medtriangleright</code>	△	<code>\smalltriangleup</code>
▼	<code>\filledtriangledown</code>	△	<code>\medtriangleup</code>	≐	<code>\triangleeq</code>
◀	<code>\filledtriangleleft</code>	≠	<code>\ntriangleeq</code>	◁	<code>\triangleleftteq</code>
▶	<code>\filledtriangleright</code>	≠	<code>\ntriangleleft</code>	▷	<code>\trianglerighteq</code>
▲	<code>\filledtriangleup</code>	≠	<code>\ntriangleleftteq</code>	◁	<code>\vartriangleleft</code>
▽	<code>\largetriangledown</code>	≠	<code>\ntriangleright</code>	▷	<code>\vartriangleright</code>
◁	<code>\largetriangleleft</code>	≠	<code>\ntrianglerighteq</code>		
▷	<code>\largetriangleright</code>	⊗	<code>\otriangle</code>		

MnSymbol additionally defines synonyms for many of the preceding symbols: `\triangleeq` is a synonym for `\triangleeq`; `\lhd` and `\lessclosed` are synonyms for `\vartriangleleft`; `\rhd` and `\gtrclosed` are synonyms for `\vartriangleright`; `\unlhd` and `\leqclosed` are synonyms for `\triangleleftteq`; `\unrhd` and `\geqclosed` are synonyms for `\trianglerighteq`; `\blacktriangledown`, `\blacktriangleleft`, `\blacktriangleright`, and `\blacktriangle` [*sic*] are synonyms for, respectively, `\filledmedtriangledown`, `\filledmedtriangleleft`, `\filledmedtriangleright`, and `\filledmedtriangleup`; `\triangleright` is a synonym for `\medtriangleright`; `\triangle`, `\vartriangle`, and `\bigtriangleup` are synonyms for `\medtriangleup`; `\triangleleft` is a synonym for `\medtriangleleft`; `\triangledown` and `\bigtriangledown` are synonyms for `\medtriangledown`; `\nlessclosed` is a synonym for `\ntriangleleft`; `\ngtrclosed` is a synonym for `\ntriangleright`; `\nleqclosed` is a synonym for `\ntriangleleftteq`; and `\ngeqclosed` is a synonym for `\ntrianglerighteq`.

The title “Triangle Relations” is a bit of a misnomer here as only `\triangleeq` and `\ntriangleeq` are defined as T<sub>E</sub>X relations (class 3 symbols). The `\largetriangle...` symbols are defined as T<sub>E</sub>X “ordinary” characters (class 0) and all of the remaining characters are defined as T<sub>E</sub>X binary operators (class 2).

TABLE 150: fdsymbol Triangle Relations

$\geq$	<code>\geqclosed</code>	$\nabla$	<code>\medtriangledown</code>	$\blacktriangleleft$	<code>\smallblacktriangleleft</code>
$\triangleright$	<code>\gtrclosed</code>	$\triangleleft$	<code>\medtriangleleft</code>	$\blacktriangleright$	<code>\smallblacktriangleright</code>
$\nabla$	<code>\largetriangledown</code>	$\triangleright$	<code>\medtriangleright</code>	$\blacktriangleup$	<code>\smallblacktriangleup</code>
$\triangle$	<code>\largetriangleup</code>	$\triangle$	<code>\medtriangleup</code>	$\nabla$	<code>\smalltriangledown</code>
$\leq$	<code>\leqclosed</code>	$\not\geq$	<code>\ngeqclosed</code>	$\triangleleft$	<code>\smalltriangleleft</code>
$\triangleleft$	<code>\lessclosed</code>	$\not\triangleright$	<code>\ngtrclosed</code>	$\triangleright$	<code>\smalltriangleright</code>
$\blacktriangledown$	<code>\medblacktriangledown</code>	$\not\leq$	<code>\nleqclosed</code>	$\triangle$	<code>\smalltriangleup</code>
$\blacktriangleleft$	<code>\medblacktriangleleft</code>	$\not\triangleleft$	<code>\nlessclosed</code>	$\triangleq$	<code>\triangleeq</code>
$\blacktriangleright$	<code>\medblacktriangleright</code>	$\not\triangleright$	<code>\ntrianglerighteq</code>		
$\blacktriangleup$	<code>\medblacktriangleup</code>	$\blacktriangledown$	<code>\smallblacktriangledown</code>		

`fdsymbol` defines synonyms for almost all of the preceding symbols:

$\nabla$	<code>\bigtriangledown</code>	$\not\triangleleft$	<code>\ntrianglelefteq</code>	$\triangleq$	<code>\triangleq</code>
$\triangle$	<code>\bigtriangleup</code>	$\not\triangleright$	<code>\ntrianglerighteq</code>	$\triangleright$	<code>\trianglerighteq</code>
$\blacktriangle$	<code>\blacktriangle</code>	$\not\triangleright$	<code>\ntrianglerighteq</code>	$\geq$	<code>\trianglerighteq</code>
$\blacktriangledown$	<code>\blacktriangledown</code>	$\triangle$	<code>\triangle</code>	$\triangle$	<code>\vartriangle</code>
$\blacktriangleleft$	<code>\blacktriangleleft</code>	$\nabla$	<code>\triangledown</code>	$\triangleleft$	<code>\vartriangleleft</code>
$\blacktriangleright$	<code>\blacktriangleright</code>	$\triangleleft$	<code>\triangleleft</code>	$\triangleright$	<code>\vartriangleright</code>
$\not\triangleleft$	<code>\ntriangleleft</code>	$\leq$	<code>\trianglelefteq</code>		

The title “Triangle Relations” is a bit of a misnomer here as only `\triangleeq` and `\ntriangleeq` are defined as  $\TeX$  relations (class 3 symbols). The `\largetriangle...` symbols are defined as  $\TeX$  “ordinary” characters (class 0) and all of the remaining characters are defined as  $\TeX$  binary operators (class 2).

TABLE 151: boisik Triangle Relations

$\not\triangleleft$	<code>\ntriangleleft</code>	$\trianglelefteq$	<code>\trianglelefteq</code>	$\vartriangleleft$	<code>\vartriangleleft</code>
$\not\trianglelefteq$	<code>\ntrianglelefteq</code>	$\trianglelefteqslant$	<code>\trianglelefteqslant</code>	$\triangle$	<code>\vartriangle</code>
$\not\triangleright$	<code>\ntriangleright</code>	$\triangleright$	<code>\triangleright</code>	$\triangleleft$	<code>\vartriangleleft</code>
$\not\trianglerighteq$	<code>\ntrianglerighteq</code>	$\trianglerighteq$	<code>\trianglerighteq</code>	$\triangleright$	<code>\vartriangleright</code>
$\triangleleft$	<code>\triangleleft</code>	$\trianglerighteqslant$	<code>\trianglerighteqslant</code>		

TABLE 152: stix Triangle Relations

$\trianglelefteq$	<code>\ltriangleq</code>	$\not\triangleright$	<code>\nvartriangleright</code>	$\triangle$	<code>\vartriangle</code>
$\triangleleft$	<code>\ltrivb</code>	$\triangleright$	<code>\rtriltri</code>	$\triangleleft$	<code>\vartriangleleft</code>
$\not\trianglelefteq$	<code>\ntrianglelefteq</code>	$\trianglelefteq$	<code>\trianglelefteq</code>	$\triangleright$	<code>\vartriangleright</code>
$\not\trianglerighteq$	<code>\ntrianglerighteq</code>	$\triangleq$	<code>\triangleq</code>	$\triangleright$	<code>\vbrtri</code>
$\not\triangleleft$	<code>\nvartriangleleft</code>	$\trianglerighteq$	<code>\trianglerighteq</code>		

TABLE 153: Arrows

$\Downarrow$	<code>\Downarrow</code>	$\longleftarrow$	<code>\longleftarrow</code>	$\nwarrow$	<code>\nwarrow</code>
$\downarrow$	<code>\downarrow</code>	$\Longleftarrow$	<code>\Longleftarrow</code>	$\Rightarrow$	<code>\Rightarrow</code>
$\hookleftarrow$	<code>\hookleftarrow</code>	$\longleftrightarrow$	<code>\longleftrightarrow</code>	$\rightarrow$	<code>\rightarrow</code>
$\hookrightarrow$	<code>\hookrightarrow</code>	$\Longleftrightarrow$	<code>\Longleftrightarrow</code>	$\searrow$	<code>\searrow</code>
$\leadsto$	<code>\leadsto*</code>	$\mapsto$	<code>\mapsto</code>	$\swarrow$	<code>\swarrow</code>
$\leftarrow$	<code>\leftarrow</code>	$\Longrightarrow$	<code>\Longrightarrow</code>	$\Uparrow$	<code>\Uparrow</code>
$\Leftarrow$	<code>\Leftarrow</code>	$\longrightarrow$	<code>\longrightarrow</code>	$\Uparrow$	<code>\Uparrow</code>
$\Leftrightarrow$	<code>\Leftrightarrow</code>	$\mapsto$	<code>\mapsto</code>	$\updownarrow$	<code>\updownarrow</code>
$\leftrightsquigarrow$	<code>\leftrightsquigarrow</code>	$\nearrow$	<code>\nearrow†</code>	$\Updownarrow$	<code>\Updownarrow</code>

\* Not predefined by the  $\text{\LaTeX} 2_{\epsilon}$  core. Use the `latexsym` package to expose this symbol.

† See the note beneath Table 270 for information about how to put a diagonal arrow across a mathematical expression (as in “ $\nabla \cdot \vec{B}$ ”).

TABLE 154: Harpoons

$\leftharpoondown$	<code>\leftharpoondown</code>	$\rightharpoondown$	<code>\rightharpoondown</code>	$\rightleftharpoons$	<code>\rightleftharpoons</code>
$\leftharpoonup$	<code>\leftharpoonup</code>	$\rightharpoonup$	<code>\rightharpoonup</code>		

TABLE 155: `textcomp` Text-mode Arrows

$\text{\textdownarrow}$	<code>\textdownarrow</code>	$\text{\textrightarrow}$	<code>\textrightarrow</code>
$\text{\textleftarrow}$	<code>\textleftarrow</code>	$\text{\textuparrow}$	<code>\textuparrow</code>

TABLE 156:  $\mathcal{AMS}$  Arrows

$\circlearrowleft$	<code>\circlearrowleft</code>	$\leftrightsquigarrow$	<code>\leftrightsquigarrow</code>	$\rightleftarrows$	<code>\rightleftarrows</code>
$\circlearrowright$	<code>\circlearrowright</code>	$\leftrightsquigarrow$	<code>\leftrightsquigarrow</code>	$\rightrightarrows$	<code>\rightrightarrows</code>
$\curvearrowleft$	<code>\curvearrowleft</code>	$\Lleftarrow$	<code>\Lleftarrow</code>	$\rightsquigarrow$	<code>\rightsquigarrow</code>
$\curvearrowright$	<code>\curvearrowright</code>	$\Lleftarrow$	<code>\Lleftarrow</code>	$\Rsh$	<code>\Rsh</code>
$\dashleftarrow$	<code>\dashleftarrow</code>	$\looparrowleft$	<code>\looparrowleft</code>	$\twoheadleftarrow$	<code>\twoheadleftarrow</code>
$\dashrightarrow$	<code>\dashrightarrow</code>	$\looparrowright$	<code>\looparrowright</code>	$\twoheadrightarrow$	<code>\twoheadrightarrow</code>
$\downdownarrows$	<code>\downdownarrows</code>	$\Lsh$	<code>\Lsh</code>	$\upuparrows$	<code>\upuparrows</code>
$\leftarrowtail$	<code>\leftarrowtail</code>	$\rightarrowtail$	<code>\rightarrowtail</code>		

TABLE 157:  $\mathcal{AMS}$  Negated Arrows

$\nleftarrow$	<code>\nleftarrow</code>	$\nLeftrightarrow$	<code>\nLeftrightarrow</code>	$\nrightarrow$	<code>\nrightarrow</code>
$\leftarrow$	<code>\leftarrow</code>	$\nleftrightsquigarrow$	<code>\nleftrightsquigarrow</code>	$\rightarrow$	<code>\rightarrow</code>



TABLE 158:  $\mathcal{AMS}$  Harpoons

$\Downarrow$	<code>\downharpoonleft</code>	$\Leftrightarrow$	<code>\leftrightharpoons</code>	$\Uparrow$	<code>\upharpoonleft</code>
$\Downarrow$	<code>\downharpoonright</code>	$\Rrightarrow$	<code>\rightleftharpoons</code>	$\Uparrow$	<code>\upharpoonright</code>

TABLE 159: `stmaryrd` Arrows

$\leftarrow$	<code>\leftarrowtriangle</code>	$\Leftarrow$	<code>\Mapsfrom</code>	$\leftarrow$	<code>\shortleftarrow</code>
$\Leftrightarrow$	<code>\leftrightharweq</code>	$\mapsto$	<code>\mapsto</code>	$\rightarrow$	<code>\shortrightarrow</code>
$\Leftrightarrow$	<code>\leftrightharrowtriangle</code>	$\mapsto$	<code>\Mapsto</code>	$\uparrow$	<code>\shortuparrow</code>
$\lightning$	<code>\lightning</code>	$\nearrow$	<code>\nnearrow</code>	$\searrow$	<code>\ssearrow</code>
$\Leftarrow$	<code>\Longmapsfrom</code>	$\nwarrow$	<code>\nnwarrow</code>	$\swarrow$	<code>\sswarrow</code>
$\longmapsto$	<code>\longmapsfrom</code>	$\rightarrow$	<code>\rightarrowtriangle</code>		
$\Longrightarrow$	<code>\Longmapsto</code>	$\downarrow$	<code>\shortdownarrow</code>		

TABLE 160: `txfonts/pxfonts` Arrows

$\boxdotleft$	<code>\boxdotLeft</code>	$\circrightarrow$	<code>\circleddotright</code>	$\diamondleftarrow$	<code>\Diamondleft</code>
$\boxdotleft$	<code>\boxdotleft</code>	$\circleftarrow$	<code>\circleleft</code>	$\diamondrightarrow$	<code>\Diamondright</code>
$\boxdotright$	<code>\boxdotright</code>	$\circrightarrow$	<code>\circcleright</code>	$\diamondrightarrow$	<code>\DiamondRight</code>
$\boxdotright$	<code>\boxdotRight</code>	$\dashrightarrow$	<code>\dashleftrightharrow</code>	$\leftleftarrows$	<code>\leftsquigarrow</code>
$\boxleftarrow$	<code>\boxLeft</code>	$\dottedleftarrow$	<code>\DiamonddotLeft</code>	$\nearrow$	<code>\Nearrow</code>
$\boxleftarrow$	<code>\boxleft</code>	$\dottedleftarrow$	<code>\Diamonddotleft</code>	$\nwarrow$	<code>\Nwarrow</code>
$\boxrightarrow$	<code>\boxright</code>	$\dottedrightarrow$	<code>\Diamonddotright</code>	$\Rightarrow$	<code>\Rrightarrow</code>
$\boxrightarrow$	<code>\boxRight</code>	$\dottedrightarrow$	<code>\DiamonddotRight</code>	$\searrow$	<code>\Searrow</code>
$\circleftarrow$	<code>\circleddotleft</code>	$\dottedleftarrow$	<code>\DiamondLeft</code>	$\swarrow$	<code>\Swarrow</code>

TABLE 161: `mathabx` Arrows

$\circleftarrow$	<code>\circleftarrow</code>	$\leftarrow$	<code>\leftarrow</code>	$\nearrow$	<code>\nearrow</code>
$\circrightarrow$	<code>\circrightarrow</code>	$\leftleftarrows$	<code>\leftleftarrows</code>	$\restriction$	<code>\restriction</code>
$\curvearrowleft$	<code>\curvearrowbotleft</code>	$\leftrightarrows$	<code>\leftrightarrows</code>	$\rightarrow$	<code>\rightarrow</code>
$\curvearrowright$	<code>\curvearrowbotleft</code>	$\leftrightsquigarrow$	<code>\leftrightsquigarrow</code>	$\rightleftarrows$	<code>\rightleftarrows</code>
$\curvearrowleft$	<code>\curvearrowbotright</code>	$\leftsquigarrow$	<code>\leftsquigarrow</code>	$\rightrightarrows$	<code>\rightrightarrows</code>
$\curvearrowright$	<code>\curvearrowbotright</code>	$\leftsquigarrow$	<code>\leftsquigarrow</code>	$\rightsquigarrow$	<code>\rightsquigarrow</code>
$\curvearrowleft$	<code>\curvearrowleft</code>	$\lefttorightarrow$	<code>\lefttorightarrow</code>	$\righttoleftarrow$	<code>\righttoleftarrow</code>
$\curvearrowright$	<code>\curvearrowleft</code>	$\looparrowleft$	<code>\looparrowdownleft</code>	$\Rsh$	<code>\Rsh</code>
$\dLsh$	<code>\dLsh</code>	$\looparrowright$	<code>\looparrowdownright</code>	$\searrow$	<code>\searrow</code>
$\downdownarrows$	<code>\downdownarrows</code>	$\looparrowleft$	<code>\looparrowleft</code>	$\swarrow$	<code>\swarrow</code>
$\downtoupward$	<code>\downtoupward</code>	$\looparrowright$	<code>\looparrowright</code>	$\updownarrows$	<code>\updownarrows</code>
$\downuparrows$	<code>\downuparrows</code>	$\Lsh$	<code>\Lsh</code>	$\uptodownarrow$	<code>\uptodownarrow</code>
$\drsh$	<code>\drsh</code>	$\nearrow$	<code>\nearrow</code>	$\upuparrows$	<code>\upuparrows</code>

TABLE 162: mathabx Negated Arrows

$\nLeftarrow$	<code>\nLeftarrow</code>	$\leftrightarrow$	<code>\leftrightharrow</code>	$\rightarrow$	<code>\rightarrow</code>
$\leftarrow$	<code>\leftarrow</code>	$\Leftrightarrow$	<code>\Leftrightharrow</code>	$\Rightarrow$	<code>\Rightarrow</code>

TABLE 163: mathabx Harpoons

$\bar{\leftarrow}$	<code>\barleftarrow</code>	$\leftarrow$	<code>\leftarrow</code>	$\bar{\rightarrow}$	<code>\barrightarrow</code>
$\bar{\Rightarrow}$	<code>\barRightarrow</code>	$\Leftarrow$	<code>\Leftarrow</code>	$\bar{\Rightarrow}$	<code>\barRightarrow</code>
$\Downharpoonright$	<code>\Downharpoonright</code>	$\leftrightarrow$	<code>\leftrightarrow</code>	$\Downharpoonleft$	<code>\Downharpoonleft</code>
$\Downharpoonleft$	<code>\Downharpoonleft</code>	$\Leftarrow$	<code>\Leftarrow</code>	$\Uparrow$	<code>\Uparrow</code>
$\Downharpoonright$	<code>\Downharpoonright</code>	$\Rightarrow$	<code>\Rightarrow</code>	$\Uparrow$	<code>\Uparrow</code>
$\Downharpoonleft$	<code>\Downharpoonleft</code>	$\rightarrow$	<code>\rightarrow</code>	$\Uparrow$	<code>\Uparrow</code>
$\Leftbarharpoon$	<code>\Leftbarharpoon</code>	$\rightarrow$	<code>\rightarrow</code>		
$\leftarrow$	<code>\leftarrow</code>	$\leftrightarrow$	<code>\leftrightarrow</code>		

TABLE 164: MnSymbol Arrows

$\curvearrowright$	<code>\curvearrowright</code>	$\longleftarrow$	<code>\longleftarrow</code>	$\rhookrightarrow$	<code>\rhookrightarrow</code>
$\curvearrowleft$	<code>\curvearrowleft</code>	$\Longleftarrow$	<code>\Longleftarrow</code>	$\uphookrightarrow$	<code>\uphookrightarrow</code>
$\curvearrowright$	<code>\curvearrowright</code>	$\longleftrightarrow$	<code>\longleftrightarrow</code>	$\rightarrow$	<code>\rightarrow</code>
$\curvearrowleft$	<code>\curvearrowleft</code>	$\Longleftrightarrow$	<code>\Longleftrightarrow</code>	$\Rightarrow$	<code>\Rightarrow</code>
$\curvearrowright$	<code>\curvearrowright</code>	$\mapsto$	<code>\mapsto</code>	$\rightarrowtail$	<code>\rightarrowtail</code>
$\curvearrowleft$	<code>\curvearrowleft</code>	$\rightarrow$	<code>\rightarrow</code>	$\rightleftarrows$	<code>\rightleftarrows</code>
$\curvearrowright$	<code>\curvearrowright</code>	$\Rightarrow$	<code>\Rightarrow</code>	$\rightsquigarrow$	<code>\rightsquigarrow</code>
$\curvearrowdown$	<code>\curvearrowdown</code>	$\looparrowleft$	<code>\looparrowleft</code>	$\mapsto$	<code>\mapsto</code>
$\dashedownarrow$	<code>\dashedownarrow</code>	$\looparrowright$	<code>\looparrowright</code>	$\rightarrowtail$	<code>\rightarrowtail</code>
$\dashedleftarrow$	<code>\dashedleftarrow</code>	$\Lsh$	<code>\Lsh</code>	$\rightarrowtail$	<code>\rightarrowtail</code>
$\dashednearrow$	<code>\dashednearrow</code>	$\nearrow$	<code>\nearrow</code>	$\Rightarrow$	<code>\Rightarrow</code>
$\dashednwarrow$	<code>\dashednwarrow</code>	$\nearrow$	<code>\nearrow</code>	$\Rsh$	<code>\Rsh</code>
$\dashedrightarrow$	<code>\dashedrightarrow</code>	$\nearrowtail$	<code>\nearrowtail</code>	$\searrow$	<code>\searrow</code>
$\dashedsearrow$	<code>\dashedsearrow</code>	$\nearrow$	<code>\nearrow</code>	$\searrow$	<code>\searrow</code>
$\dashedswarrow$	<code>\dashedswarrow</code>	$\nearrow$	<code>\nearrow</code>	$\searrowtail$	<code>\searrowtail</code>
$\dasheduparrow$	<code>\dasheduparrow</code>	$\nearrow$	<code>\nearrow</code>	$\searrow$	<code>\searrow</code>
$\Downarrow$	<code>\Downarrow</code>	$\nearrow$	<code>\nearrow</code>	$\searrow$	<code>\searrow</code>
$\downarrow$	<code>\downarrow</code>	$\nearrow$	<code>\nearrow</code>	$\searrow$	<code>\searrow</code>
$\downarrowtail$	<code>\downarrowtail</code>	$\nearrow$	<code>\nearrow</code>	$\searrow$	<code>\searrow</code>
$\downdownarrows$	<code>\downdownarrows</code>	$\nearrow$	<code>\nearrow</code>	$\searrow$	<code>\searrow</code>
$\downlsquigarrow$	<code>\downlsquigarrow</code>	$\nearrow$	<code>\nearrow</code>	$\searrow$	<code>\searrow</code>
$\downmapsto$	<code>\downmapsto</code>	$\nearrow$	<code>\nearrow</code>	$\searrow$	<code>\searrow</code>

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$\downarrow$	<code>\downrsquigarrow</code>	$\nearrow$	<code>\narrowtail</code>	$\leftrightarrow$	<code>\squigarrownesw</code>
$\updownarrow$	<code>\downuparrows</code>	$\nwarrow$	<code>\nwlsquigarrow</code>	$\nwarrow$	<code>\squigarrownwse</code>
$\circlearrowleft$	<code>\lrcirclearrowdown</code>	$\mapsto$	<code>\nwmapsto</code>	$\rightarrow$	<code>\squigarrowrightleft</code>
$\circlearrowleft$	<code>\lrcirclearrowleft</code>	$\nrightarrow$	<code>\nwnwarrows</code>	$\rightarrow$	<code>\squigarrowsenw</code>
$\circlearrowright$	<code>\lrcirclearrowright</code>	$\rightarrow$	<code>\nwrsquigarrow</code>	$\rightarrow$	<code>\squigarrowswne</code>
$\circlearrowright$	<code>\lrcirclearrowup</code>	$\rightarrow$	<code>\nwsearrow</code>	$\rightarrow$	<code>\squigarrowupdown</code>
$\curvearrowright$	<code>\lcurvearrowdown</code>	$\rightarrow$	<code>\Nwsearrow</code>	$\rightarrow$	<code>\swarrow</code>
$\curvearrowright$	<code>\lcurvearrowleft</code>	$\rightarrow$	<code>\nwsearrows</code>	$\rightarrow$	<code>\Sswarrow</code>
$\curvearrowright$	<code>\lcurvearrowne</code>	$\rightarrow$	<code>\partialvarldcircleleftint*</code>	$\rightarrow$	<code>\swarrowtail</code>
$\curvearrowright$	<code>\lcurvearrownw</code>	$\rightarrow$	<code>\partialvarldcircleleftint*</code>	$\rightarrow$	<code>\swlsquigarrow</code>
$\curvearrowright$	<code>\lcurvearrowright</code>	$\rightarrow$	<code>\partialvarldcircleleftint*</code>	$\rightarrow$	<code>\swmapsto</code>
$\curvearrowright$	<code>\lcurvearrowse</code>	$\rightarrow$	<code>\partialvarldcircleleftint*</code>	$\rightarrow$	<code>\swnearrows</code>
$\curvearrowright$	<code>\lcurvearrowsw</code>	$\rightarrow$	<code>\partialvarldcircleleftint*</code>	$\rightarrow$	<code>\swrsquigarrow</code>
$\curvearrowright$	<code>\lcurvearrowup</code>	$\rightarrow$	<code>\partialvarldcircleleftint*</code>	$\rightarrow$	<code>\swswarrows</code>
$\Leftarrow$	<code>\Leftarrow</code>	$\rightarrow$	<code>\partialvartrcircleleftint*</code>	$\rightarrow$	<code>\twoheaddownarrow</code>
$\leftarrow$	<code>\leftarrow</code>	$\rightarrow$	<code>\partialvartrcircleleftint*</code>	$\rightarrow$	<code>\twoheadleftarrow</code>
$\leftarrowtail$	<code>\leftarrowtail</code>	$\rightarrow$	<code>\rcirclearrowdown</code>	$\rightarrow$	<code>\twoheadnearrow</code>
$\leftleftarrows$	<code>\leftleftarrows</code>	$\rightarrow$	<code>\rcirclearrowleft</code>	$\rightarrow$	<code>\twoheadnarrow</code>
$\rightsquigarrow$	<code>\leftlsquigarrow</code>	$\rightarrow$	<code>\rcirclearrowright</code>	$\rightarrow$	<code>\twoheadrightarrow</code>
$\mapsto$	<code>\leftmapsto</code>	$\rightarrow$	<code>\rcirclearrowup</code>	$\rightarrow$	<code>\twoheadsearrow</code>
$\rightarrow$	<code>\leftrightharrow</code>	$\rightarrow$	<code>\rcurvearrowdown</code>	$\rightarrow$	<code>\twoheadswarrow</code>
$\rightarrow$	<code>\Leftrightarrow</code>	$\rightarrow$	<code>\rcurvearrowleft</code>	$\rightarrow$	<code>\twoheaduparrow</code>
$\rightarrow$	<code>\leftrightarrows</code>	$\rightarrow$	<code>\rcurvearrowne</code>	$\rightarrow$	<code>\uparrow</code>
$\rightarrow$	<code>\leftsquigarrow</code>	$\rightarrow$	<code>\rcurvearrownw</code>	$\rightarrow$	<code>\Uparrow</code>
$\rightarrow$	<code>\lefttrsquigarrow</code>	$\rightarrow$	<code>\rcurvearrowright</code>	$\rightarrow$	<code>\uparrowtail</code>
$\downarrow$	<code>\hookdownarrow</code>	$\rightarrow$	<code>\rcurvearrowse</code>	$\rightarrow$	<code>\updownarrow</code>
$\leftarrow$	<code>\hookleftarrow</code>	$\rightarrow$	<code>\rcurvearrowsw</code>	$\rightarrow$	<code>\Updownarrow</code>
$\rightarrow$	<code>\hooknearrow</code>	$\rightarrow$	<code>\rcurvearrowsw</code>	$\rightarrow$	<code>\updownarrow</code>
$\rightarrow$	<code>\hooknearrow</code>	$\rightarrow$	<code>\rcurvearrowup</code>	$\rightarrow$	<code>\updownarrows</code>
$\rightarrow$	<code>\hookrightarrow</code>	$\rightarrow$	<code>\rhookdownarrow</code>	$\rightarrow$	<code>\uplsquigarrow</code>
$\rightarrow$	<code>\hooksearrow</code>	$\rightarrow$	<code>\rhookleftarrow</code>	$\rightarrow$	<code>\upmapsto</code>
$\rightarrow$	<code>\hooksearrow</code>	$\rightarrow$	<code>\rhooknearrow</code>	$\rightarrow$	<code>\uprsquigarrow</code>
$\rightarrow$	<code>\hookuparrow</code>	$\rightarrow$	<code>\rhooknarrow</code>	$\rightarrow$	<code>\upuparrows</code>
$\rightarrow$	<code>\lightning</code>	$\rightarrow$	<code>\rhookrightarrow</code>		
$\Leftarrow$	<code>\Lleftarrow</code>	$\rightarrow$	<code>\rhooksearrow</code>		

MnSymbol additionally defines synonyms for some of the preceding symbols:

$\circlearrowleft$	<code>\circlearrowleft</code>	(same as <code>\rcirclearrowup</code> )
$\circlearrowright$	<code>\circlearrowright</code>	(same as <code>\lrcirclearrowup</code> )
$\curvearrowleft$	<code>\curvearrowleft</code>	(same as <code>\rcurvearrowleft</code> )
$\curvearrowright$	<code>\curvearrowright</code>	(same as <code>\lcurvearrowright</code> )
$\dashleftarrow$	<code>\dashleftarrow</code>	(same as <code>\dashedleftarrow</code> )
$\dashrightarrow$	<code>\dashrightarrow</code>	(same as <code>\dashedrightarrow</code> )
$\hookleftarrow$	<code>\hookleftarrow</code>	(same as <code>\rhookleftarrow</code> )
$\hookrightarrow$	<code>\hookrightarrow</code>	(same as <code>\lhookrightarrow</code> )
$\leadsto$	<code>\leadsto</code>	(same as <code>\rightlsquigarrow</code> )
$\leftrightsquigarrow$	<code>\leftrightsquigarrow</code>	(same as <code>\squigarrowleftright</code> )
$\mapsto$	<code>\mapsto</code>	(same as <code>\rightmapsto</code> )
$\rightsquigarrow$	<code>\rightsquigarrow</code>	(same as <code>\rightlsquigarrow</code> )

\* The `\partialvar...int` macros are intended to be used internally by MnSymbol to produce various types of integrals.

TABLE 165: MnSymbol Negated Arrows

	<code>\ncurvearrowdownup</code>		<code>\nlhooknwarrow</code>		<code>\nrightrightarrows</code>
	<code>\ncurvearrowleftright</code>		<code>\nlhookrarrow</code>		<code>\nrightrlsquigarrow</code>
	<code>\ncurvearrownesw</code>		<code>\nlhooksearrow</code>		<code>\nrightrightmapsto</code>
	<code>\ncurvearrownwse</code>		<code>\nlhookswarrow</code>		<code>\nrightrightarrows</code>
	<code>\ncurvearrowrightleft</code>		<code>\nlhookuparrow</code>		<code>\nrightrrsquigarrow</code>
	<code>\ncurvearrowsenw</code>		<code>\nLleftarrow</code>		<code>\nRrightarrow</code>
	<code>\ncurvearrowswne</code>		<code>\nnearrow</code>		<code>\nSearrow</code>
	<code>\ncurvearrowupdown</code>		<code>\nNearrow</code>		<code>\nsearrow</code>
	<code>\ndasheddownarrow</code>		<code>\nnearrowtail</code>		<code>\nsearrowtail</code>
	<code>\ndashedleftarrow</code>		<code>\nnelsquigarrow</code>		<code>\nsearrowtail</code>
	<code>\ndashednearrow</code>		<code>\nnemapsto</code>		<code>\nsemapsto</code>
	<code>\ndashednwarrow</code>		<code>\nnearrows</code>		<code>\nsearrowswarrows</code>
	<code>\ndashedrightarrow</code>		<code>\nnersquigarrow</code>		<code>\nsearrowsquigarrow</code>
	<code>\ndashedsearrow</code>		<code>\nNeswarrow</code>		<code>\nsearrowsearrows</code>
	<code>\ndashedswarrow</code>		<code>\nneswarrow</code>		<code>\nsquigarrowdownup</code>
	<code>\ndasheduparrow</code>		<code>\nneswarrows</code>		<code>\nsquigarrowleftright</code>
	<code>\ndownarrow</code>		<code>\nNwarrow</code>		<code>\nsquigarrownesw</code>
	<code>\nDownarrow</code>		<code>\nnwarrow</code>		<code>\nsquigarrownwse</code>
	<code>\ndownarrowtail</code>		<code>\nnwarrowtail</code>		<code>\nsquigarrowrightleft</code>
	<code>\ndowndownarrows</code>		<code>\nnwlsquigarrow</code>		<code>\nsquigarrowsenw</code>
	<code>\ndownlsquigarrow</code>		<code>\nnwmapsto</code>		<code>\nsquigarrowswne</code>
	<code>\ndownmapsto</code>		<code>\nnwnwarrows</code>		<code>\nsquigarrowupdown</code>
	<code>\ndownrsquigarrow</code>		<code>\nnwrsquigarrow</code>		<code>\nswarrow</code>
	<code>\ndownuparrows</code>		<code>\nnwsearrow</code>		<code>\nSwarrow</code>
	<code>\nlcirclearrowdown</code>		<code>\nNwsearrow</code>		<code>\nswarrowtail</code>
	<code>\nlcirclearrowleft</code>		<code>\nnwsearrows</code>		<code>\nswlsquigarrow</code>
	<code>\nlcirclearrowright</code>		<code>\nrcirclearrowdown</code>		<code>\nswmapsto</code>
	<code>\nlcirclearrowup</code>		<code>\nrcirclearrowleft</code>		<code>\nswnearrows</code>
	<code>\nlcurvearrowdown</code>		<code>\nrcirclearrowright</code>		<code>\nswrsquigarrow</code>
	<code>\nlcurvearrowleft</code>		<code>\nrcirclearrowup</code>		<code>\nswswarrows</code>
	<code>\nlcurvearrowne</code>		<code>\nrcurvearrowdown</code>		<code>\ntwoheaddownarrow</code>
	<code>\nlcurvearrownw</code>		<code>\nrcurvearrowleft</code>		<code>\ntwoheadleftarrow</code>
	<code>\nlcurvearrowright</code>		<code>\nrcurvearrowne</code>		<code>\ntwoheadnearrow</code>
	<code>\nlcurvearrowse</code>		<code>\nrcurvearrownw</code>		<code>\ntwoheadnwarrow</code>
	<code>\nlcurvearrowsw</code>		<code>\nrcurvearrowright</code>		<code>\ntwoheadrightarrow</code>
	<code>\nlcurvearrowup</code>		<code>\nrcurvearrowse</code>		<code>\ntwoheadsearrow</code>
	<code>\nLeftarrow</code>		<code>\nrcurvearrowsw</code>		<code>\ntwoheadswarrow</code>
	<code>\nleftarrow</code>		<code>\nrcurvearrowup</code>		<code>\ntwoheaduparrow</code>

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$\leftarrowtail$	<code>\leftarrowtail</code>	$\downarrowhook$	<code>\nrhookdownarrow</code>	$\uparrow$	<code>\nuparrow</code>
$\leftrightarrow$	<code>\leftleftarrows</code>	$\leftarrowhook$	<code>\nrhookleftarrow</code>	$\Uparrow$	<code>\nUparrow</code>
$\leftleftarrow$	<code>\leftleftsquigarrow</code>	$\nearrow$	<code>\nrhooknearrow</code>	$\uparrowtail$	<code>\nuparrowtail</code>
$\mapsto$	<code>\leftmapsto</code>	$\rightsquigarrow$	<code>\nrhooknwarrow</code>	$\Downarrow$	<code>\nupdownarrow</code>
$\rightleftarrows$	<code>\leftrightarrow</code>	$\rightarrowhook$	<code>\nrhookrightarrow</code>	$\Updownarrow$	<code>\nUpdownarrow</code>
$\Leftrightarrow$	<code>\Leftrightarrow</code>	$\searrow$	<code>\nrhooksearrow</code>	$\Downarrow$	<code>\nupdownarrows</code>
$\rightleftarrows$	<code>\leftrightarrows</code>	$\swarrow$	<code>\nrhookswarrow</code>	$\updownarrow$	<code>\nuplsquigarrow</code>
$\rightsquigarrow$	<code>\leftrsquigarrow</code>	$\uparrowhook$	<code>\nrhookuparrow</code>	$\mapsto$	<code>\nupmapsto</code>
$\hookrightarrow$	<code>\nlhookdownarrow</code>	$\rightarrow$	<code>\nrightarrow</code>	$\rightsquigarrow$	<code>\nuprsquigarrow</code>
$\hookleftarrow$	<code>\nlhookleftarrow</code>	$\rightarrow$	<code>\nrightarrow</code>	$\Uparrow$	<code>\nupuparrows</code>
$\hooknearrow$	<code>\nlhooknearrow</code>	$\rightarrowtail$	<code>\nrightarrowtail</code>		

MnSymbol additionally defines synonyms for some of the preceding symbols:

$\circlearrowleft$	<code>\ncirclearrowleft</code>	(same as <code>\nrcirclearrowup</code> )
$\circlearrowright$	<code>\ncirclearrowright</code>	(same as <code>\nlcirclearrowup</code> )
$\curvearrowleft$	<code>\ncurvearrowleft</code>	(same as <code>\nrcurvearrowleft</code> )
$\curvearrowright$	<code>\ncurvearrowright</code>	(same as <code>\nlcurvearrowright</code> )
$\dashrightarrow$	<code>\ndasharrow</code>	(same as <code>\ndashedrightarrow</code> )
$\dashleftarrow$	<code>\ndashleftarrow</code>	(same as <code>\ndashedleftarrow</code> )
$\dashrightarrow$	<code>\ndashrightarrow</code>	(same as <code>\ndashedrightarrow</code> )
$\leftarrow$	<code>\ngets</code>	(same as <code>\leftarrow</code> )
$\leftarrowhook$	<code>\nhookleftarrow</code>	(same as <code>\nrhookleftarrow</code> )
$\rightarrowhook$	<code>\nhookrightarrow</code>	(same as <code>\nlhookrightarrow</code> )
$\rightarrow$	<code>\nleadsto</code>	(same as <code>\nrighttsquigarrow</code> )
$\rightleftarrows$	<code>\leftrightsquigarrow</code>	(same as <code>\nsquigarrowleftright</code> )
$\mapsto$	<code>\nmapsto</code>	(same as <code>\nrightmapsto</code> )
$\rightsquigarrow$	<code>\nrighthsquigarrow</code>	(same as <code>\nrighttsquigarrow</code> )
$\rightarrow$	<code>\nto</code>	(same as <code>\rightarrow</code> )

TABLE 166: MnSymbol Harpoons

$\downharpoonccw^*$	<code>\downharpoonccw^*</code>	$\swarrow$	<code>\neswharpoons</code>	$\searrow$	<code>\seharpooncw</code>
$\downharpooncw^*$	<code>\downharpooncw^*</code>	$\swarrow$	<code>\neswharpoonsenw</code>	$\searrow$	<code>\senwharpoons</code>
$\downharpoonup$	<code>\downupharpoons</code>	$\swarrow$	<code>\nwharpoonccw</code>	$\swarrow$	<code>\swharpoonccw</code>
$\lefttharpoonccw^*$	<code>\lefttharpoonccw^*</code>	$\swarrow$	<code>\nwharpooncw</code>	$\swarrow$	<code>\swharpooncw</code>
$\lefttharpooncw^*$	<code>\lefttharpooncw^*</code>	$\swarrow$	<code>\nwseharpoonnesw</code>	$\swarrow$	<code>\swneharpoons</code>
$\lefttharpoondownup$	<code>\lefttharpoondownup</code>	$\swarrow$	<code>\nwseharpoons</code>	$\updownharpoonleftright$	<code>\updownharpoonleftright</code>
$\lefttharpoons$	<code>\lefttharpoons</code>	$\swarrow$	<code>\nwseharpoonswne</code>	$\updownharpoonrightleft$	<code>\updownharpoonrightleft</code>
$\lefttharpoonupdown$	<code>\lefttharpoonupdown</code>	$\rightarrow$	<code>\rightharpoonccw^*</code>	$\updownharpoons$	<code>\updownharpoons</code>
$\nearrow$	<code>\neharpoonccw</code>	$\rightarrow$	<code>\rightharpooncw^*</code>	$\upharpoonccw^*$	<code>\upharpoonccw^*</code>
$\nearrow$	<code>\neharpooncw</code>	$\rightarrow$	<code>\rightleftharpoons</code>	$\upharpooncw^*$	<code>\upharpooncw^*</code>
$\nearrow$	<code>\neswharpoonnwse</code>	$\searrow$	<code>\seharpoonccw</code>		

\* Where marked, the “ccw” suffix can be replaced with “up” and the “cw” suffix can be replaced with “down”. (In addition, `\upharpooncw` can be written as `\restriction`.)

TABLE 167: MnSymbol Negated Harpoons

$\dagger$	<code>\ndownharpoonccw*</code>	$\nrightarrow$	<code>\nneswharpoons</code>	$\nwarrow$	<code>\nseharpooncw</code>
$\dagger$	<code>\ndownharpooncw*</code>	$\nrightarrow$	<code>\nneswharpoonsenw</code>	$\nwarrow$	<code>\nsenwharpoons</code>
$\ddagger$	<code>\ndownupharpoons</code>	$\nrightarrow$	<code>\nnwharpoonccw</code>	$\nwarrow$	<code>\nswharpoonccw</code>
$\nrightarrow$	<code>\nleftharpoonccw*</code>	$\nrightarrow$	<code>\nnwharpooncw</code>	$\nwarrow$	<code>\nswharpooncw</code>
$\nrightarrow$	<code>\nleftharpooncw*</code>	$\nrightarrow$	<code>\nnwseharpoonsesw</code>	$\nwarrow$	<code>\nswneharpoons</code>
$\nrightarrow$	<code>\nleftrightharpoondownup</code>	$\nrightarrow$	<code>\nnwseharpoons</code>	$\nrightarrow$	<code>\nupdownharpoonleftright</code>
$\nrightarrow$	<code>\nleftrightharpoons</code>	$\nrightarrow$	<code>\nnwseharpoonswne</code>	$\nrightarrow$	<code>\nupdownharpoonrightleft</code>
$\nrightarrow$	<code>\nleftrightharpoonupdown</code>	$\nrightarrow$	<code>\nrightharpoonccw*</code>	$\nrightarrow$	<code>\nupdownharpoons</code>
$\nrightarrow$	<code>\nneharpoonccw</code>	$\nrightarrow$	<code>\nrightharpooncw*</code>	$\nrightarrow$	<code>\nupharpoonccw*</code>
$\nrightarrow$	<code>\nneharpooncw</code>	$\nrightarrow$	<code>\nrightharpoons</code>	$\nrightarrow$	<code>\nupharpooncw*</code>
$\nrightarrow$	<code>\nneswharpoonnwse</code>	$\nrightarrow$	<code>\nseharpoonccw</code>		

\* Where marked, the “ccw” suffix can be replaced with “up” and the “cw” suffix can be replaced with “down”. (In addition, `\nupharpooncw` can be written as `\nrestriction`.)

TABLE 168: fdsymbol Arrows

$\curvearrowright$	<code>\acwcirculararrowdown</code>	$\leftarrow$	<code>\leftarrow</code>	$\Rightarrow$	<code>\rightrightarrows</code>
$\curvearrowleft$	<code>\acwcirculararrowleft</code>	$\leftarrow$	<code>\leftarrowtail</code>	$\rightsquigarrow$	<code>\rightwvearrow</code>
$\curvearrowright$	<code>\acwcirculararrowright</code>	$\leftarrow$	<code>\leftbkarrow</code>	$\Rightarrow$	<code>\Rrightarrow</code>
$\curvearrowup$	<code>\acwcirculararrowup</code>	$\Leftarrow$	<code>\leftleftarrows</code>	$\rightarrow$	<code>\Rsh</code>
$\curvearrowleft$	<code>\acwleftarcarrow</code>	$\leftarrow$	<code>\leftmapsto</code>	$\searrow$	<code>\searrow</code>
$\curvearrowright$	<code>\acwnearcarrow</code>	$\Leftarrow$	<code>\Leftmapsto</code>	$\searrow$	<code>\searrow</code>
$\curvearrowleft$	<code>\acwnwarcarrow</code>	$\Leftrightarrow$	<code>\Leftrightarrow</code>	$\searrow$	<code>\searrowtail</code>
$\curvearrowright$	<code>\acwoverarcarrow</code>	$\leftrightarrow$	<code>\leftrightharrow</code>	$\searrow$	<code>\sebkarrow</code>
$\curvearrowleft$	<code>\acwrightarcarrow</code>	$\Leftrightarrow$	<code>\leftrightharrows</code>	$\searrow$	<code>\senwarrows</code>
$\curvearrowright$	<code>\acwsearcarrow</code>	$\rightsquigarrow$	<code>\leftrighthwvearrow</code>	$\searrow$	<code>\sesearrows</code>
$\curvearrowleft$	<code>\acwswarcarrow</code>	$\rightsquigarrow$	<code>\leftwvearrow</code>	$\searrow$	<code>\Swarrow</code>
$\curvearrowright$	<code>\acwunderarcarrow</code>	$\lightning$	<code>\lightning</code>	$\swarrow$	<code>\swarrow</code>
$\curvearrowleft$	<code>\bdleftarcarrow</code>	$\Leftarrow$	<code>\Lleftarrow</code>	$\swarrow$	<code>\swarrowtail</code>
$\curvearrowright$	<code>\bdnearcarrow</code>	$\Leftarrow$	<code>\Llongleftarrow</code>	$\swarrow$	<code>\swbkarrow</code>
$\curvearrowleft$	<code>\bdnwarcarrow</code>	$\leftarrow$	<code>\longleftarrow</code>	$\searrow$	<code>\swnearrows</code>
$\curvearrowright$	<code>\bdoverarcarrow</code>	$\leftrightarrow$	<code>\longleftrightharrow</code>	$\searrow$	<code>\swswarrows</code>
$\curvearrowleft$	<code>\bdrightarcarrow</code>	$\Leftrightarrow$	<code>\Llongleftrightharrow</code>	$\downarrow$	<code>\twoheaddownarrow</code>
$\curvearrowright$	<code>\bdsearcarrow</code>	$\rightsquigarrow$	<code>\longleftwvearrow</code>	$\leftarrow$	<code>\twoheadleftarrow</code>
$\curvearrowleft$	<code>\bdswarcarrow</code>	$\Leftarrow$	<code>\Longmapsfrom</code>	$\rightarrow$	<code>\twoheadnearrow</code>
$\curvearrowright$	<code>\bdunderarcarrow</code>	$\leftarrow$	<code>\longmapsfrom</code>	$\rightarrow$	<code>\twoheadnvarrow</code>
$\curvearrowdown$	<code>\cwcirculararrowdown</code>	$\Rightarrow$	<code>\Longmapsto</code>	$\rightarrow$	<code>\twoheadrightarrow</code>
$\curvearrowleft$	<code>\cwcirculararrowleft</code>	$\rightarrow$	<code>\longmapsto</code>	$\searrow$	<code>\twoheadsearrow</code>

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	<code>\cwcirculararrowright</code>	$\longrightarrow$	<code>\longrightarrow</code>		<code>\twoheadswarrow</code>
	<code>\cwcirculararrowup</code>	$\Longrightarrow$	<code>\Longrightarrow</code>		<code>\twoheaduparrow</code>
	<code>\cwleftarcarrow</code>		<code>\longrightarrowwavyarrow</code>		<code>\uparrow</code>
	<code>\cwnearcarrow</code>		<code>\looparrowleft</code>		<code>\Uparrow</code>
	<code>\cwnwarcarrow</code>		<code>\looparrowright</code>		<code>\uparrowtail</code>
	<code>\cwoverarcarrow</code>		<code>\Lsh</code>		<code>\upbararrow</code>
	<code>\cwrightarcarrow</code>		<code>\nearrow</code>		<code>\Updownarrow</code>
	<code>\cwsearcarrow</code>		<code>\Nearrow</code>		<code>\updownarrow</code>
	<code>\cswarcarrow</code>		<code>\nearrowtail</code>		<code>\updownarrows</code>
	<code>\cwunderarcarrow</code>		<code>\nekbarrow</code>		<code>\updownwavyarrow</code>
	<code>\Ddownarrow</code>		<code>\nenearrows</code>		<code>\upmapsto</code>
	<code>\Downarrow</code>		<code>\Neswarrow</code>		<code>\Upmapsto</code>
	<code>\downarrow</code>		<code>\neswarrow</code>		<code>\upuparrows</code>
	<code>\downarrowtail</code>		<code>\neswarrows</code>		<code>\upwavyarrow</code>
	<code>\downbbararrow</code>		<code>\Nwarrow</code>		<code>\Uparrow</code>
	<code>\downdownarrows</code>		<code>\narrow</code>		<code>\vardownwavyarrow</code>
	<code>\Downmapsto</code>		<code>\narrowtail</code>		<code>\varhookdownarrow</code>
	<code>\downmapsto</code>		<code>\nwbbarrow</code>		<code>\varhookleftarrow</code>
	<code>\downuparrows</code>		<code>\nwnwarrows</code>		<code>\varhooknearrow</code>
	<code>\downwavyarrow</code>		<code>\Nwsearrow</code>		<code>\varhooknward</code>
	<code>\hookdownarrow</code>		<code>\nwsearrow</code>		<code>\varhookrightarrow</code>
	<code>\hookleftarrow</code>		<code>\nwsearrows</code>		<code>\varhooksearrow</code>
	<code>\hooknearrow</code>		<code>\Rdsh</code>		<code>\varhookswarrow</code>
	<code>\hooknward</code>	$\Rightarrow$	<code>\Rightarrow</code>		<code>\varhookuparrow</code>
	<code>\hookrightarrow</code>	$\rightarrow$	<code>\rightarrow</code>		<code>\varleftrightwavyarrow</code>
	<code>\hooksearrow</code>	$\rightarrow$	<code>\rightarrowtail</code>		<code>\varleftwavyarrow</code>
	<code>\hookswarrow</code>	$\rightarrow$	<code>\rightarrowtail</code>		<code>\varrightwavyarrow</code>
	<code>\hookuparrow</code>	$\Leftrightarrow$	<code>\rightleftarrows</code>		<code>\varupdownwavyarrow</code>
	<code>\Ldsh</code>	$\Rightarrow$	<code>\Rightmapsto</code>		<code>\varupwavyarrow</code>
	<code>\Leftarrow</code>	$\mapsto$	<code>\rightmapsto</code>		

fdsymbol defines synonyms for most of the preceding symbols:

	<code>\acwgapcirculararrow</code>		<code>\leftrightsquigarrow</code>		<code>\rhooknward</code>
	<code>\acwopencirculararrow</code>		<code>\leftsquigarrow</code>		<code>\rhookrightarrow</code>
	<code>\circlearrowleft</code>		<code>\leftsquigarrow</code>		<code>\rhooksearrow</code>
	<code>\circlearrowright</code>		<code>\leftupcurvedarrow</code>		<code>\rhookswarrow</code>
	<code>\curvearrowleft</code>		<code>\hookdownarrow</code>		<code>\rhookuparrow</code>
	<code>\curvearrowright</code>		<code>\hookleftarrow</code>		<code>\rightcurvedarrow</code>
	<code>\cwgapcirculararrow</code>		<code>\hooknearrow</code>		<code>\rightdowncurvedarrow</code>
	<code>\cwopencirculararrow</code>		<code>\hooknward</code>		<code>\rightlcurvearrow</code>
$\dashrightarrow$	<code>\dashrightarrow</code>		<code>\hookrightarrow</code>		<code>\rightleftcurvearrow</code>
$\dashleftarrow$	<code>\dashleftarrow</code>		<code>\hooksearrow</code>		<code>\rightleftsquigarrow</code>
$\dashrightarrow$	<code>\dashrightarrow</code>		<code>\hookswarrow</code>		<code>\rightlsquigarrow</code>
	<code>\downlcurvearrow</code>		<code>\hookuparrow</code>		<code>\rightrcurvearrow</code>
	<code>\downleftcurvedarrow</code>		<code>\longleadsto</code>		<code>\rightrsquigarrow</code>

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$\Downarrow$	<code>\downlsquigarrow</code>	$\rightsquigarrow$	<code>\longleftsquigarrow</code>	$\rightsquigarrow$	<code>\rightsquigarrow</code>
$\curvearrowright$	<code>\downrcurvearrow</code>	$\rightsquigarrow$	<code>\longrightsquigarrow</code>	$\curvearrowright$	<code>\rightupcurvedarrow</code>
$\curvearrowright$	<code>\downrightcurvedarrow</code>	$\Downarrow$	<code>\mapsdown</code>	$\curvearrowright$	<code>\selcurvearrow</code>
$\Downarrow$	<code>\downrsquigarrow</code>	$\Downarrow$	<code>\Mapsdown</code>	$\curvearrowleft$	<code>\senwcurvearrow</code>
$\curvearrowleft$	<code>\downupcurvearrow</code>	$\leftarrow$	<code>\mapsfrom</code>	$\curvearrowleft$	<code>\sercurvearrow</code>
$\Downarrow$	<code>\downupsquigarrow</code>	$\Leftarrow$	<code>\Mapsfrom</code>	$\curvearrowleft$	<code>\swlcurvearrow</code>
$\Downarrow$	<code>\downzigzagarrow</code>	$\mapsto$	<code>\mapsto</code>	$\curvearrowleft$	<code>\swnecurvearrow</code>
$\leftarrow$	<code>\gets</code>	$\mapsto$	<code>\Mapsto</code>	$\curvearrowleft$	<code>\swrcurvearrow</code>
$\curvearrowright$	<code>\hknearrow</code>	$\Uparrow$	<code>\mapsup</code>	$\rightarrow$	<code>\to</code>
$\curvearrowright$	<code>\hknwarrow</code>	$\Uparrow$	<code>\Mapsup</code>	$\curvearrowright$	<code>\updowncurvearrow</code>
$\curvearrowleft$	<code>\hksearrow</code>	$\curvearrowright$	<code>\nelcurvearrow</code>	$\Downarrow$	<code>\updownsquigarrow</code>
$\curvearrowleft$	<code>\hkswarrow</code>	$\curvearrowright$	<code>\nercurvearrow</code>	$\curvearrowright$	<code>\uplcurvearrow</code>
$\curvearrowright$	<code>\leadsto</code>	$\curvearrowleft$	<code>\neswcurvearrow</code>	$\curvearrowleft$	<code>\upleftcurvedarrow</code>
$\curvearrowleft$	<code>\leftcurvedarrow</code>	$\curvearrowleft$	<code>\nwlcurvearrow</code>	$\curvearrowright$	<code>\uplsquigarrow</code>
$\curvearrowleft$	<code>\leftdowncurvedarrow</code>	$\curvearrowleft$	<code>\nwrcurvearrow</code>	$\curvearrowright$	<code>\uprcurvearrow</code>
$\curvearrowleft$	<code>\leftlcurvearrow</code>	$\curvearrowleft$	<code>\nwsecurvearrow</code>	$\curvearrowright$	<code>\uprightcurvearrow</code>
$\curvearrowleft$	<code>\leftlsquigarrow</code>	$\Downarrow$	<code>\rhookdownarrow</code>	$\curvearrowright$	<code>\uprsquigarrow</code>
$\curvearrowright$	<code>\leftrcurvearrow</code>	$\leftarrow$	<code>\rhookleftarrow</code>		
$\curvearrowright$	<code>\leftrightcurvearrow</code>	$\curvearrowright$	<code>\rhooknearrow</code>		

TABLE 169: fdsymbol Negated Arrows

$\nrightarrow$	<code>\nacwcirclearrowdown</code>	$\nleftarrow$	<code>\nleftarrow</code>	$\nrightarrow$	<code>\nRrightarrow</code>
$\nrightarrow$	<code>\nacwcirclearrowleft</code>	$\nleftarrow$	<code>\nLeftarrow</code>	$\nrightarrow$	<code>\nsearrow</code>
$\nrightarrow$	<code>\nacwcirclearrowright</code>	$\nleftarrow$	<code>\nleftarrowtail</code>	$\nrightarrow$	<code>\nSearrow</code>
$\nrightarrow$	<code>\nacwcirclearrowup</code>	$\nleftarrow$	<code>\nleftbkarrow</code>	$\nrightarrow$	<code>\nsearrowtail</code>
$\nrightarrow$	<code>\nacwleftarcarrow</code>	$\nleftarrow$	<code>\nleftleftarrows</code>	$\nrightarrow$	<code>\nsebkarrow</code>
$\nrightarrow$	<code>\nacwnearcarrow</code>	$\nleftarrow$	<code>\nleftmapsto</code>	$\nrightarrow$	<code>\nsewarrows</code>
$\nrightarrow$	<code>\nacwnwarcarrow</code>	$\nleftarrow$	<code>\nLeftmapsto</code>	$\nrightarrow$	<code>\nsesearrows</code>
$\nrightarrow$	<code>\nacwoverarcarrow</code>	$\nleftarrow$	<code>\nleftrightarrow</code>	$\nrightarrow$	<code>\nswarrow</code>
$\nrightarrow$	<code>\nacwrightarcarrow</code>	$\nleftarrow$	<code>\nLeftrightarrow</code>	$\nrightarrow$	<code>\nSwarrow</code>
$\nrightarrow$	<code>\nacwsearcarrow</code>	$\nleftarrow$	<code>\nleftrightarrows</code>	$\nrightarrow$	<code>\nswarrowtail</code>
$\nrightarrow$	<code>\nacwswarcarrow</code>	$\nleftarrow$	<code>\nleftrightwavearrow</code>	$\nrightarrow$	<code>\nswbkarrow</code>
$\nrightarrow$	<code>\nacwunderarcarrow</code>	$\nleftarrow$	<code>\nleftwavearrow</code>	$\nrightarrow$	<code>\nswnearrows</code>
$\nrightarrow$	<code>\nbdleftarcarrow</code>	$\nleftarrow$	<code>\nLleftarrow</code>	$\nrightarrow$	<code>\nswswarrows</code>
$\nrightarrow$	<code>\nbdnearcarrow</code>	$\nleftarrow$	<code>\nlongleftarrow</code>	$\nrightarrow$	<code>\ntwoheaddownarrow</code>
$\nrightarrow$	<code>\nbdnwarcarrow</code>	$\nleftarrow$	<code>\nLongleftarrow</code>	$\nrightarrow$	<code>\ntwoheadleftarrow</code>
$\nrightarrow$	<code>\nbdoverarcarrow</code>	$\nleftarrow$	<code>\nlongleftrightarrow</code>	$\nrightarrow$	<code>\ntwoheadnearrow</code>
$\nrightarrow$	<code>\nbdrightarcarrow</code>	$\nleftarrow$	<code>\nLongleftrightarrow</code>	$\nrightarrow$	<code>\ntwoheadnwarrow</code>

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	<code>\nbdsearrow</code>		<code>\nlongleftwv</code>		<code>\ntwoheadrt</code>
	<code>\nbdswarrow</code>		<code>\nlongmapsfrom</code>		<code>\ntwoheadsearrow</code>
	<code>\nbdunderarc</code>		<code>\nLongmapsfrom</code>		<code>\ntwoheadswarrow</code>
	<code>\ncwcirclearrowdown</code>		<code>\nlongmapsto</code>		<code>\ntwoheaduparrow</code>
	<code>\ncwcirclearrowleft</code>		<code>\nLongmapsto</code>		<code>\nuparrow</code>
	<code>\ncwcirclearrowright</code>		<code>\nlongrightarrow</code>		<code>\nUparrow</code>
	<code>\ncwcirclearrowup</code>		<code>\nLongrightarrow</code>		<code>\nuparrowtail</code>
	<code>\ncwleftarc</code>		<code>\nlongrightwv</code>		<code>\nupbkarrow</code>
	<code>\ncwnearc</code>		<code>\nnearrow</code>		<code>\nupdownarrow</code>
	<code>\ncwnwarc</code>		<code>\nNearrow</code>		<code>\nUpdownarrow</code>
	<code>\ncwoverarc</code>		<code>\nnearrowtail</code>		<code>\nupdownarrows</code>
	<code>\ncwrightarc</code>		<code>\nnebkarrow</code>		<code>\nupdownwv</code>
	<code>\ncwsearc</code>		<code>\nnenearrows</code>		<code>\nupmapsto</code>
	<code>\ncwswarc</code>		<code>\nneswarrow</code>		<code>\nUpmapsto</code>
	<code>\ncwunderarc</code>		<code>\nNeswarrow</code>		<code>\nupuparrows</code>
	<code>\nDdownarrow</code>		<code>\nneswarrows</code>		<code>\nupwv</code>
	<code>\ndownarrow</code>		<code>\nnwarrow</code>		<code>\nUparrow</code>
	<code>\nDownarrow</code>		<code>\nNwarrow</code>		<code>\nvardownwv</code>
	<code>\ndownarrowtail</code>		<code>\nnwarrowtail</code>		<code>\nvarhookdownarrow</code>
	<code>\ndownbkarrow</code>		<code>\nnwbkarrow</code>		<code>\nvarhookleftarrow</code>
	<code>\ndowndownarrows</code>		<code>\nnwnwarrows</code>		<code>\nvarhooknearrow</code>
	<code>\ndownmapsto</code>		<code>\nnwsearrow</code>		<code>\nvarhooknwarrow</code>
	<code>\nDownmapsto</code>		<code>\nNwsearrow</code>		<code>\nvarhookrightarrow</code>
	<code>\ndownuparrows</code>		<code>\nnwsearrows</code>		<code>\nvarhooksearrow</code>
	<code>\ndownwv</code>		<code>\nrightarrow</code>		<code>\nvarhookswarrow</code>
	<code>\nhookdownarrow</code>		<code>\nRightarrow</code>		<code>\nvarhookuparrow</code>
	<code>\nhookleftarrow</code>		<code>\nrightarrowtail</code>		<code>\nvarleftrighthwv</code>
	<code>\nhooknearrow</code>		<code>\nrightbkarrow</code>		<code>\nvarleftwv</code>
	<code>\nhooknwarrow</code>		<code>\nrightrightarrows</code>		<code>\nvarrightwv</code>
	<code>\nhookrightarrow</code>		<code>\nrightmapsto</code>		<code>\nvarupdownwv</code>
	<code>\nhooksearrow</code>		<code>\nRightmapsto</code>		<code>\nvarupwv</code>
	<code>\nhookswarrow</code>		<code>\nrightrightarrows</code>		
	<code>\nhookuparrow</code>		<code>\nrightwv</code>		

fdsymbol defines synonyms for most of the preceding symbols:

	<code>\nacwgapcirclearrow</code>		<code>\nleftdowncurvedarrow</code>		<code>\nrightcurvedarrow</code>
	<code>\nacwopencirclearrow</code>		<code>\nleftlcurvearrow</code>		<code>\nrightdowncurvedarrow</code>
	<code>\ncirclearrowleft</code>		<code>\nleftlsquigarrow</code>		<code>\nrightlcurvearrow</code>
	<code>\ncirclearrowright</code>		<code>\nleftrcurvearrow</code>		<code>\nrightleftcurvearrow</code>
	<code>\ncurvearrowleft</code>		<code>\nleftrightsquigarrow</code>		<code>\nrightleftsquigarrow</code>
	<code>\ncurvearrowright</code>		<code>\nleftrightsquigarrow</code>		<code>\nrightlsquigarrow</code>
	<code>\ncwgapcirclearrow</code>		<code>\nleftrsquigarrow</code>		<code>\nrightrcurvearrow</code>
	<code>\ncwopencirclearrow</code>		<code>\nleftsquigarrow</code>		<code>\nrightrsquigarrow</code>
	<code>\ndasharrow</code>		<code>\nleftupcurvedarrow</code>		<code>\nrightsquigarrow</code>

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$\dashleftarrow$	<code>\dashleftarrow</code>	$\leadsto$	<code>\longleadsto</code>	$\curvearrowright$	<code>\rightupcurvedarrow</code>
$\dashrightarrow$	<code>\dashrightarrow</code>	$\rightsquigarrow$	<code>\longleftsquigarrow</code>	$\curvearrowleft$	<code>\selcurvearrow</code>
$\downarrow$	<code>\downlcurvedarrow</code>	$\rightsquigarrow$	<code>\longrightsquigarrow</code>	$\curvearrowleft$	<code>\senwcurvedarrow</code>
$\curvearrowleft$	<code>\downleftcurvedarrow</code>	$\downdownarrows$	<code>\nmapsdown</code>	$\curvearrowright$	<code>\nsercurvearrow</code>
$\rightsquigarrow$	<code>\downlsquigarrow</code>	$\downdownarrows$	<code>\nMapsdown</code>	$\curvearrowleft$	<code>\nswlcurvedarrow</code>
$\curvearrowright$	<code>\downrcurvedarrow</code>	$\nrightarrow$	<code>\nmapsfrom</code>	$\curvearrowright$	<code>\nswnecurvedarrow</code>
$\rightsquigarrow$	<code>\downrightcurvedarrow</code>	$\nrightarrow$	<code>\nMapsfrom</code>	$\curvearrowright$	<code>\nswrcurvedarrow</code>
$\rightsquigarrow$	<code>\downrsquigarrow</code>	$\mapsto$	<code>\nmapsto</code>	$\rightarrow$	<code>\nto</code>
$\updownarrow$	<code>\downupcurvedarrow</code>	$\nrightarrow$	<code>\nMapsto</code>	$\updownarrow$	<code>\nupdowncurvedarrow</code>
$\rightsquigarrow$	<code>\downupsquigarrow</code>	$\updownarrow$	<code>\nmapsup</code>	$\updownarrow$	<code>\nupdownsquigarrow</code>
$\nrightarrow$	<code>\ngets</code>	$\updownarrow$	<code>\nMapsup</code>	$\upcurvedarrow$	<code>\nuplcurvedarrow</code>
$\nrightarrow$	<code>\nhknearrow</code>	$\curvearrowright$	<code>\nnelcurvearrow</code>	$\upcurvedarrow$	<code>\nupleftcurvedarrow</code>
$\nrightarrow$	<code>\nhknwarrow</code>	$\curvearrowleft$	<code>\nnercurvearrow</code>	$\rightsquigarrow$	<code>\nuplsquigarrow</code>
$\nrightarrow$	<code>\nhksearrow</code>	$\curvearrowright$	<code>\nneswcurvearrow</code>	$\upcurvedarrow$	<code>\nuprcurvedarrow</code>
$\nrightarrow$	<code>\nhkswarrow</code>	$\curvearrowleft$	<code>\nnwlcurvearrow</code>	$\rightsquigarrow$	<code>\nuprightcurvedarrow</code>
$\rightarrow$	<code>\nleadsto</code>	$\curvearrowleft$	<code>\nnwrcurvearrow</code>	$\rightsquigarrow$	<code>\nuprsquigarrow</code>
$\curvearrowleft$	<code>\nleftcurvedarrow</code>	$\curvearrowright$	<code>\nnwsecurvearrow</code>		

TABLE 170: fdsymbol Harpoons

$\downharpoonleft$	<code>\downharpoonleft</code>	$\nearrow$	<code>\neswharpoons</code>	$\searrow$	<code>\seharpoonsw</code>
$\downharpoonright$	<code>\downharpoonright</code>	$\nwarrow$	<code>\neswharpoonsenw</code>	$\searrow$	<code>\senwharpoons</code>
$\downupharpoons$	<code>\downupharpoons</code>	$\swarrow$	<code>\nwharpoonne</code>	$\swarrow$	<code>\swharpoonnw</code>
$\leftharpoondown$	<code>\leftharpoondown</code>	$\swarrow$	<code>\nwharpoonsw</code>	$\swarrow$	<code>\swharpoone</code>
$\leftharpoonup$	<code>\leftharpoonup</code>	$\nwarrow$	<code>\nwseharpoonsesw</code>	$\swarrow$	<code>\swneharpoons</code>
$\leftrightharpoondownup$	<code>\leftrightharpoondownup</code>	$\nwarrow$	<code>\nwseharpoons</code>	$\updownarrow$	<code>\updownharpoonleftright</code>
$\leftrightharpoons$	<code>\leftrightharpoons</code>	$\swarrow$	<code>\nwseharpoonswne</code>	$\downharpoonleft$	<code>\updownharpoonrightleft</code>
$\leftrightharpoonupdown$	<code>\leftrightharpoonupdown</code>	$\rightarrow$	<code>\rightharpoondown</code>	$\updownarrow$	<code>\updownharpoons</code>
$\neharpoonnw$	<code>\neharpoonnw</code>	$\rightarrow$	<code>\rightharpoonup</code>	$\upharpoonleft$	<code>\upharpoonleft</code>
$\neharpoone$	<code>\neharpoone</code>	$\rightleftharpoons$	<code>\rightleftharpoons</code>	$\upharpoonright$	<code>\upharpoonright</code>
$\neswharpoonnwse$	<code>\neswharpoonnwse</code>	$\searrow$	<code>\seharpoonne</code>		

fdsymbol defines `\restriction` as a synonym for `\upharpoonright`, `\updownharpoonsleftright` as a synonym for `\updownharpoons`, and `\downupharpoonsleftright` as a synonym for `\downupharpoons`.

TABLE 171: fdsymbol Negated Harpoons

†	<code>\downharpoonleft</code>	⌘	<code>\neswharpoons</code>	⌘	<code>\nseharpoonsw</code>
‡	<code>\downharpoonright</code>	⌘	<code>\neswharpoonsenw</code>	⌘	<code>\nsenwharpoons</code>
‡	<code>\downupharpoons</code>	⌘	<code>\nnwharpoonne</code>	⌘	<code>\nswharpoonnw</code>
⊣	<code>\leftharpoondown</code>	⌘	<code>\nnwharpoonsw</code>	⌘	<code>\nswharpoonse</code>
⊤	<code>\leftharpoonup</code>	⌘	<code>\nnwseharpoonsesw</code>	⌘	<code>\nswneharpoons</code>
⊥	<code>\leftrightharpoondownup</code>	⌘	<code>\nnwseharpoons</code>	‡	<code>\nupdownharpoonleftright</code>
⊦	<code>\leftrightharpoons</code>	⌘	<code>\nnwseharpoonswne</code>	‡	<code>\nupdownharpoonrightleft</code>
⊧	<code>\leftrightharpoonupdown</code>	⊣	<code>\nrightharpoondown</code>	‡	<code>\nupdownharpoons</code>
⌘	<code>\neharpoonnw</code>	⊤	<code>\nrightharpoonup</code>	‡	<code>\nupharpoonleft</code>
⌘	<code>\neharpoonse</code>	⊦	<code>\nrightharpoons</code>	‡	<code>\nupharpoonright</code>
⌘	<code>\neswharpoonnwse</code>	⌘	<code>\nseharpoonne</code>		

`fdsymbol` defines `\nrestriction` as a synonym for `\nupharpoonright`, `\ndownupharpoonsleftright` as a synonym for `\ndownupharpoons`, and `\nupdownharpoonsleftright` as a synonym for `\nupdownharpoons`.

TABLE 172: boisk Arrows

↔	<code>\barleftarrow</code>	↖	<code>\Lsh</code>
↔	<code>\barleftarrowrightarrowbar</code>	↓	<code>\mapsdown</code>
↖	<code>\barovernorthwestarrow</code>	↔	<code>\Mapsfrom</code>
↶	<code>\carriagereturn</code>	↔	<code>\mapsfrom</code>
↶	<code>\circlearrowleft</code>	⇒	<code>\Mapsto</code>
↷	<code>\circlearrowright</code>	⇒	<code>\mapsto</code>
↵	<code>\cupleftarrow</code>	↑	<code>\mapsup</code>
↵	<code>\curlyveedownarrow</code>	↗	<code>\Nearrow</code>
↶	<code>\curlyveeuparrow</code>	↘	<code>\nearrowcorner</code>
↷	<code>\curlywedgedownarrow</code>	↗	<code>\nnearrow</code>
↶	<code>\curlywedgeuparrow</code>	↖	<code>\nnwarrow</code>
↶	<code>\curvearrowbotleft</code>	↘	<code>\Nwarrow</code>
↷	<code>\curvearrowbotleftright</code>	↖	<code>\nwarrowcorner</code>
↷	<code>\curvearrowbotright</code>	→	<code>\rightarrowbar</code>
↶	<code>\curvearrowleft</code>	⊙	<code>\rightarrowcircle</code>
↷	<code>\curvearrowleftright</code>	→	<code>\rightarrowtail</code>
↶	<code>\curvearrowright</code>	→	<code>\rightarrowTriangle</code>
↶	<code>\dlsh</code>	→	<code>\rightarrowtriangle</code>
↓	<code>\downblackarrow</code>	→	<code>\rightblackarrow</code>
↓	<code>\downdasharrow</code>	→	<code>\rightdasharrow</code>
↓	<code>\downdownarrows</code>	↔	<code>\rightleftarrows</code>
↶	<code>\downtouparrow</code>	→	<code>\rightrightarrows</code>
↓	<code>\downwhitearrow</code>	↗	<code>\rightsquigarrow</code>

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$\downarrow$	<code>\downzigzagarrow</code>	$\Rightarrow$	<code>\rightthreearrows</code>
$\downarrow$	<code>\drsh</code>	$\curvearrowright$	<code>\righttleftarrow</code>
$\leftrightarrow$	<code>\eqleftrightharrow</code>	$\Rightarrow$	<code>\rightwhitearrow</code>
$\hookleftarrow$	<code>\hookleftarrow</code>	$\curvearrowright$	<code>\rightwhiteroundarrow</code>
$\hookrightarrow$	<code>\hookrightarrow</code>	$\Rightarrow$	<code>\Rrightarrow</code>
$\leftarrow$	<code>\leftarrowtail</code>	$\Rrightarrow$	<code>\Rsh</code>
$\leftarrow$	<code>\leftarrowTriangle</code>	$\searrow$	<code>\Searrow</code>
$\leftarrow$	<code>\leftarrowtriangle</code>	$\searrow$	<code>\ssearrow</code>
$\blackleftarrow$	<code>\leftblackarrow</code>	$\searrow$	<code>\sswarrow</code>
$\leftarrow$	<code>\leftdasharrow</code>	$\swarrow$	<code>\Swarrow</code>
$\leftleftarrows$	<code>\leftleftarrows</code>	$\Downarrow$	<code>\twoheaddownarrow</code>
$\leftrightarrows$	<code>\leftrightarrows</code>	$\Leftarrow$	<code>\twoheadleftarrow</code>
$\leftrightharrows$	<code>\leftrightharrows</code>	$\rightarrow$	<code>\twoheadrightarrow</code>
$\leftarrowtriangle$	<code>\leftarrowtriangle</code>	$\Uparrow$	<code>\twoheaduparrow</code>
$\blackleftarrowtriangle$	<code>\leftblackarrowtriangle</code>	$\Updownarrow$	<code>\twoheadwhiteuparrow</code>
$\leftrightsquigarrow$	<code>\leftrightsquigarrow</code>	$\Updownarrow$	<code>\twoheadwhiteuparrowpedestal</code>
$\leftsquigarrow$	<code>\leftsquigarrow</code>	$\Uparrow$	<code>\upblackarrow</code>
$\lefttorightarrow$	<code>\lefttorightarrow</code>	$\Uparrow$	<code>\updasharrow</code>
$\leftwhitearrow$	<code>\leftwhitearrow</code>	$\Updownarrow$	<code>\updownarrowbar</code>
$\leftwhiteroundarrow$	<code>\leftwhiteroundarrow</code>	$\Updownarrow$	<code>\updownblackarrow</code>
$\leftzigzagarrow$	<code>\leftzigzagarrow</code>	$\Downarrow$	<code>\updownwhitearrow</code>
$\linefeed$	<code>\linefeed</code>	$\Downarrow$	<code>\uptodownarrow</code>
$\Lleftarrow$	<code>\Lleftarrow</code>	$\Uparrow$	<code>\upuparrows</code>
$\looparrowdownleft$	<code>\looparrowdownleft</code>	$\Updownarrow$	<code>\upwhitearrow</code>
$\looparrowdownright$	<code>\looparrowdownright</code>	$\Updownarrow$	<code>\whitearrowupfrombar</code>
$\looparrowleft$	<code>\looparrowleft</code>	$\Updownarrow$	<code>\whitearrowuppedestal</code>
$\looparrowright$	<code>\looparrowright</code>	$\Updownarrow$	<code>\whitearrowuppedestalthbar</code>
		$\Updownarrow$	<code>\whitearrowuppedestallvbar</code>

Many of these symbols are defined only if the `arrows` package option is specified.

TABLE 173: `boisik` Negated Arrows

$\nHdownarrow$	<code>\nHdownarrow</code>	$\nLeftrightarrow$	<code>\nLeftrightarrow</code>	$\nRightarrow$	<code>\nRightarrow</code>
$\nHuparrow$	<code>\nHuparrow</code>	$\nleftrightharrow$	<code>\nleftrightharrow</code>	$\nVleftarrow$	<code>\nVleftarrow</code>
$\nLeftarrow$	<code>\nLeftarrow</code>	$\nLeftrightarrow$	<code>\nLeftrightarrow</code>	$\nVrightarrow$	<code>\nVrightarrow</code>
$\nleftarrow$	<code>\nleftarrow</code>	$\nrightarrow$	<code>\nrightarrow</code>		

Many of these symbols are defined only if the `arrows` package option is specified.

TABLE 174: boisk Harpoons

$\downarrow$	<code>\downharpoonleft</code>	$\Leftrightarrow$	<code>\leftrightharpoons</code>	$\uparrow$	<code>\upharpoonleft</code>
$\searrow$	<code>\downharpoonright</code>	$\rightarrow$	<code>\rightharpoondown</code>	$\uparrow$	<code>\upharpoonright</code>
$\leftarrow$	<code>\leftharpoondown</code>	$\rightarrow$	<code>\rightharpoonup</code>		
$\nwarrow$	<code>\leftharpoonup</code>	$\Leftrightarrow$	<code>\rightleftharpoons</code>		

TABLE 175: stix Arrows

$\circlearrowleft$	<code>\acwcirclearrow</code>	$\mapsto$	<code>\longmapsto</code>
$\circlearrowright$	<code>\acwgapcirclearrow</code>	$\Longmapsto$	<code>\Longmapsto</code>
$\curvearrowleft$	<code>\acwleftarcarrow</code>	$\rightarrow$	<code>\longrightarrow</code>
$\curvearrowright$	<code>\acwoverarcarrow</code>	$\Rightarrow$	<code>\Longrightarrow</code>
$\underarcleftarrow$	<code>\acwunderarcarrow</code>	$\rightsquigarrow$	<code>\longrightsquigarrow</code>
$\bar{\leftarrow}$	<code>\barleftarrow</code>	$\looparrowleft$	<code>\looparrowleft</code>
$\bar{\leftarrow}\bar{\rightarrow}$	<code>\barleftarrowrightarrowbar*</code>	$\looparrowright$	<code>\looparrowright</code>
$\bar{\rightarrow}$	<code>\barrightarrowdiamond</code>	$\Lsh$	<code>\Lsh</code>
$\bar{\uparrow}$	<code>\baruparrow</code>	$\mapsto$	<code>\mapsdown</code>
$\bsimilarrleftarrow$	<code>\bsimilarleftarrow</code>	$\Mapsfrom$	<code>\Mapsfrom</code>
$\bsimilarrrightarrow$	<code>\bsimilarrightarrow</code>	$\mapsto$	<code>\mapsfrom</code>
$\carriagereturn*$	<code>\carriagereturn*</code>	$\mapsto$	<code>\mapsto</code>
$\ccwundercurvearrow$	<code>\ccwundercurvearrow</code>	$\Mapsto$	<code>\Mapsto</code>
$\circlearrowleft$	<code>\circlearrowleft</code>	$\uparrow$	<code>\mapsup</code>
$\circlearrowright$	<code>\circlearrowright</code>	$\nearrow$	<code>\Nearrow</code>
$\circleonleftarrow$	<code>\circleonleftarrow</code>	$\nearrow$	<code>\nearrow</code>
$\circleonrightarrow$	<code>\circleonrightarrow</code>	$\nearrow$	<code>\neovnearrow*</code>
$\curvearrowleft$	<code>\curvearrowleft</code>	$\nearrow$	<code>\neovsearrow*</code>
$\curvearrowleftplus$	<code>\curvearrowleftplus</code>	$\nearrow$	<code>\neswarrow</code>
$\curvearrowright$	<code>\curvearrowright</code>	$\nearrow$	<code>\nwarrow</code>
$\curvearrowrightminus$	<code>\curvearrowrightminus</code>	$\nearrow$	<code>\Nwarrow</code>
$\cwcirclearrow$	<code>\cwcirclearrow</code>	$\nearrow$	<code>\nwovnearrow*</code>
$\cwgapcirclearrow$	<code>\cwgapcirclearrow</code>	$\nearrow$	<code>\nwsearrow</code>
$\cwrightarcarrow$	<code>\cwrightarcarrow</code>	$\nearrow$	<code>\rdiagovsearrow*</code>
$\cwundercurvearrow$	<code>\cwundercurvearrow</code>	$\searrow$	<code>\Rdsh</code>
$\dbkarow$	<code>\dbkarow</code>	$\Rightarrow$	<code>\Rightarrow</code>
$\Downarrow$	<code>\Downarrow</code>	$\rightarrow$	<code>\rightarrow</code>
$\Downarrow$	<code>\Downarrow</code>	$\rightarrow$	<code>\rightarrowapprox</code>
$\diamondleftarrow$	<code>\diamondleftarrow</code>	$\rightarrow$	<code>\rightarrowbackapprox</code>
$\diamondleftarrowbar$	<code>\diamondleftarrowbar</code>	$\rightarrow$	<code>\rightarrowbar</code>
$\downarrow$	<code>\downarrow</code>	$\rightarrow$	<code>\rightarrowbsimilar</code>
$\Downarrow$	<code>\Downarrow</code>	$\rightarrow$	<code>\rightarrowdiamond</code>
$\downarrowbar$	<code>\downarrowbar</code>	$\oplus$	<code>\rightarrowonoplus</code>

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$\bar{\downarrow}$	<code>\downarrowbarred</code>	$\rightarrow+$	<code>\rightarrowplus</code>
$\dashrightarrow$	<code>\downdasharrow*</code>	$\rightleftarrows$	<code>\rightarrowshortleftarrow</code>
$\Downarrow$	<code>\downdownarrows</code>	$\rightsquigarrow$	<code>\rightarrowsimilar</code>
$\curvearrowright$	<code>\downrightcurvedarrow*</code>	$\rightarrowtail$	<code>\rightarrowtail</code>
$\Uparrow$	<code>\downuparrows</code>	$\rightarrowtriangle$	<code>\rightarrowtriangle</code>
$\Downarrow$	<code>\downwhitearrow*</code>	$\rightarrowx$	<code>\rightarrowx</code>
$\zigzagarrow$	<code>\downzigzagarrow</code>	$\rightarrowbkarrow$	<code>\rightarrowbkarrow</code>
$\rightarrow$	<code>\draftingarrow*</code>	$\rightarrowcurvedarrow$	<code>\rightarrowcurvedarrow</code>
$\rightarrowrightarrow$	<code>\drbkarow</code>	$\rightarrowdasharrow*$	<code>\rightarrowdasharrow*</code>
$\leftarrow$	<code>\equalleftarrow</code>	$\rightarrowdotarrow$	<code>\rightarrowdotarrow</code>
$\Rightarrow$	<code>\equalrightarrow</code>	$\rightarrowcurvedarrow$	<code>\rightarrowdowncurvedarrow</code>
$\nearrow$	<code>\fdiagovnearrow*</code>	$\leftleftarrows$	<code>\leftleftarrows</code>
$\nearrow$	<code>\hknearrow</code>	$\rightarrowrightarrow$	<code>\rightarrowrightarrow</code>
$\nearrow$	<code>\hknwarrow</code>	$\rightsquigarrow$	<code>\rightsquigarrow</code>
$\nearrow$	<code>\hksearrow</code>	$\rightarrowrightarrow$	<code>\rightarrowthreearrows</code>
$\nearrow$	<code>\hkswarrow</code>	$\rightarrow$	<code>\rightarrowwavearrow</code>
$\hookrightarrow$	<code>\hookleftarrow</code>	$\rightarrowwhitearrow*$	<code>\rightarrowwhitearrow*</code>
$\hookrightarrow$	<code>\hookrightarrow</code>	$\Rrightarrow$	<code>\Rrightarrow</code>
$\Ldash$	<code>\Ldash</code>	$\Rrightarrow$	<code>\Rrightarrow</code>
$\leftarrow$	<code>\leftarrow</code>	$\Rsh$	<code>\Rsh</code>
$\Leftarrow$	<code>\Leftarrow</code>	$\searrow$	<code>\searrow</code>
$\leftarrowapprox$	<code>\leftarrowapprox</code>	$\searrow$	<code>\searrow</code>
$\leftarrowbackapprox$	<code>\leftarrowbackapprox</code>	$\seovnearrow*$	<code>\seovnearrow*</code>
$\leftarrowbsimilar$	<code>\leftarrowbsimilar</code>	$\shortrightarrowleftarrow$	<code>\shortrightarrowleftarrow</code>
$\leftarrowonoplus$	<code>\leftarrowonoplus</code>	$\simleftarrow$	<code>\simleftarrow</code>
$\leftarrowplus$	<code>\leftarrowplus</code>	$\simrightarrow$	<code>\simrightarrow</code>
$\leftarrowshortrightarrow$	<code>\leftarrowshortrightarrow</code>	$\swarrow$	<code>\swarrow</code>
$\leftarrowsimilar$	<code>\leftarrowsimilar</code>	$\swarrow$	<code>\swarrow</code>
$\leftarrowtail$	<code>\leftarrowtail</code>	$\toea$	<code>\toea</code>
$\leftarrowtriangle$	<code>\leftarrowtriangle</code>	$\tona$	<code>\tona</code>
$\leftarrowx$	<code>\leftarrowx</code>	$\tosa$	<code>\tosa</code>
$\leftarrowbkarrow$	<code>\leftarrowbkarrow</code>	$\towa$	<code>\towa</code>
$\leftarrowcurvedarrow$	<code>\leftarrowcurvedarrow</code>	$\twoheaddownarrow$	<code>\twoheaddownarrow</code>
$\leftarrowdasharrow*$	<code>\leftarrowdasharrow*</code>	$\twoheadleftarrow$	<code>\twoheadleftarrow</code>
$\leftarrowdbkarrow$	<code>\leftarrowdbkarrow</code>	$\twoheadleftarrowtail$	<code>\twoheadleftarrowtail</code>
$\leftarrowdotarrow$	<code>\leftarrowdotarrow</code>	$\twoheadleftdbkarrow$	<code>\twoheadleftdbkarrow</code>
$\leftarrowdowncurvedarrow$	<code>\leftarrowdowncurvedarrow</code>	$\twoheadmapsfrom$	<code>\twoheadmapsfrom</code>
$\leftleftarrows$	<code>\leftleftarrows</code>	$\twoheadmapsto$	<code>\twoheadmapsto</code>
$\Leftrightarrow$	<code>\Leftrightarrow</code>	$\twoheadrightarrow$	<code>\twoheadrightarrow</code>
$\leftrightarrow$	<code>\leftrightarrow</code>	$\twoheadrightarrowtail$	<code>\twoheadrightarrowtail</code>
$\leftrightarrowcircle$	<code>\leftrightarrowcircle</code>	$\twoheaduparrow$	<code>\twoheaduparrow</code>
$\leftrightarrows$	<code>\leftrightarrows</code>	$\twoheaduparrowcircle$	<code>\twoheaduparrowcircle</code>
$\leftrightarrowtriangle$	<code>\leftrightarrowtriangle</code>	$\uparrow$	<code>\uparrow</code>
$\leftrightsquigarrow$	<code>\leftrightsquigarrow</code>	$\Uparrow$	<code>\Uparrow</code>
$\leftsquigarrow$	<code>\leftsquigarrow</code>	$\uparrowbarred$	<code>\uparrowbarred</code>
$\leftthreearrows$	<code>\leftthreearrows</code>	$\updasharrow*$	<code>\updasharrow*</code>

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$\curvearrowleft$	<code>\leftwvearrow</code>	$\Updownarrow$	<code>\Updownarrow</code>
$\Lleftarrow$	<code>\leftwhitearrow*</code>	$\updownarrow$	<code>\updownarrow</code>
$\lfloor$	<code>\linefeed*</code>	$\bar{\updownarrow}$	<code>\updownarrowbar*</code>
$\Lleftarrow$	<code>\Lleftarrow</code>	$\updownarrows$	<code>\updownarrows</code>
$\Lleftarrow$	<code>\Lleftarrow</code>	$\upcurvearrowright$	<code>\uprightcurvearrow*</code>
$\longleftarrow$	<code>\longleftarrow</code>	$\upuparrows$	<code>\upuparrows</code>
$\Longleftarrow$	<code>\Longleftarrow</code>	$\upwhitearrow$	<code>\upwhitearrow*</code>
$\longleftrightarrow$	<code>\Longlefttrightarrow</code>	$\Uparrow$	<code>\Uparrow</code>
$\longleftrightarrow$	<code>\longleftrightarrow</code>	$\Uparrow$	<code>\Uparrow</code>
$\rightsquigarrow$	<code>\longleftsquigarrow</code>	$\varcarriagereturn*$	<code>\varcarriagereturn*</code>
$\longmapsto$	<code>\Longmapsfrom</code>	$\whitearrowupfrombar*$	<code>\whitearrowupfrombar*</code>
$\longmapsto$	<code>\longmapsfrom</code>		

\* Defined as an ordinary character, not as a binary relation.

stix defines `\acwopencirclearrow` as a synonym for `\circlearrowleft`, `\cwopencirclearrow` as a synonym for `\circlearrowright`, `\leadsto` as a synonym for `\rightsquigarrow`, `\dashleftarrow` as a synonym for `\leftdbkarrow`, and `\dashrightarrow` and `\dasharrow` as synonyms for `\dbkarrow`.

TABLE 176: stix Negated Arrows

$\nHdownarrow$ *	<code>\nHdownarrow*</code>	$\nvLeftrightarrow$	<code>\nvLeftrightarrow</code>
$\nHuparrow$ *	<code>\nHuparrow*</code>	$\nVrightarrow$	<code>\nVrightarrow</code>
$\nleftarrow$ <sup>†</sup>	<code>\nleftarrow</code> <sup>†</sup>	$\nvrightarrow$	<code>\nvrightarrow</code>
$\nleftarrow$	<code>\nleftarrow</code>	$\nrightarrow$	<code>\nrightarrow</code>
$\nleftrightarrow$	<code>\nleftrightarrow</code>	$\nrightarrowtail$	<code>\nrightarrowtail</code>
$\nleftrightarrow$	<code>\nleftrightarrow</code>	$\nrightarrowtail$	<code>\nrightarrowtail</code>
$\nrightarrow$	<code>\nrightarrow</code>	$\nvtwoheadleftarrow$	<code>\nvtwoheadleftarrow</code>
$\nrightarrow$	<code>\nrightarrow</code>	$\nvtwoheadleftarrow$	<code>\nvtwoheadleftarrow</code>
$\nleftarrow$	<code>\nleftarrow</code>	$\nvtwoheadleftarrowtail$	<code>\nvtwoheadleftarrowtail</code>
$\nleftarrow$	<code>\nleftarrow</code>	$\nvtwoheadleftarrowtail$	<code>\nvtwoheadleftarrowtail</code>
$\nVleftarrow$	<code>\nVleftarrow</code>	$\nvtwoheadrightarrow$	<code>\nvtwoheadrightarrow</code>
$\nVleftarrowtail$	<code>\nVleftarrowtail</code>	$\nvtwoheadrightarrow$	<code>\nvtwoheadrightarrow</code>
$\nVleftarrowtail$	<code>\nVleftarrowtail</code>	$\nvtwoheadrightarrowtail$	<code>\nvtwoheadrightarrowtail</code>
$\nVleftarrowtail$	<code>\nVleftarrowtail</code>	$\nvtwoheadrightarrowtail$	<code>\nvtwoheadrightarrowtail</code>
$\nVleftarrow$	<code>\nVleftarrow</code>		

\* Defined as an ordinary character, not as a binary relation.

<sup>†</sup> stix defines `\ngets` as a synonym for `\nleftarrow`.

TABLE 177: stix Harpoons

$\bar{\downarrow}$	<code>\bardownharpoonleft</code>	$\Leftrightarrow$	<code>\leftrightharpoons</code>
$\bar{\uparrow}$	<code>\bardownharpoonright</code>	$\Leftrightarrow$	<code>\leftrightharpoonsdown</code>
$\bar{\leftarrow}$	<code>\barleftharpoonupdown</code>	$\Leftrightarrow$	<code>\leftrightharpoonsup</code>
$\bar{\leftarrow}$	<code>\barleftharpoonup</code>	$\leftrightarrow$	<code>\leftrightharpoonupdown</code>
$\bar{\rightarrow}$	<code>\barrightharpoonupdown</code>	$\leftrightarrow$	<code>\leftrightharpoonupup</code>
$\bar{\rightarrow}$	<code>\barrightharpoonup</code>	$\rightarrow$	<code>\rightharpoonupdown</code>
$\bar{\uparrow}$	<code>\barupharpoonleft</code>	$\rightarrow$	<code>\rightharpoonupdownbar</code>
$\bar{\uparrow}$	<code>\barupharpoonright</code>	$\Rightarrow$	<code>\rightharpoonsupdown</code>
$\dashleftarrow$	<code>\dashleftharpoonupdown</code>	$\rightarrow$	<code>\rightharpoonupup</code>
$\dashrightarrow$	<code>\dashrightharpoonupdown</code>	$\rightarrow$	<code>\rightharpoonupupbar</code>
$\downarrow$	<code>\downharpoonleft</code>	$\Rightarrow$	<code>\rightharpoonupupdash</code>
$\downarrow$	<code>\downharpoonleftbar</code>	$\Rightarrow$	<code>\rightleftharpoons</code>
$\downarrow$	<code>\downharpoonright</code>	$\Rightarrow$	<code>\rightleftharpoonsdown</code>
$\downarrow$	<code>\downharpoonrightbar</code>	$\Rightarrow$	<code>\rightleftharpoonsup</code>
$\Downarrow$	<code>\downharpoonsleftright</code>	$\Downarrow$	<code>\updownharpoonleftleft</code>
$\Updownarrow$	<code>\downupharpoonsleftright</code>	$\Downarrow$	<code>\updownharpoonleftright</code>
$\leftarrow$	<code>\leftharpoonupdown</code>	$\Downarrow$	<code>\updownharpoonrightleft</code>
$\leftarrow$	<code>\leftharpoonupdownbar</code>	$\Downarrow$	<code>\updownharpoonrightright</code>
$\Leftrightarrow$	<code>\leftharpoonsupdown</code>	$\Downarrow$	<code>\updownharpoonsleftright</code>
$\leftarrow$	<code>\leftharpoonup</code>	$\uparrow$	<code>\upharpoonleft</code>
$\leftarrow$	<code>\leftharpoonupbar</code>	$\uparrow$	<code>\upharpoonleftbar</code>
$\dashleftarrow$	<code>\leftharpoonupdash</code>	$\uparrow$	<code>\upharpoonright*</code>
$\rightarrow$	<code>\leftrightharpoonupdowndown</code>	$\uparrow$	<code>\upharpoonrightbar</code>
$\rightarrow$	<code>\leftrightharpoonupdownup</code>	$\Uparrow$	<code>\upharpoonsleftright</code>

\* stix defines `\restriction` as a synonym for `\upharpoonright`.

TABLE 178: pdfMsym Arrows

$\lightning$	<code>\lightning</code>		
$\Leftrightarrow$	<code>\longvarCircleleftarrow</code>	$\Leftrightarrow$	<code>\varCircleleftarrow</code>
$\Leftrightarrow$	<code>\longvarcircleleftarrow</code>	$\Leftrightarrow$	<code>\varcircleleftarrow</code>
$\Leftrightarrow$	<code>\longvarCirclerightarrow</code>	$\Leftrightarrow$	<code>\varCirclerightarrow</code>
$\Leftrightarrow$	<code>\longvarcircclerightarrow</code>	$\Leftrightarrow$	<code>\varcircclerightarrow</code>
$\Leftrightarrow$	<code>\longvardoubleleftarrow</code>	$\Leftrightarrow$	<code>\vardoubleleftarrow</code>
$\Leftrightarrow$	<code>\longvardoublerightarrow</code>	$\Leftrightarrow$	<code>\vardoublerightarrow</code>
$\Leftrightarrow$	<code>\longvardownhookleftarrow</code>	$\Leftrightarrow$	<code>\vardownhookleftarrow</code>

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$\longrightarrow$	<code>\longvardownhookrightarrow</code>	$\rightarrow$	<code>\vardownhookrightarrow</code>
$\longleftarrow$	<code>\longvarLeftarrow</code>	$\leftarrow$	<code>\varLeftarrow</code>
$\longleftarrow$	<code>\longvarleftarrow</code>	$\leftarrow$	<code>\varleftarrow</code>
$\longleftrightarrow$	<code>\longvarleftarrows</code>	$\longleftrightarrow$	<code>\varleftarrows</code>
$\longleftrightarrow$	<code>\longvarleftrightharpoonrightarrow</code>	$\longleftrightarrow$	<code>\varleftrightharpoonrightarrow</code>
$\longleftrightarrow$	<code>\longvarleftrightharpoons</code>	$\longleftrightarrow$	<code>\varleftrightharpoons</code>
$\longleftrightarrow$	<code>\longvarLleftarrow</code>	$\longleftrightarrow$	<code>\varLleftarrow</code>
$\longleftrightarrow$	<code>\longvarLleftRrightarrow</code>	$\longleftrightarrow$	<code>\varLleftRrightarrow</code>
$\longleftarrow$	<code>\longvarmapsfrom</code>	$\longleftarrow$	<code>\varmapsfrom</code>
$\longrightarrow$	<code>\longvarmapsto</code>	$\longrightarrow$	<code>\varmapsto</code>
$\longleftrightarrow$	<code>\longvarRibbonleftarrow</code>	$\longleftrightarrow$	<code>\varRibbonleftarrow</code>
$\longleftrightarrow$	<code>\longvarRibbonrightarrow</code>	$\longleftrightarrow$	<code>\varRibbonrightarrow</code>
$\Longrightarrow$	<code>\longvarRightarrow</code>	$\Longrightarrow$	<code>\varRightarrow</code>
$\longrightarrow$	<code>\longvarrightarrow</code>	$\longrightarrow$	<code>\varrightarrow</code>
$\Longrightarrow$	<code>\longvarrightarrowarrows</code>	$\Longrightarrow$	<code>\varrightarrowarrows</code>
$\longleftrightarrow$	<code>\longvarrightarrowleftarrows</code>	$\longleftrightarrow$	<code>\varrightarrowleftarrows</code>
$\Longrightarrow$	<code>\longvarRrightarrow</code>	$\Longrightarrow$	<code>\varRrightarrow</code>
$\longleftrightarrow$	<code>\longvarSquareleftarrow</code>	$\longleftrightarrow$	<code>\varSquareleftarrow</code>
$\Longrightarrow$	<code>\longvarSquarerightarrow</code>	$\Longrightarrow$	<code>\varSquarerightarrow</code>
$\longleftarrow$	<code>\longvaruphookleftarrow</code>	$\longleftarrow$	<code>\varuphookleftarrow</code>
$\longrightarrow$	<code>\longvaruphookrightarrow</code>	$\longrightarrow$	<code>\varuphookrightarrow</code>

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

TABLE 179: pdfMsym Harpoons

$\longleftarrow$	<code>\longvarleftharp</code>	$\leftarrow$	<code>\varleftharp</code>
$\longleftrightarrow$	<code>\longvarleftrightharp</code>	$\longleftrightarrow$	<code>\varleftrightharp</code>
$\longrightarrow$	<code>\longvarrightharp</code>	$\rightarrow$	<code>\varrightharp</code>
$\longleftrightarrow$	<code>\longvarrightharpleftharp</code>	$\longleftrightarrow$	<code>\varrightharpleftharp</code>

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

TABLE 180: chemarrow Arrows

$\rightarrow$  `\chemarrow`

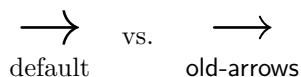
TABLE 181: fge Arrows

$\rightleftarrows$  `\fgerightarrow`      $\uparrow$  `\fgeuparrow`

TABLE 182: old-arrows Arrows

$\downarrow$	<code>\downarrow</code>	$\longleftrightarrow$	<code>\longlefttrightarrow</code>	$\nwarrow$	<code>\nwarrow</code>
$\hookleftarrow$	<code>\hookleftarrow</code>	$\longleftarrow$	<code>\longmapsfrom*</code>	$\rightarrow$	<code>\rightarrow</code>
$\hookrightarrow$	<code>\hookrightarrow</code>	$\mapsto$	<code>\longmapsto</code>	$\searrow$	<code>\searrow</code>
$\leftarrow$	<code>\leftarrow</code>	$\longrightarrow$	<code>\longrightarrow</code>	$\swarrow$	<code>\swarrow</code>
$\leftrightarrow$	<code>\leftrightarrow</code>	$\mapsto$	<code>\mapsfrom*</code>	$\uparrow$	<code>\uparrow</code>
$\longhookrightarrow$	<code>\longhookrightarrow</code>	$\mapsto$	<code>\mapsto</code>	$\updownarrow$	<code>\updownarrow</code>
$\longleftarrow$	<code>\longleftarrow</code>	$\nearrow$	<code>\nearrow</code>		

The arrows provided by `old-arrows` represent Donald Knuth’s pre-1992 Computer Modern glyphs, which feature smaller arrowheads. Contrast the following:



In addition to the arrows shown above, `old-arrows` also reduces the arrowhead size for  $\mathcal{AMS}$ ’s `\overleftarrow`, `\overrightarrow`, `\overleftrightarrow`, `\underleftarrow`, `\underrightarrow`, `\underleftrightarrow`, `\xleftarrow`, `\xrightarrow`, `\varinjlim`, and `\varprojlim` symbols (Table 204 on page 119, Table 270 on page 139, and Table 288 on page 145) and `mathtools`’s `\xleftrightarrow`, `\xhookleftarrow`, `\xhookrightarrow`, and `\xmapsto` symbols (Table 289 on page 145).

With the new package option, `old-arrows` prefixes all of the above with “`var`” (i.e., `\vardownarrow`, `\varhookleftarrow`, etc.) so both old and new glyphs can be used in the same document. See the `old-arrows` documentation for more information.

\* Requires `stmaryrd`.

TABLE 183: old-arrows Harpoons

$\longleftarrow\downarrow$	<code>\longlefttharpoondown</code>	$\longrightarrow\downarrow$	<code>\longrightharpoondown</code>
$\longleftarrow\uparrow$	<code>\longlefttharpoonup</code>	$\longrightarrow\uparrow$	<code>\longrightharpoonup</code>

Unlike the symbols shown in Table 182, the new package option does not define a `\var...` version of the symbols in this table. Also unlike the symbols shown in Table 182, the harpoon arrowheads in this table are not reduced in size (i.e., relative to the size of those shown in Table 154 on page 94).

TABLE 184: logix Arrows

$\dashleftarrow$	<code>\DashArrowLeft</code>	$\implies$	<code>\LMtImpl</code>	$\leftrightarrow$	<code>\RplcFree</code>
$\dashrightarrow$	<code>\DashArrowRight</code>	$\looparrowleft$	<code>\LoopArrowLeft</code>	$\leftarrow$	<code>\RplcFreeLeft</code>
$\rightarrow$	<code>\Entail</code>	$\looparrowright$	<code>\LoopArrowRight</code>	$\rightarrow$	<code>\RplcFreeRight</code>
$\leftrightarrow$	<code>\EntailEquv</code>	$\mapsto$	<code>\LParFunc</code>	$\rightarrow$	<code>\SEntail</code>
$\longleftrightarrow$	<code>\Equv</code>	$\rightarrow$	<code>\LWkEntail</code>	$\leftrightarrow$	<code>\SEntailEquv</code>
$\fisharrowleft$	<code>\FishArrowLeft</code>	$\longleftrightarrow$	<code>\LWkEntailEquv</code>	$\leftrightarrow$	<code>\SEquv</code>
$\fisharrowright$	<code>\FishArrowRight</code>	$\xrightarrow{+}$	<code>\MapParInGndMul</code>	$\rightarrow$	<code>\SFunc</code>
$\flatarrowleft$	<code>\FlatArrowLeft</code>	$\xrightarrow{+}$	<code>\MapParInGndOne</code>	$\downarrow$	<code>\ShftAccent</code>
$\flatarrowright$	<code>\FlatArrowRight</code>	$\xrightarrow{+}$	<code>\MapParInGndSng</code>	$\downarrow$	<code>\ShftSubscr</code>
$\forkarrowleft$	<code>\ForkArrowLeft</code>	$\xrightarrow{+}$	<code>\MapParInMul</code>	$\uparrow$	<code>\ShftSuper</code>
$\forkarrowright$	<code>\ForkArrowRight</code>	$\xrightarrow{+}$	<code>\MapParInOne</code>	$\rightarrow$	<code>\SImpl</code>
$\rightarrow$	<code>\Func</code>	$\xrightarrow{+}$	<code>\MapParInSng</code>	$\mapsto$	<code>\SMapTo</code>
$\xrightarrow{+}$	<code>\FunParInGndMul</code>	$\xrightarrow{+}$	<code>\MapParOnGndMul</code>	$\leftrightarrow$	<code>\SMtEquv</code>
$\xrightarrow{+}$	<code>\FunParInGndOne</code>	$\xrightarrow{+}$	<code>\MapParOnGndOne</code>	$\implies$	<code>\SMtImpl</code>
$\xrightarrow{+}$	<code>\FunParInGndSng</code>	$\xrightarrow{+}$	<code>\MapParOnGndSng</code>	$\mapsto$	<code>\SParFunc</code>
$\xrightarrow{+}$	<code>\FunParInMul</code>	$\xrightarrow{+}$	<code>\MapParOnMul</code>	$\rightarrow$	<code>\SWkEntail</code>
$\xrightarrow{+}$	<code>\FunParInOne</code>	$\xrightarrow{+}$	<code>\MapParOnOne</code>	$\leftrightarrow$	<code>\SWkEntailEquv</code>
$\xrightarrow{+}$	<code>\FunParInSng</code>	$\xrightarrow{+}$	<code>\MapParOnSng</code>	$\rightarrow$	<code>\VEntail</code>
$\xrightarrow{+}$	<code>\FunParOnGndMul</code>	$\mapsto$	<code>\MapTo</code>	$\leftrightarrow$	<code>\VEntailEquv</code>
$\xrightarrow{+}$	<code>\FunParOnGndOne</code>	$\xrightarrow{+}$	<code>\MapTotInGndMul</code>	$\leftrightarrow$	<code>\VEquv</code>
$\xrightarrow{+}$	<code>\FunParOnGndSng</code>	$\xrightarrow{+}$	<code>\MapTotInGndOne</code>	$\rightarrow$	<code>\VFunc</code>
$\xrightarrow{+}$	<code>\FunParOnMul</code>	$\xrightarrow{+}$	<code>\MapTotInGndSng</code>	$\rightarrow$	<code>\VImpl</code>
$\xrightarrow{+}$	<code>\FunParOnOne</code>	$\xrightarrow{+}$	<code>\MapTotInMul</code>	$\mapsto$	<code>\VMapTo</code>
$\xrightarrow{+}$	<code>\FunParOnSng</code>	$\xrightarrow{+}$	<code>\MapTotInOne</code>	$\leftrightarrow$	<code>\VMtEquv</code>
$\xrightarrow{+}$	<code>\FunTotInGndMul</code>	$\xrightarrow{+}$	<code>\MapTotInSng</code>	$\implies$	<code>\VMtImpl</code>
$\xrightarrow{+}$	<code>\FunTotInGndOne</code>	$\xrightarrow{+}$	<code>\MapTotOnGndMul</code>	$\mapsto$	<code>\VParFunc</code>
$\xrightarrow{+}$	<code>\FunTotInGndSng</code>	$\xrightarrow{+}$	<code>\MapTotOnGndOne</code>	$\rightarrow$	<code>\VWkEntail</code>
$\xrightarrow{+}$	<code>\FunTotInMul</code>	$\xrightarrow{+}$	<code>\MapTotOnGndSng</code>	$\leftrightarrow$	<code>\VWkEntailEquv</code>
$\xrightarrow{+}$	<code>\FunTotInOne</code>	$\xrightarrow{+}$	<code>\MapTotOnMul</code>	$\curvearrowleft$	<code>\WavyArrowLeft</code>
$\xrightarrow{+}$	<code>\FunTotInSng</code>	$\xrightarrow{+}$	<code>\MapTotOnOne</code>	$\curvearrowright$	<code>\WavyArrowRight</code>
$\xrightarrow{+}$	<code>\FunTotOnGndMul</code>	$\xrightarrow{+}$	<code>\MapTotOnSng</code>	$\rightarrow$	<code>\WkEntail</code>
$\xrightarrow{+}$	<code>\FunTotOnGndOne</code>	$\leftrightarrow$	<code>\MtEquv</code>	$\leftrightarrow$	<code>\WkEntailEquv</code>
$\xrightarrow{+}$	<code>\FunTotOnGndSng</code>	$\implies$	<code>\MtImpl</code>	$\rightarrow$	<code>\XEntail</code>
$\xrightarrow{+}$	<code>\FunTotOnMul</code>	$\mapsto$	<code>\ParFunc</code>	$\leftrightarrow$	<code>\XEntailEquv</code>
$\xrightarrow{+}$	<code>\FunTotOnOne</code>	$\leftrightarrow$	<code>\RplcAll</code>	$\leftrightarrow$	<code>\XEquv</code>
$\xrightarrow{+}$	<code>\FunTotOnSng</code>	$\leftrightarrow$	<code>\RplcAllBnd</code>	$\rightarrow$	<code>\XFunc</code>
$\hookleftarrow$	<code>\HookArrowLeft</code>	$\leftarrow$	<code>\RplcAllBndLeft</code>	$\rightarrow$	<code>\XImpl</code>
$\hookrightarrow$	<code>\HookArrowRight</code>	$\rightarrow$	<code>\RplcAllBndRight</code>	$\mapsto$	<code>\XMapTo</code>
$\rightarrow$	<code>\Impl</code>	$\leftarrow$	<code>\RplcAllLeft</code>	$\leftrightarrow$	<code>\XMtEquv</code>
$\rightarrow$	<code>\LEntail</code>	$\rightarrow$	<code>\RplcAllRight</code>	$\implies$	<code>\XMtImpl</code>
$\leftrightarrow$	<code>\LEntailEquv</code>	$\leftrightarrow$	<code>\RplcAny</code>	$\mapsto$	<code>\XParFunc</code>
$\longleftrightarrow$	<code>\LEquv</code>	$\leftarrow$	<code>\RplcAnyLeft</code>	$\rightarrow$	<code>\XWkEntail</code>
$\rightarrow$	<code>\LFunc</code>	$\rightarrow$	<code>\RplcAnyRight</code>	$\leftrightarrow$	<code>\XWkEntailEquv</code>

(continued on next page)

(continued from previous page)

$\rightarrow$	<code>\LImpl</code>	$\leftrightarrow$	<code>\RplcEqv</code>	$\leftarrow$	<code>\ZigArrowLeft</code>
$\mapsto$	<code>\LMapTo</code>	$\leftarrow$	<code>\RplcEqvLeft</code>	$\rightarrow$	<code>\ZigArrowRight</code>
$\Leftrightarrow$	<code>\LMtEqv</code>	$\rightarrow$	<code>\RplcEqvRight</code>		

logix requires either Lua $\LaTeX$  or Xe $\LaTeX$ .

TABLE 185: logix Negated Arrows

$\nrightarrow$	<code>\NotEntail</code>	$\nrightarrow$	<code>\NotSEntail</code>	$\nrightarrow$	<code>\NotVWkEntail</code>
$\nleftrightarrow$	<code>\NotEntailEqv</code>	$\nleftrightarrow$	<code>\NotSEntailEqv</code>	$\nleftrightarrow$	<code>\NotVWkEntailEqv</code>
$\nleftrightarrow$	<code>\NotEqv</code>	$\nleftrightarrow$	<code>\NotSEqv</code>	$\nrightarrow$	<code>\NotWkEntail</code>
$\nrightarrow$	<code>\NotImpl</code>	$\nrightarrow$	<code>\NotSImpl</code>	$\nleftrightarrow$	<code>\NotWkEntailEqv</code>
$\nrightarrow$	<code>\NotLEntail</code>	$\nleftrightarrow$	<code>\NotSMtEqv</code>	$\nrightarrow$	<code>\NotXEntail</code>
$\nleftrightarrow$	<code>\NotLEntailEqv</code>	$\nrightarrow$	<code>\NotSMtImpl</code>	$\nleftrightarrow$	<code>\NotXEntailEqv</code>
$\nleftrightarrow$	<code>\NotLEqv</code>	$\nrightarrow$	<code>\NotSWkEntail</code>	$\nleftrightarrow$	<code>\NotXEqv</code>
$\nrightarrow$	<code>\NotLImpl</code>	$\nleftrightarrow$	<code>\NotSWkEntailEqv</code>	$\nrightarrow$	<code>\NotXImpl</code>
$\nleftrightarrow$	<code>\NotLMtEqv</code>	$\nrightarrow$	<code>\NotVEntail</code>	$\nleftrightarrow$	<code>\NotXMtEqv</code>
$\nrightarrow$	<code>\NotLMtImpl</code>	$\nleftrightarrow$	<code>\NotVEntailEqv</code>	$\nrightarrow$	<code>\NotXMtImpl</code>
$\nrightarrow$	<code>\NotLWkEntail</code>	$\nleftrightarrow$	<code>\NotVEqv</code>	$\nrightarrow$	<code>\NotXWkEntail</code>
$\nleftrightarrow$	<code>\NotLWkEntailEqv</code>	$\nrightarrow$	<code>\NotVImpl</code>	$\nleftrightarrow$	<code>\NotXWkEntailEqv</code>
$\nleftrightarrow$	<code>\NotMtEqv</code>	$\nleftrightarrow$	<code>\NotVMtEqv</code>		
$\nrightarrow$	<code>\NotMtImpl</code>	$\nrightarrow$	<code>\NotVMtImpl</code>		

logix requires either Lua $\LaTeX$  or Xe $\LaTeX$ .

TABLE 186: logix Harpoons

$\leftarrow$	<code>\HarpoonDnLeft</code>	$\leftarrow$	<code>\HarpoonUpLeft</code>
$\rightarrow$	<code>\HarpoonDnRight</code>	$\rightarrow$	<code>\HarpoonUpRight</code>

logix requires either Lua $\LaTeX$  or Xe $\LaTeX$ .

TABLE 187: logix Implications and Equivalences

$\varepsilon\rightarrow$	<code>\InEqv</code>	$\varepsilon\rightarrow$	<code>\SInEqv</code>	$\longleftrightarrow$	<code>\VWkEqv</code>	$\varepsilon\rightarrow$	<code>\XInEqv</code>
$\rightarrow$	<code>\InImpl</code>	$\rightarrow$	<code>\SInImpl</code>	$\rightarrow$	<code>\VWkImpl</code>	$\rightarrow$	<code>\XInImpl</code>
$\varepsilon\rightarrow$	<code>\LInEqv</code>	$\leftrightarrow$	<code>\SWkEqv</code>	$\longleftrightarrow$	<code>\VWkMtEqv</code>	$\leftrightarrow$	<code>\XWkEqv</code>
$\rightarrow$	<code>\LInImpl</code>	$\rightarrow$	<code>\SWkImpl</code>	$\implies$	<code>\VWkMtImpl</code>	$\rightarrow$	<code>\XWkImpl</code>
$\leftrightarrow$	<code>\LWkEqv</code>	$\leftrightarrow$	<code>\SWkMtEqv</code>	$\leftrightarrow$	<code>\WkEqv</code>	$\leftrightarrow$	<code>\XWkMtEqv</code>
$\rightarrow$	<code>\LWkImpl</code>	$\Rightarrow$	<code>\SWkMtImpl</code>	$\rightarrow$	<code>\WkImpl</code>	$\Rightarrow$	<code>\XWkMtImpl</code>
$\longleftrightarrow$	<code>\LWkMtEqv</code>	$\varepsilon\rightarrow$	<code>\VInEqv</code>	$\leftrightarrow$	<code>\WkMtEqv</code>		
$\Rightarrow$	<code>\LWkMtImpl</code>	$\rightarrow$	<code>\VInImpl</code>	$\Rightarrow$	<code>\WkMtImpl</code>		

logix requires either Lua $\LaTeX$  or Xe $\LaTeX$ .

TABLE 188: logix Negated Implications and Equivalences

$\nexists$	<code>\NotInEqv</code>	$\nLeftrightarrow$	<code>\NotSWkEqv</code>	$\nleftrightarrow$	<code>\NotWkEqv</code>
$\nrightarrow$	<code>\NotInImpl</code>	$\nRightarrow$	<code>\NotSWkImpl</code>	$\nrightarrow$	<code>\NotWkImpl</code>
$\nexists$	<code>\NotLinEqv</code>	$\nLeftrightarrow$	<code>\NotSWkMtEqv</code>	$\nleftrightarrow$	<code>\NotWkMtEqv</code>
$\nrightarrow$	<code>\NotLinImpl</code>	$\nRightarrow$	<code>\NotSWkMtImpl</code>	$\nrightarrow$	<code>\NotWkMtImpl</code>
$\nleftrightarrow$	<code>\NotLWkEqv</code>	$\nleftrightarrow$	<code>\NotVInEqv</code>	$\nleftrightarrow$	<code>\NotXInEqv</code>
$\nrightarrow$	<code>\NotLWkImpl</code>	$\nrightarrow$	<code>\NotVInImpl</code>	$\nrightarrow$	<code>\NotXInImpl</code>
$\nLeftrightarrow$	<code>\NotLWkMtEqv</code>	$\nleftrightarrow$	<code>\NotVWkEqv</code>	$\nleftrightarrow$	<code>\NotXWkEqv</code>
$\nRightarrow$	<code>\NotLWkMtImpl</code>	$\nrightarrow$	<code>\NotVWkImpl</code>	$\nrightarrow$	<code>\NotXWkImpl</code>
$\exists$	<code>\NotSInEqv</code>	$\Leftrightarrow$	<code>\NotVWkMtEqv</code>	$\Leftrightarrow$	<code>\NotXWkMtEqv</code>
$\rightarrow$	<code>\NotSInImpl</code>	$\Rightarrow$	<code>\NotVWkMtImpl</code>	$\Rightarrow$	<code>\NotXWkMtImpl</code>

logix requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 189: esrelation Restrictions

$\downarrow$	<code>\restrictbarb</code>	$\downarrow$	<code>\restrictmallet</code>	$\downarrow$	<code>\restrictwand</code>
$\uparrow$	<code>\restrictbarbup</code>	$\uparrow$	<code>\restrictmalletup</code>	$\uparrow$	<code>\restrictwandup</code>

TABLE 190: MnSymbol Spoons

$\downarrow$	<code>\downfilledspoon</code>	$\circ$	<code>\nespoon</code>	$\nwarrow$	<code>\nwfilledspoon</code>
$\downarrow$	<code>\downspoon</code>	$\nwarrow$	<code>\nnwfilledspoon</code>	$\nwarrow$	<code>\nwspoon</code>
$\leftarrow$	<code>\leftfilledspoon</code>	$\nwarrow$	<code>\nnwspoon</code>	$\rightarrow$	<code>\rightfilledspoon</code>
$\leftarrow$	<code>\leftspoon</code>	$\rightarrow$	<code>\nrightfilledspoon</code>	$\rightarrow$	<code>\rightspoon*</code>
$\downarrow$	<code>\ndownfilledspoon</code>	$\rightarrow$	<code>\nrightspoon*</code>	$\searrow$	<code>\seffilledspoon</code>
$\downarrow$	<code>\ndownspoon</code>	$\searrow$	<code>\nseffilledspoon</code>	$\searrow$	<code>\sespoon</code>
$\nearrow$	<code>\neffilledspoon</code>	$\searrow$	<code>\nsespoon</code>	$\swarrow$	<code>\swffilledspoon</code>
$\nearrow$	<code>\nespoon</code>	$\swarrow$	<code>\nswffilledspoon</code>	$\swarrow$	<code>\swspoon</code>
$\leftarrow$	<code>\nleftfilledspoon</code>	$\swarrow$	<code>\nswspoon</code>	$\uparrow$	<code>\upffilledspoon</code>
$\leftarrow$	<code>\nleftspoon</code>	$\uparrow$	<code>\nupffilledspoon</code>	$\uparrow$	<code>\upspoon</code>
$\nearrow$	<code>\neffilledspoon</code>	$\uparrow$	<code>\nupspoon</code>		

\* MnSymbol defines `\multimap` as a synonym for `\rightspoon` and `\nmultimap` as a synonym for `\nrightspoon`.

TABLE 191: MnSymbol Pitchforks

$\Psi$	<code>\downpitchfork</code>	$\times$	<code>\nnwpitchfork</code>	$\Rightarrow$	<code>\rightpitchfork</code>
$\Leftarrow$	<code>\leftpitchfork</code>	$\neq$	<code>\nrighpitchfork</code>	$\searrow$	<code>\sepitchfork</code>
$\Downarrow$	<code>\ndownpitchfork</code>	$\searrow$	<code>\nsepitchfork</code>	$\swarrow$	<code>\swpitchfork</code>
$\nearrow$	<code>\nepitchfork</code>	$\times$	<code>\nswpitchfork</code>	$\uparrow$	<code>\uppitchfork</code>
$\Leftarrow$	<code>\nleftpitchfork</code>	$\uparrow$	<code>\nuppitchfork</code>		
$\nearrow$	<code>\nnepitchfork</code>	$\searrow$	<code>\nwpitchfork</code>		

\* MnSymbol defines `\pitchfork` as a synonym for `\uppitchfork` and `\npitchfork` as a synonym for `\nuppitchfork`.

TABLE 192: MnSymbol Smiles and Frowns

$\approx$	<code>\doublefrown</code>	$\neq$	<code>\nsmileeq</code>	$\Leftarrow$	<code>\smileeq</code>
$\approx$	<code>\doublefrowneq</code>	$\neq$	<code>\nsmileeqfrown</code>	$\Leftarrow$	<code>\smileeqfrown</code>
$\Leftarrow$	<code>\doublesmile</code>	$\neq$	<code>\nsmilefrown</code>	$\Leftarrow$	<code>\smilefrown</code>
$\Leftarrow$	<code>\doublesmileeq</code>	$\neq$	<code>\nsmilefrowneq</code>	$\Leftarrow$	<code>\smilefrowneq</code>
$\Leftarrow$	<code>\eqfrown</code>	$\neq$	<code>\nsqdoublefrown</code>	$\Leftarrow$	<code>\sqdoublefrown</code>
$\Leftarrow$	<code>\eqsmile</code>	$\neq$	<code>\nsqdoublefrowneq</code>	$\Leftarrow$	<code>\sqdoublefrowneq</code>
$\Leftarrow$	<code>\frown</code>	$\neq$	<code>\nsqdoublesmile</code>	$\Leftarrow$	<code>\sqdoublesmile</code>
$\Leftarrow$	<code>\frowneq</code>	$\neq$	<code>\nsqdoublesmileeq</code>	$\Leftarrow$	<code>\sqdoublesmileeq</code>
$\Leftarrow$	<code>\frowneqsmile</code>	$\neq$	<code>\nsqeqfrown</code>	$\Leftarrow$	<code>\sqeqfrown</code>
$\Leftarrow$	<code>\frownsmile</code>	$\neq$	<code>\nsqeqsmile</code>	$\Leftarrow$	<code>\sqeqsmile</code>
$\Leftarrow$	<code>\frownsmileeq</code>	$\neq$	<code>\nsqfrown</code>	$\Leftarrow$	<code>\sqfrown</code>
$\neq$	<code>\ndoublefrown</code>	$\neq$	<code>\nsqfrowneq</code>	$\Leftarrow$	<code>\sqfrowneq</code>
$\neq$	<code>\ndoublefrowneq</code>	$\neq$	<code>\nsqfrowneqsmile</code>	$\Leftarrow$	<code>\sqfrowneqsmile</code>
$\neq$	<code>\ndoublesmile</code>	$\neq$	<code>\nsqfrownsmile</code>	$\Leftarrow$	<code>\sqfrownsmile</code>
$\neq$	<code>\ndoublesmileeq</code>	$\neq$	<code>\nsqsmile</code>	$\Leftarrow$	<code>\sqsmile</code>
$\neq$	<code>\neqfrown</code>	$\neq$	<code>\nsqsmileeq</code>	$\Leftarrow$	<code>\sqsmileeq</code>
$\neq$	<code>\neqsmile</code>	$\neq$	<code>\nsqsmileeqfrown</code>	$\Leftarrow$	<code>\sqsmileeqfrown</code>
$\neq$	<code>\nfrown</code>	$\neq$	<code>\nsqsmilefrown</code>	$\Leftarrow$	<code>\sqsmilefrown</code>
$\neq$	<code>\nfrowneq</code>	$\neq$	<code>\nsqtriplefrown</code>	$\Leftarrow$	<code>\sqtriplefrown</code>
$\neq$	<code>\nfrowneqsmile</code>	$\neq$	<code>\nsqtriplesmile</code>	$\Leftarrow$	<code>\sqtriplesmile</code>
$\neq$	<code>\nfrownsmile</code>	$\neq$	<code>\ntriplefrown</code>	$\Leftarrow$	<code>\triplefrown</code>
$\neq$	<code>\nfrownsmileeq</code>	$\neq$	<code>\ntriplesmile</code>	$\Leftarrow$	<code>\triplesmile</code>
$\neq$	<code>\nsmile</code>	$\Leftarrow$	<code>\smile</code>		

\* MnSymbol defines `\smallsmile` as a synonym for `\smile`, `\smallfrown` as a synonym for `\frown`, `\asymp` as a synonym for `\smilefrown`, and `\nasymp` as a synonym for `\nsmilefrown`.

TABLE 193: fdsymbol Spoons

$\bullet\circ$	<code>\blackwhitespoon</code>	$\downarrow$	<code>\downblackspoon</code>	$\uparrow$	<code>\upblackspoon</code>
$\downarrow$	<code>\downblackspoon</code>	$\downarrow$	<code>\downspoon</code>	$\uparrow$	<code>\upspoon</code>
$\downarrow$	<code>\downspoon</code>	$\blackleft$	<code>\nleftblackspoon</code>	$\circ\blackleft$	<code>\nwhiteblackspoon</code>
$\blackleft$	<code>\leftblackspoon</code>	$\blackleft\blackright$	<code>\nleftrightblackspoon</code>	$\blackright$	<code>\rightblackspoon</code>
$\blackleft\blackright$	<code>\leftrightblackspoon</code>	$\circ\blackleft$	<code>\nleftrightspoon</code>	$\circ$	<code>\rightspoon</code>
$\circ\blackleft$	<code>\leftrightspoon</code>	$\blackleft$	<code>\nleftspoon</code>	$\uparrow$	<code>\upblackspoon</code>
$\circ$	<code>\leftspoon</code>	$\blackright$	<code>\nrightblackspoon</code>	$\uparrow$	<code>\upspoon</code>
$\circ\blackright$	<code>\nblackwhitespoon</code>	$\blackright$	<code>\nrightspoon</code>	$\circ\blackright$	<code>\whiteblackspoon</code>

fdsymbol defines synonyms for many of the preceding symbols:

$\uparrow$	<code>\circmid</code>	$\circ$	<code>\multimapinv</code>	$\blackright$	<code>\nmultimap</code>
$\circ\blackleft$	<code>\dualmap</code>	$\uparrow$	<code>\ncircmid</code>	$\blackleft$	<code>\nmultimapinv</code>
$\blackleft\blackright$	<code>\imageof</code>	$\circ\blackleft$	<code>\ndualmap</code>	$\blackleft\blackright$	<code>\norigof</code>
$\downarrow$	<code>\midcir</code>	$\blackleft\blackright$	<code>\nimageof</code>	$\blackleft\blackright$	<code>\origof</code>
$\circ$	<code>\multimap</code>	$\downarrow$	<code>\nmidcir</code>		

TABLE 194: fdsymbol Pitchforks

$\Psi$	<code>\downpitchfork</code>	$\blackleft$	<code>\nleftpitchfork</code>	$\blackright$	<code>\rightpitchfork</code>
$\blackleft$	<code>\leftpitchfork</code>	$\blackright$	<code>\nrightpitchfork</code>	$\uparrow$	<code>\uppitchfork</code>
$\Psi$	<code>\downpitchfork</code>	$\uparrow$	<code>\nuppitchfork</code>		

fdsymbol defines `\npitchfork` as a synonym for `\nuppitchfork` and `\pitchfork` as a synonym for `\uppitchfork`.

TABLE 195: fdsymbol Smiles and Frowns

$\frown$	<code>\frown</code>	$\frown\neq$	<code>\nfrowneq</code>	$\frown\smile$	<code>\nsmilefrown</code>
$\frown\neq$	<code>\frowneq</code>	$\frown\smile$	<code>\nfrownsmile</code>	$\smile$	<code>\smile</code>
$\frown\smile$	<code>\frownsmile</code>	$\smile$	<code>\nsmile</code>	$\smile\neq$	<code>\smileeq</code>
$\nfrown$	<code>\nfrown</code>	$\smile\neq$	<code>\nsmileeq</code>	$\smile\smile$	<code>\smilefrown</code>

fdsymbol defines `\arceq` as a synonym for `\frowneq`, `\asymp` as a synonym for `\smilefrown`, `\closure` as a synonym for `\frownsmile`, `\narceq` as a synonym for `\nfrowneq`, `\nasymp` as a synonym for `\nsmilefrown`, `\nclosure` as a synonym for `\nfrownsmile`, `\smallfrown` as a synonym for `\frown`, and `\smallsmile` as a synonym for `\smile`.

TABLE 196: halloweenmath Brooms and Pitchforks

$\blackleft$	<code>\hmleftpitchfork</code>	$\blackleft$	<code>\leftbroom</code>
$\blackright$	<code>\hmrightpitchfork</code>	$\blackright$	<code>\rightbroom</code>

TABLE 197: ulsy Contradiction Symbols

⚡ `\blitza` ⚡ `\blitzb` ⚡ `\blitzc` ⚡ `\blitzd` ⚡ `\blitze`

TABLE 198: Extension Characters

– `\relbar` = `\Relbar`

TABLE 199: stmaryrd Extension Characters

/ `\Arrownot` † `\Mapsfromchar` † `\Mapstochar`  
 / `\arrownot` † `\mapsfromchar`

TABLE 200: txfonts/pxfonts Extension Characters

‡ `\Mappedfromchar` # `\Mmappedfromchar` # `\Mmapstochar`  
 ‡ `\mappedfromchar` # `\mmappedfromchar` # `\mmapstochar`

TABLE 201: mathabx Extension Characters

‡ `\mapsfromchar` † `\mapstochar`  
 ‡ `\Mapsfromchar` † `\Mapstochar`

TABLE 202: stix Extension Characters

◁ `\lhook` – `\relbar` ≡ `\RRelbar`  
 † `\mapsfromchar` = `\Relbar` ≡ `\Rrelbar`  
 † `\mapstochar` ▷ `\rhook`

TABLE 203: Log-like Symbols

`\arccos` `\cos` `\csc` `\exp` `\ker` `\limsup` `\min` `\sinh`  
`\arcsin` `\cosh` `\deg` `\gcd` `\lg` `\ln` `\Pr` `\sup`  
`\arctan` `\cot` `\det` `\hom` `\lim` `\log` `\sec` `\tan`  
`\arg` `\coth` `\dim` `\inf` `\liminf` `\max` `\sin` `\tanh`

Calling the above “symbols” may be a bit misleading.<sup>3</sup> Each log-like symbol merely produces the eponymous textual equivalent, but with proper surrounding spacing. See Section 12.4 for more information about log-like symbols. As `\bmod` and `\pmod` arguably are not symbols we refer the reader to the Short Math Guide for L<sup>A</sup>T<sub>E</sub>X [Dow00] for samples.



TABLE 204:  $\mathcal{AMS}$  Log-like Symbols

<code>injlim</code>	<code>\injlim</code>	$\varinjlim$	<code>\varinjlim</code>	$\overline{\lim}$	<code>\varlimsup</code>
<code>projlim</code>	<code>\projlim</code>	$\varprojlim$	<code>\varprojlim</code>	$\varprojlim$	<code>\varprojlim</code>

Load the `amsmath` package to get these symbols. See Section 12.4 for some additional comments regarding log-like symbols. As `\mod` and `\pmod` arguably are not symbols we refer the reader to the Short Math Guide for  $\text{\LaTeX}$  [Dow00] for samples.

TABLE 205: `mismath` Log-like Symbols

<code>adj</code>	<code>\adj</code>	<code>Conv</code>	<code>\Conv</code>	<code>id</code>	<code>\id</code>	<code>sech</code>	<code>\sech</code>
<code>arccot</code>	<code>\arccot</code>	<code>Cov</code>	<code>\Cov</code>	<code>Id</code>	<code>\Id</code>	<code>sgn</code>	<code>\sgn</code>
<code>arcosh</code>	<code>\arcosh</code>	<code>cov</code>	<code>\cov</code>	<code>im</code>	<code>\im</code>	<code>span</code>	<code>\spa</code>
<code>arcoth</code>	<code>\arcoth</code>	<code>csch</code>	<code>\csch</code>	<code>Im</code>	<code>\Im*</code>	<code>tr</code>	<code>\tr</code>
<code>arsch</code>	<code>\arsch</code>	$\overrightarrow{\text{curl}}$	<code>\curl</code>	<code>lb</code>	<code>\lb</code>	<code>Var</code>	<code>\Var</code>
<code>arsech</code>	<code>\arsech</code>	<code>div</code>	<code>\divg</code>	<code>lcm</code>	<code>\lcm</code>	<code>Z</code>	<code>\Zu</code>
<code>arsinh</code>	<code>\arsinh</code>	<code>End</code>	<code>\End</code>	<code>rank</code>	<code>\rank</code>		
<code>artanh</code>	<code>\artanh</code>	<code>erf</code>	<code>\erf</code>	<code>Re</code>	<code>\Re*</code>		
<code>Aut</code>	<code>\Aut</code>	$\overrightarrow{\text{grad}}$	<code>\grad</code>	$\overrightarrow{\text{rot}}$	<code>\rot</code>		

\* `mismath` renames  $\text{\LaTeX}$ 's `\Re` and `\Im` (Table 223) to `\oldRe` and `\oldIm`.

TABLE 206: `mismath` Asymptotic Notation

<code>O</code>	<code>\bigo</code>	$\mathcal{O}$	<code>\bigO</code>	<code>o</code>	<code>\lito</code>
----------------	--------------------	---------------	--------------------	----------------	--------------------

TABLE 207:  $\text{\LaTeX}$ 2e Number Sets

$\mathbb{C}$	<code>\Complex</code>	$\mathbb{Z}$	<code>\Integer</code>	$\mathbb{N}$	<code>\Natural</code>	$\mathbb{Q}$	<code>\Rational</code>	$\mathbb{R}$	<code>\Real</code>
$\mathbb{C}$	<code>\COMPLEX</code>	$\mathbb{Z}$	<code>\INTEGER</code>	$\mathbb{N}$	<code>\NATURAL</code>	$\mathbb{Q}$	<code>\RATIONAL</code>	$\mathbb{R}$	<code>\REAL</code>

<sup>3</sup>Michael J. Downes prefers the more general term, “atomic math objects”.

TABLE 208: Greek Letters

$\alpha$	<code>\alpha</code>	$\theta$	<code>\theta</code>	$o$	<code>o</code>	$\tau$	<code>\tau</code>
$\beta$	<code>\beta</code>	$\vartheta$	<code>\vartheta</code>	$\pi$	<code>\pi</code>	$\upsilon$	<code>\upsilon</code>
$\gamma$	<code>\gamma</code>	$\iota$	<code>\iota</code>	$\varpi$	<code>\varpi</code>	$\phi$	<code>\phi</code>
$\delta$	<code>\delta</code>	$\kappa$	<code>\kappa</code>	$\rho$	<code>\rho</code>	$\varphi$	<code>\varphi</code>
$\epsilon$	<code>\epsilon</code>	$\lambda$	<code>\lambda</code>	$\varrho$	<code>\varrho</code>	$\chi$	<code>\chi</code>
$\varepsilon$	<code>\varepsilon</code>	$\mu$	<code>\mu</code>	$\sigma$	<code>\sigma</code>	$\psi$	<code>\psi</code>
$\zeta$	<code>\zeta</code>	$\nu$	<code>\nu</code>	$\varsigma$	<code>\varsigma</code>	$\omega$	<code>\omega</code>
$\eta$	<code>\eta</code>	$\xi$	<code>\xi</code>				
$\Gamma$	<code>\Gamma</code>	$\Lambda$	<code>\Lambda</code>	$\Sigma$	<code>\Sigma</code>	$\Psi$	<code>\Psi</code>
$\Delta$	<code>\Delta</code>	$\Xi$	<code>\Xi</code>	$\Upsilon$	<code>\Upsilon</code>	$\Omega$	<code>\Omega</code>
$\Theta$	<code>\Theta</code>	$\Pi$	<code>\Pi</code>	$\Phi$	<code>\Phi</code>		

The remaining Greek majuscules can be produced with ordinary Latin letters. The symbol “M”, for instance, is used for both an uppercase “m” and an uppercase “ $\mu$ ”. To make available commands for *all* of the Greek majuscules, either use the `mathspec` package, which requires `XYLATEX`, or copy `mathspec.sty`’s Greek-letter definitions to your document’s preamble:

```

\DeclareMathSymbol{\Alpha}{\mathalpha}{operators}{"41}
\DeclareMathSymbol{\Beta}{\mathalpha}{operators}{"42}
\DeclareMathSymbol{\Epsilon}{\mathalpha}{operators}{"45}
\DeclareMathSymbol{\Zeta}{\mathalpha}{operators}{"5A}
\DeclareMathSymbol{\Eta}{\mathalpha}{operators}{"48}
\DeclareMathSymbol{\Iota}{\mathalpha}{operators}{"49}
\DeclareMathSymbol{\Kappa}{\mathalpha}{operators}{"4B}
\DeclareMathSymbol{\Mu}{\mathalpha}{operators}{"4D}
\DeclareMathSymbol{\Nu}{\mathalpha}{operators}{"4E}
\DeclareMathSymbol{\Omicron}{\mathalpha}{operators}{"4F}
\DeclareMathSymbol{\Rho}{\mathalpha}{operators}{"50}
\DeclareMathSymbol{\Tau}{\mathalpha}{operators}{"54}
\DeclareMathSymbol{\Chi}{\mathalpha}{operators}{"58}
\DeclareMathSymbol{\omicron}{\mathord}{letters}{"6F}

```

See Section 12.5 for examples of how to produce bold Greek letters.

The symbols in this table are intended to be used in mathematical typesetting. Greek body text can be typeset using the `babel` package’s `greek` (or `polutoniko-greek`) option—and, of course, a font that provides the glyphs for the Greek alphabet.

TABLE 209:  $\mathcal{AMS}$  Greek Letters

$F$	<code>\digamma</code>	$\varkappa$	<code>\varkappa</code>
-----	-----------------------	-------------	------------------------

TABLE 210: txfonts/pxfonts Upright Greek Letters

$\alpha$	<code>\alphaup</code>	$\theta$	<code>\thetaaup</code>	$\pi$	<code>\piup</code>	$\phi$	<code>\phiup</code>
$\beta$	<code>\betaaup</code>	$\vartheta$	<code>\varthetaaup</code>	$\varpi$	<code>\varpiup</code>	$\varphi$	<code>\varphiup</code>
$\gamma$	<code>\gammaup</code>	$\iota$	<code>\iotaaup</code>	$\rho$	<code>\rhoup</code>	$\chi$	<code>\chiup</code>
$\delta$	<code>\deltaaup</code>	$\kappa$	<code>\kappaaup</code>	$\varrho$	<code>\varrhoup</code>	$\psi$	<code>\psiup</code>
$\epsilon$	<code>\epsilonup</code>	$\lambda$	<code>\lambdaaup</code>	$\sigma$	<code>\sigmaup</code>	$\omega$	<code>\omegaup</code>
$\varepsilon$	<code>\varepsilonup</code>	$\mu$	<code>\muup</code>	$\varsigma$	<code>\varsigmaup</code>		
$\zeta$	<code>\zetaup</code>	$\nu$	<code>\nuup</code>	$\tau$	<code>\tauup</code>		
$\eta$	<code>\etaup</code>	$\xi$	<code>\xiup</code>	$\upsilon$	<code>\upsilonup</code>		

The symbols in this table are intended to be used sporadically throughout a document (e.g., to represent mathematical units or numerical quantities—“ $\pi \approx 3.14159$ ”). In contrast, Greek body text can be typeset using the `babel` package’s `greek` (or `polutonikogreek`) option—and, of course, a font that provides the glyphs for the Greek alphabet.

TABLE 211: upgreek Upright Greek Letters

$\alpha$	<code>\upalpha</code>	$\theta$	<code>\uptheta</code>	$\pi$	<code>\uppi</code>	$\phi$	<code>\upphi</code>
$\beta$	<code>\upbeta</code>	$\vartheta$	<code>\upvartheta</code>	$\varpi$	<code>\upvarpi</code>	$\varphi$	<code>\upvarphi</code>
$\gamma$	<code>\upgamma</code>	$\iota$	<code>\upiota</code>	$\rho$	<code>\uprho</code>	$\chi$	<code>\upchi</code>
$\delta$	<code>\updelta</code>	$\kappa$	<code>\upkappa</code>	$\varrho$	<code>\upvarrho</code>	$\psi$	<code>\uppsi</code>
$\epsilon$	<code>\upepsilon</code>	$\lambda$	<code>\uplambda</code>	$\sigma$	<code>\upsigma</code>	$\omega$	<code>\upomega</code>
$\varepsilon$	<code>\upvarepsilon</code>	$\mu$	<code>\upmu</code>	$\varsigma$	<code>\upvarsigma</code>		
$\zeta$	<code>\upzeta</code>	$\nu$	<code>\upnu</code>	$\tau$	<code>\uptau</code>		
$\eta$	<code>\upeta</code>	$\xi$	<code>\upxi</code>	$\upsilon$	<code>\upupsilon</code>		
$\Gamma$	<code>\Uppgamma</code>	$\Lambda$	<code>\Uplambda</code>	$\Sigma$	<code>\Upsilonsigma</code>	$\Psi$	<code>\Upppsi</code>
$\Delta$	<code>\Uppdelta</code>	$\Xi$	<code>\Uppxi</code>	$\Upsilon$	<code>\Uppupsilon</code>	$\Omega$	<code>\Uppomega</code>
$\Theta$	<code>\Upptheta</code>	$\Pi$	<code>\Uppi</code>	$\Phi$	<code>\Uppphi</code>		

`upgreek` utilizes upright Greek characters from either Euler Roman (depicted above) or the PostScript Symbol font. As a result, the glyphs may appear slightly different from the above. Contrast, for example, “ $\Gamma\Delta\Theta\alpha\beta\gamma$ ” (Euler) with “ $\Gamma\Delta\Theta\alpha\beta\gamma$ ” (Symbol). Also note that the `\var...` forms do not always produce a distinct glyph.

Unlike `textgreek` (Table 6 on page 20), `upgreek` works in math mode.

The symbols in this table are intended to be used sporadically throughout a document (e.g., to represent mathematical units or numerical quantities—“ $\pi \approx 3.14159$ ”). In contrast, Greek body text can be typeset using the `babel` package’s `greek` (or `polutonikogreek`) option—and, of course, a font that provides the glyphs for the Greek alphabet.

TABLE 212: fourier Variant Greek Letters

$\pi$	<code>\pi</code>	$\rho$	<code>\rho</code>
$\varpi$	<code>\varpi</code>	$\varrho$	<code>\varrho</code>
$\varpi$	<code>\varvarpi</code>	$\varrho$	<code>\varvarrho</code>

TABLE 213: txfonts/pxfonts Variant Latin Letters

$g$	<code>\varg</code>	$v$	<code>\varv</code>	$w$	<code>\varw</code>	$y$	<code>\vary</code>
-----	--------------------	-----	--------------------	-----	--------------------	-----	--------------------

Pass the `varg` option to `txfonts/pxfonts` to replace  $g$ ,  $v$ ,  $w$ , and  $y$  with  $g$ ,  $v$ ,  $w$ , and  $y$  in every mathematical expression in your document.

TABLE 214: boisik Variant Greek Letters

$\beta$	<code>\varbeta</code>	$\kappa$	<code>\varkappa</code>	$\varpi$	<code>\varpi</code>	$\varsigma$	<code>\varsigma</code>
$\varepsilon$	<code>\varepsilon</code>	$\varphi$	<code>\varphi</code>	$\varrho$	<code>\varrho</code>	$\vartheta$	<code>\vartheta</code>

TABLE 215: boisik Variant Latin Letters

$g$	<code>\varg</code>
-----	--------------------

TABLE 216: stix Variant Greek Letters

$\varepsilon$	<code>\varepsilon</code>	$\varphi$	<code>\varphi</code>	$\varrho$	<code>\varrho</code>	$\vartheta$	<code>\vartheta</code>
$\kappa$	<code>\varkappa</code>	$\varpi$	<code>\varpi</code>	$\varsigma$	<code>\varsigma</code>		

TABLE 217: stix Transformed Greek Letters

$\varepsilon$	<code>\backepsilon</code>	$\iota$	<code>\turnediota</code>
$\mathfrak{U}$	<code>\mho</code>	$\varepsilon$	<code>\upbackepsilon</code>

TABLE 218:  $\mathcal{AMS}$  Hebrew Letters

$\beth$	<code>\beth</code>	$\gimel$	<code>\gimel</code>	$\daleth$	<code>\daleth</code>
---------	--------------------	----------	---------------------	-----------	----------------------

$\aleph$  ( $\aleph$ ) appears in Table 334 on page 157.

TABLE 219: MnSymbol Hebrew Letters

$\aleph$	<code>\aleph</code>	$\beth$	<code>\beth</code>	$\gimel$	<code>\gimel</code>	$\daleth$	<code>\daleth</code>
----------	---------------------	---------	--------------------	----------	---------------------	-----------	----------------------

TABLE 220: fdsymbol Hebrew Letters

 $\aleph$  \aleph    $\beth$  \beth    $\gimel$  \gimel    $\daleth$  \daleth

TABLE 221: boisik Hebrew Letters

 $\beth$  \beth    $\gimel$  \gimel    $\daleth$  \daleth

TABLE 222: stix Hebrew Letters

 $\aleph$  \aleph    $\beth$  \beth    $\gimel$  \gimel    $\daleth$  \daleth

TABLE 223: Letter-like Symbols

$\perp$ \bot	$\forall$ \forall	$\imath$ \imath	$\ni$ \ni	$\top$ \top
$\ell$ \ell	$\hbar$ \hbar	$\in$ \in	$\partial$ \partial	$\wp$ \wp
$\exists$ \exists	$\Im$ \Im	$\jmath$ \jmath	$\Re$ \Re	

TABLE 224:  $\mathcal{AMS}$  Letter-like Symbols

$\mathbb{k}$ \Bbbk	$\complement$ \complement	$\hbar$ \hbar
$\textcircled{R}$ \circledR	$\Finv$ \Finv	$\hslash$ \hslash
$\textcircled{S}$ \circledS	$\Game$ \Game	$\nexists$ \nexists

TABLE 225: txfonts/pxfonts Letter-like Symbols

 $\mathfrak{c}$  \mathcent    $\mathfrak{£}$  \mathsterling\*    $\notin$  \notin    $\notni$  \notni

\* It's generally preferable to use the corresponding symbol from Table 3 on page 19 because the symbols in that table work properly in both text mode and math mode.

TABLE 226: mathabx Letter-like Symbols

$\bar{\in}$ \barin	$\in$ \in	$\not\top$ \nottop	$\notin$ \notin
$\complement$ \complement	$\nexists$ \nexists	$\owns$ \owns	$\notown$ \notowner
$\exists$ \exists	$\not\bot$ \notbot	$\ownsbar$ \ownsbar	
$\Finv$ \Finv	$\notin$ \notin	$\partial$ \partial	
$\Game$ \Game	$\notowner$ \notowner	$\partialslash$ \partialslash	

TABLE 227: MnSymbol Letter-like Symbols

$\perp$	<code>\bot</code>	$\in$	<code>\in</code>	$\notin$	<code>\notin</code>	$\top$	<code>\top</code>
$\exists$	<code>\exists</code>	$\nexists$	<code>\nexists</code>	$\owns$	<code>\owns</code>	$\wp$	<code>\wp</code>
$\forall$	<code>\forall</code>	$\notin$	<code>\notin</code>	$\wp$	<code>\wp</code>		

MnSymbol provides synonyms `\notin` for `\nin`, `\ni` for `\owns`, and `\intercal` for `\top`.

TABLE 228: fdsymbol Letter-like Symbols

$\perp$	<code>\bot</code>	$\forall$	<code>\forall</code>	$\in$	<code>\in</code>	$\exists$	<code>\exists</code>
$\complement$	<code>\complement</code>	$\Game$	<code>\Game</code>	$\nexists$	<code>\nexists</code>	$\top$	<code>\top</code>
$\exists$	<code>\exists</code>	$\hbar$	<code>\hbar</code>	$\notin$	<code>\notin</code>	$\wp$	<code>\wp</code>
$\Finv$	<code>\Finv</code>	$\hslash$	<code>\hslash</code>	$\notin$	<code>\notin</code>		

fdsymbol provides synonyms `\notin` for `\nin`, `\ni` for `\owns`, and `\nni` for `\owns`.

TABLE 229: boisik Letter-like Symbols

$\Bbbk$	<code>\Bbbk</code>	$\Game$	<code>\Game</code>	$\imath$	<code>\imath</code>	$\nexists$	<code>\nexists</code>
$\complement$	<code>\complement</code>	$\hbar$	<code>\hbar</code>	$\top$	<code>\top</code>	$\wp$	<code>\wp</code>
$\Finv$	<code>\Finv</code>	$\hslash$	<code>\hslash</code>	$\jmath$	<code>\jmath</code>		

TABLE 230: stix Letter-like Symbols

$\text{\AA}$	<code>\Angstrom</code>	$\mathcal{E}$	<code>\Eulerconst</code>	$\imath$	<code>\imath</code>	$\top$	<code>\top</code>
$\mathbb{k}$	<code>\Bbbk</code>	$\exists$	<code>\exists</code>	$\top$	<code>\intercal</code>	$\perp$	<code>\topbot</code>
$\perp$	<code>\bot</code>	$\Finv$	<code>\Finv</code>	$\jmath$	<code>\jmath</code>	$\wp$	<code>\wp</code>
$\text{\textcircled{R}}$	<code>\circledR</code>	$\forall$	<code>\forall</code>	$\mathcal{D}$	<code>\mathdollar</code>	$\lambda$	<code>\Yup</code>
$\text{\textcircled{S}}$	<code>\circledS</code>	$\Game$	<code>\Game</code>	$\mathcal{P}$	<code>\mathparagraph</code>	$\mathbb{Z}$	<code>\Zbar</code>
$\complement$	<code>\complement</code>	$\hbar$	<code>\hbar</code>	$\mathcal{L}$	<code>\mathsterling</code>		
$\mathcal{F}$	<code>\digamma</code>	$\hslash$	<code>\hslash</code>	$\nexists$	<code>\nexists</code>		
$\ell$	<code>\ell</code>	$\Im$	<code>\Im</code>	$\Re$	<code>\Re</code>		

TABLE 231: trfsigns Letter-like Symbols

$e$	<code>\e</code>	$j$	<code>\im</code>
-----	-----------------	-----	------------------

TABLE 232: mathdesign Letter-like Symbols

$\in$	<code>\in</code>	$\ni$	<code>\owns</code>
$\notin$	<code>\notin</code>	$\in$	<code>\smallin</code>
$\notin$	<code>\notsmallin</code>	$\ni$	<code>\smallowns</code>
$\notin$	<code>\notsmallowns</code>		

The `mathdesign` package additionally provides versions of each of the letter-like symbols shown in Table 224.

TABLE 233: fge Letter-like Symbols

$\forall$	<code>\fgeA</code>	$\text{g}$	<code>\fgeeszett</code>	$\text{B}$	<code>\fgeleftB</code>	$f$	<code>\fges</code>
$\text{c}$	<code>\fgec</code>	$\text{H}$	<code>\fgeF</code>	$\text{C}$	<code>\fgeleftC</code>		
$\text{p}$	<code>\fged</code>	$\text{f}$	<code>\fgef</code>	$\text{f}$	<code>\fgemark*</code>		
$\text{b}$	<code>\fgee</code>	$\text{b}$	<code>\fgelb*</code>	$\text{B}$	<code>\fgerightB</code>		

\* The `fge` package defines `\fgeeta`, `\fgeN`, and `\fgeoverU` as synonyms for `\fgelb` and `\fgeU` as a synonym for `\fgemark`.

TABLE 234: fourier Letter-like Symbols

$\partial$	<code>\partial</code>	$\partial$	<code>\varpartialdiff</code>
------------	-----------------------	------------	------------------------------

TABLE 235: cml Letter-like Symbols


$\perp$	<code>\Bot</code>	$\perp$	<code>\simbot</code>
---------	-------------------	---------	----------------------

TABLE 236: logix Proof Symbols

$\exists$	<code>\BnchExists</code>	$\perp$	<code>\Bot</code>	$\forall$	<code>\HdnForAll</code>	$\text{F}$	<code>\TFBoth</code>
$\forall$	<code>\BnchForAll</code>	$:=$	<code>\Defn</code>	$\text{f}$	<code>\NFalse</code>	$\perp$	<code>\TFNone</code>
$\exists$	<code>\BnchHdnExists</code>	$\square$	<code>\End</code>	$\text{f}$	<code>\NtExists</code>	$\text{T}$	<code>\Top</code>
$\forall$	<code>\BnchHdnForAll</code>	$\exists$	<code>\Exists</code>	$\perp$	<code>\NTrue</code>	$\text{T}$	<code>\True</code>
$\text{f}$	<code>\BnchNtExists</code>	$\text{F}$	<code>\False</code>	$\blacksquare$	<code>\Qed</code>	$\exists!$	<code>\Unique</code>
$\exists!$	<code>\BnchUnique</code>	$\forall$	<code>\ForAll</code>	$\wedge$	<code>\QuantCon</code>		
$\lambda$	<code>\BndMap</code>	$\exists$	<code>\HdnExists</code>	$\vee$	<code>\QuantDis</code>		

logix requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 237: endofproofwd End-of-Proof Symbols

 `\wasserdicht`

`\wasserdicht` is implemented as an external PDF graphic. The command in fact typesets the symbol flush right on the page to signify the end of proof. To use the command in inline text, simply load the underlying graphic file directly:

```
\includegraphics[width=10pt]{endofproofwd.pdf}
```

TABLE 238:  $\mathcal{AMS}$  Delimiters

```
[ \ulcorner ] \urcorner
L \llcorner ] \lrcorner
```

TABLE 239: stmaryrd Delimiters

```
{ \Lbag } \Rbag { \lbag } \rbag
|| \llceil || \rrceil || \llfloor || \rrfloor
( \llparenthesis ) \rrparenthesis
```

TABLE 240: mathabx Delimiters

```
[ \lcorners ] \rcorners
[ \ulcorner ] \urcorner
L \llcorner ] \lrcorner
```

TABLE 241: boisik Delimiters

```
[ \ulcorner ] \urcorner
L \llcorner ] \lrcorner
```

TABLE 242: stix Delimiters

```
< \langedot > \rangedot << \llangle >> \rrangle
? \lbag } \rbag L \llcorner ] \lrcorner
( \lblrbrak ) \rblrbrak ( \llparenthesis ) \rrparenthesis
[ \lbracklltick ] \rbrackurtick ⚡ \lparengtr ⚡ \rparenless
[ \lbrackubar ] \rbrackubar ⚡ \lparenless ⚡ \rparengtr
[ \lbracklrtick ] \rbracklrtick ⚡ \lvzigzag ⚡ \rvzigzag
( \Lbrbrak ) \Rbrbrak ⚡ \Lvzigzag ⚡ \Rvzigzag
< \lcurvyangle > \rcurvyangle [ \ulcorner ] \urcorner
```



TABLE 243: nath Delimiters

$$\lfloor \quad \backslash \text{niv} \quad \rfloor \quad \backslash \text{vin}$$

TABLE 244: Variable-sized Delimiters

$\downarrow$	$\Downarrow$	<code>\downarrow</code>	$\Downarrow$	<code>\Downarrow</code>	$[$	$[$	$[$	$]$	$]$	$]$
$\langle$	$\rangle$	<code>\langle</code>	$\rangle$	<code>\rangle</code>	$ $	$ $	$ $	$\parallel$	$\parallel$	<code>\ </code>
$\lceil$	$\rceil$	<code>\lceil</code>	$\rceil$	<code>\rceil</code>	$\uparrow$	$\uparrow$	<code>\uparrow</code>	$\Uparrow$	$\Uparrow$	<code>\Uparrow</code>
$\lfloor$	$\rfloor$	<code>\lfloor</code>	$\rfloor$	<code>\rfloor</code>	$\Updownarrow$	$\Updownarrow$	<code>\updownarrow</code>	$\Updownarrow$	$\Updownarrow$	<code>\Updownarrow</code>
$($	$)$	<code>(</code>	$)$	<code>)</code>	$\{$	$\{$	<code>\{</code>	$\}$	$\}$	<code>\}</code>
$/$	$/$	<code>/</code>	$\backslash$	<code>\backslash</code>						

When used with `\left` and `\right`, these symbols expand to the height of the enclosed math expression. Note that `\vert` is a synonym for `|`, and `\Vert` is a synonym for `\|`.

$\varepsilon$ -TeX provides a `\middle` analogue to `\left` and `\right`. `\middle` can be used, for example, to make an internal “|” expand to the height of the surrounding `\left` and `\right` symbols. (This capability is commonly needed when typesetting adjacent bras and kets in Dirac notation: “ $\langle\phi|\psi\rangle$ ”). This is exactly what the `quantikz` package does (see Table 370 on page 171). A similar effect can be achieved in conventional L<sup>A</sup>T<sub>E</sub>X using the `braket` package.

TABLE 245: Large, Variable-sized Delimiters

$\int$	$\int$	<code>\lmoustache</code>	$\int$	$\int$	<code>\rmoustache</code>	$\int$	$\int$	<code>\lgroup</code>	$\int$	$\int$	<code>\rgroup</code>
$ $	$ $	<code>\arrowvert</code>	$\parallel$	$\parallel$	<code>\Arrowvert</code>	$ $	$ $	<code>\bracevert</code>			

These symbols *must* be used with `\left` and `\right`. The `mathabx` package, however, redefines `\lgroup` and `\rgroup` so that those symbols can work without `\left` and `\right`.

TABLE 246:  $\mathcal{AMS}$  Variable-sized Delimiters

		<code>\lvert</code>			<code>\rvert</code>
		<code>\lVert</code>			<code>\rVert</code>

According to the `amsmath` documentation [AMS99], the preceding symbols are intended to be used as delimiters (e.g., as in “ $| - z |$ ”) while the `\vert` and `\Vert` symbols (Table 244) are intended to be used as operators (e.g., as in “ $p|q$ ”).

TABLE 247: `stmaryrd` Variable-sized Delimiters

⌈	⌈	<code>\llbracket</code>	⌋	⌋	<code>\rrbracket</code>
---	---	-------------------------	---	---	-------------------------

TABLE 248: `mathabx` Variable-sized Delimiters

⌈	⌈	<code>\ldbrack</code>	⌋	⌋	<code>\rdbrack</code>
⌈	⌈	<code>\lfilet</code>	⌋	⌋	<code>\rfilet</code>
		<code>\thickvert</code>			<code>\vvvert</code>

TABLE 249: `MnSymbol` Variable-sized Delimiters

		<code>\Arrowvert</code>	{	{	<code>\lbrace</code>	}	}	<code>\rceil</code>
		<code>\arrowvert</code>	[	[	<code>\lceil</code>	]	]	<code>\rfloor</code>

(continued on next page)

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$\backslash$	$\backslash$	<code>\backslash</code>	$[$	$[$	<code>\lfloor</code>	$)$	$)$	<code>\rgroup</code>
$ $	$ $	<code>\bracevert</code>	$($	$($	<code>\lgroup</code>	$\backslash$	$\backslash$	<code>\rmoustache</code>
$[$	$[$	$[$	$\llcorner$	$\llcorner$	<code>\llangle</code>	$\ggcorner$	$\ggcorner$	<code>\rrangle</code>
$]$	$]$	$]$	$\llcorner$	$\llcorner$	<code>\llcorner</code>	$\llcorner$	$\llcorner$	<code>\rsem</code>
$($	$($	$($	$\lrcorner$	$\lrcorner$	<code>\lmoustache</code>	$\lrcorner$	$\lrcorner$	<code>\rWavy</code>
$)$	$)$	$)$	$\lrcorner$	$\lrcorner$	<code>\lrcorner</code>	$\lrcorner$	$\lrcorner$	<code>\rwny</code>
$/$	$/$	$/$	$\llcorner$	$\llcorner$	<code>\lsem</code>	$\llcorner$	$\llcorner$	<code>\ulcorner</code>
$\langle$	$\langle$	$\langle$	$\lrcorner$	$\lrcorner$	<code>\lwny</code>	$\lrcorner$	$\lrcorner$	<code>\ullcorner</code>
$\rangle$	$\rangle$	$\rangle$	$\lrcorner$	$\lrcorner$	<code>\lWavy</code>	$\lrcorner$	$\lrcorner$	<code>\ulrcorner</code>
$ $	$ $	$ $	$\rangle$	$\rangle$	<code>\rangle</code>	$\rangle$	$\rangle$	<code>\urcorner</code>
$\langle$	$\langle$	<code>\langle</code>	$\rangle$	$\rangle$	<code>\ranglebar</code>	$\parallel$	$\parallel$	<code>\parallel</code>
$\langle$	$\langle$	<code>\langlebar</code>	$\rangle$	$\rangle$	<code>\rangle</code>			<code>\rbrace</code>

`\vert` is a synonym for `|`. `\Vert` is a synonym for `\|`. `\mid` and `\mvert` produce the same symbol as `\vert` but designated as math relations instead of ordinals. `\divides` produces the same symbol as `\vert` but designated as a binary operator instead of an ordinal. `\parallel` and `\mVert` produce the same symbol as `\Vert` but designated as math relations instead of ordinals.

TABLE 250: fdsymbol Variable-sized Delimiters

$\backslash$	$\backslash$	<code>\backslash</code>	$\lrcorner$	$\lrcorner$	<code>\lrcorner</code>	$)$	$)$	<code>\rparen</code>
$\downarrow$	$\downarrow$	<code>\downarrow</code>	$ $	$ $	<code>\lvert</code>	$ $	$ $	<code>\rvert</code>
$\Downarrow$	$\Downarrow$	<code>\Downarrow</code>	$\parallel$	$\parallel$	<code>\lVert</code>	$\parallel$	$\parallel$	<code>\rVert</code>
$\langle\langle$	$\langle\langle$	<code>\lAngle</code>	$\lll$	$\lll$	<code>\lVvert</code>	$\lll$	$\lll$	<code>\rVvert</code>
$\langle$	$\langle$	<code>\langle</code>	$/$	$/$	<code>\mathslash</code>	$\ulcorner$	$\ulcorner$	<code>\ulcorner</code>
$\langle\langle\cdot$	$\langle\langle\cdot$	<code>\langedot</code>	$\rangle$	$\rangle$	<code>\rangle</code>	$\ulcorner$	$\ulcorner$	<code>\ullcorner</code>
$\{$	$\{$	<code>\lbrace</code>	$\rangle\rangle$	$\rangle\rangle$	<code>\rAngle</code>	$\ulcorner$	$\ulcorner$	<code>\ulrcorner</code>
$[$	$[$	<code>\lbrack</code>	$\rangle\cdot$	$\rangle\cdot$	<code>\rangledot</code>	$\uparrow$	$\uparrow$	<code>\uparrow</code>
$\llbracket$	$\llbracket$	<code>\lBrack</code>	$\}$	$\}$	<code>\rbrace</code>	$\Uparrow$	$\Uparrow$	<code>\Uparrow</code>
$\lceil$	$\lceil$	<code>\lceil</code>	$\parallel$	$\parallel$	<code>\rBrack</code>	$\updownarrow$	$\updownarrow$	<code>\updownarrow</code>
$\lfloor$	$\lfloor$	<code>\lfloor</code>	$\rfloor$	$\rfloor$	<code>\rbrack</code>	$\Updownarrow$	$\Updownarrow$	<code>\Updownarrow</code>
$\lgroup$	$\lgroup$	<code>\lgroup</code>	$\lceil$	$\lceil$	<code>\rceil</code>	$\urcorner$	$\urcorner$	<code>\urcorner</code>
$\llcorner$	$\llcorner$	<code>\llcorner</code>	$\rfloor$	$\rfloor$	<code>\rfloor</code>	$\vert$	$\vert$	<code>\vert</code>

*(continued on next page)*

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$\int$	$\int$	<code>\lmoustache</code>	$)$	$\}$	<code>\rgroup</code>	$\parallel$	$\parallel\parallel$	<code>\Vert</code>
$($	$($	<code>\lparen</code>	$\{$	$\}$	<code>\rmoustache</code>	$\parallel\parallel$	$\parallel\parallel\parallel$	<code>\Vvert</code>

`fdsymbol` defines “(” as a synonym for `\lparen`, “)” as a synonym for `\rparen`, “[” as a synonym for `\lbrack`, “]” as a synonym for `\rbrack`, “{” as a synonym for `\lbrace`, “}” as a synonym for `\rbrace`, “/” as a synonym for `\mathslash`, “|” as a synonym for `\vert`, “\|” as a synonym for `\Vert`, `\lsem` as a synonym for `\lBrack`, and `\rsem` as a synonym for `\rBrack`.

TABLE 251: stix Variable-sized Delimiters

$\uparrow$	$\uparrow\uparrow$	<code>\Arrowvert</code>	$\ll$	$\lll$	<code>\lAngle</code>	$\lceil$	$\rceil$	<code>\rceil</code>
$\downarrow$	$\downarrow$	<code>\arrowvert</code>	$\{$	$\{$	<code>\lbrace</code>	$\rfloor$	$\rfloor$	<code>\rfloor</code>
$\backslash$	$\backslash$	<code>\backslash</code>	$\{\}$	$\{\}$	<code>\lBrace</code>	$\)$	$\)$	<code>\rgroup</code>
$\Downarrow$	$\Downarrow$	<code>\Ddownarrow</code>	$\parallel$	$\parallel\parallel$	<code>\lBrack</code>	$\l$	$\l$	<code>\rmoustache</code>
$\Downarrow$	$\Downarrow$	<code>\DDownarrow</code>	$\langle$	$\langle$	<code>\lbrbrak</code>	$\rangle$	$\rangle$	<code>\rParen</code>
$\downarrow$	$\downarrow$	<code>\downarrow</code>	$\lceil$	$\lceil$	<code>\lceil</code>	$\uparrow$	$\uparrow$	<code>\uparrow</code>

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$\Downarrow$	$\Downarrow$	<code>\Downarrow</code>	$\lfloor$	$\lfloor$	<code>\lfloor</code>	$\Uparrow$	$\Uparrow$	<code>\Uparrow</code>
$[$	$[$	<code>[</code>	$($	$($	<code>\lgroup</code>	$\Updownarrow$	$\Updownarrow$	<code>\Updownarrow</code>
$]$	$]$	<code>]</code>	$\int$	$\int$	<code>\lmoustache</code>	$\updownarrow$	$\updownarrow$	<code>\updownarrow</code>
$($	$($	<code>(</code>	$($	$($	<code>\lParen</code>	$\Uparrow$	$\Uparrow$	<code>\Uparrow</code>
$)$	$)$	<code>)</code>	$\gg$	$\gg$	<code>\rAngle</code>	$\Uparrow$	$\Uparrow$	<code>\Uparrow</code>
$/$	$/$	<code>/</code>	$\rangle$	$\rangle$	<code>\rangle</code>	$\parallel$	$\parallel$	<code>\Vert</code>
$\langle$	$\langle$	<code>&lt;</code>	$\}$	$\}$	<code>\rbrace</code>	$ $	$ $	<code>\vert</code>
$\rangle$	$\rangle$	<code>&gt;</code>	$\} $	$\} $	<code>\rbrace</code>	$\parallel$	$\parallel$	<code>\Vvert</code>
$ $	$ $	<code> </code>	$\parallel$	$\parallel$	<code>\rBrack</code>			
$\langle$	$\langle$	<code>\langle</code>	$\rangle$	$\rangle$	<code>\rbrbrak</code>			

TABLE 252: mathdesign Variable-sized Delimiters

$\left\langle$	$\left\langle$	<code>\leftwave</code>	$\right\langle$	$\right\langle$	<code>\rightwave</code>
$\left\langle$	$\left\langle$	<code>\lefttevaw</code>	$\right\langle$	$\right\langle$	<code>\righttevaw</code>

The definitions of these symbols include a preceding `\left` or `\right`. It is therefore an error to specify `\left` or `\right` explicitly. The internal, “primitive” versions of these symbols are called `\lwave`, `\rwave`, `\levaw`, and `\revaw`.

TABLE 253: `nath` Variable-sized Delimiters (Double)

$\langle\langle$	<code>\lAngle</code>	$\rangle\rangle$	<code>\rAngle</code>
$\llbracket$	<code>\lBrack</code>	$\rrbracket$	<code>\rBrack</code>
$\lceil$	<code>\lCeil</code>	$\rceil$	<code>\rCeil</code>
$\lfloor$	<code>\lFloor</code>	$\rfloor$	<code>\rFloor</code>
$\lVert$	<code>\lVert*</code>	$\rVert$	<code>\rVert*</code>

\* `nath` redefines all of the above to include implicit `\left` and `\right` commands. Hence, separate `\lVert` and `\rVert` commands are needed to disambiguate whether “|” is a left or right delimiter.

All of the symbols in Table 253 can also be expressed using the `\double` macro. See the `nath` documentation for examples and additional information.

TABLE 254: `nath` Variable-sized Delimiters (Triple)

$\langle\langle\langle$	<code>\triple&lt;</code>	$\rangle\rangle\rangle$	<code>\triple&gt;</code>
$\lllbracket$	<code>\triple[</code>	$\rrrbracket$	<code>\triple]</code>
$\lllVert$	<code>\ltriple *</code>	$\rrrVert$	<code>\rtriple *</code>

\* Similar to `\lVert` and `\rVert` in Table 253, `\ltriple` and `\rtriple` must be used instead of `\triple` to disambiguate whether “|” is a left or right delimiter.

Note that `\triple`—and the corresponding `\double`—is actually a macro that takes a delimiter as an argument.

TABLE 255: `fourier` Variable-sized Delimiters

$\llbracket$	<code>\llbracket</code>	$\rrbracket$	<code>\rrbracket</code>
$\lllVert$	<code>\VERT</code>		

TABLE 256: logix Variable-sized Delimiters

		\BndBar			
<	<	\OpnAngl	>	>	\ClsAngl
<	<	\OpnAnglBar	>	>	\ClsAnglBar
<	<	\OpnArrwBrac	>	>	\ClsArrwBrac
		\OpnBar			\ClsBar
{	{	\OpnBrac	}	}	\ClsBrac
{	{	\OpnBracBar	}	}	\ClsBracBar
{	{	\OpnBrknBrac	}	}	\ClsBrknBrac
{	{	\OpnBrknBracBar	}	}	\ClsBrknBracBar
{	{	\OpnBrknBrkt	}	}	\ClsBrknBrkt
{	{	\OpnBrknBrktBar	}	}	\ClsBrknBrktBar
[	[	\OpnBrkt	]	]	\ClsBrkt
[	[	\OpnBrktBar	]	]	\ClsBrktBar
[	[	\OpnCeil	]	]	\ClsCeil
{	{	\OpnCircBrac	}	}	\ClsCircBrac
{	{	\OpnCircBracBar	}	}	\ClsCircBracBar
{	{	\OpnCircBrkt	}	}	\ClsCircBrkt
{	{	\OpnCircBrktBar	}	}	\ClsCircBrktBar
{	{	\OpnCrlyBrkt	}	}	\ClsCrlyBrkt
{	{	\OpnCrlyBrktBar	}	}	\ClsCrlyBrktBar
<	<	\OpnCurvAngl	>	>	\ClsCurvAngl
<<	<<	\OpnDblAngl	>>	>>	\ClsDblAngl
		\OpnDblBar			\ClsDblBar

(continued on next page)



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{	{	<code>\OpnDblBrac</code>	}	}	<code>\ClsDblBrac</code>
⌈	⌈	<code>\OpnDblCeil</code>	⌋	⌋	<code>\ClsDblCeil</code>
⌋	⌋	<code>\OpnDblFloor</code>	⌈	⌈	<code>\ClsDblFloor</code>
[	[	<code>\OpnDblGrp</code>	]	]	<code>\ClsDblGrp</code>
(	(	<code>\OpnDblParn</code>	)	)	<code>\ClsDblParn</code>
⌊	⌊	<code>\OpnFloor</code>	⌋	⌋	<code>\ClsFloor</code>
[	[	<code>\OpnGrp</code>	]	]	<code>\ClsGrp</code>
(	(	<code>\OpnParn</code>	)	)	<code>\ClsParn</code>
(	(	<code>\OpnParnBar</code>	)	)	<code>\ClsParnBar</code>
[	[	<code>\OpnSqrParn</code>	]	]	<code>\ClsSqrParn</code>
(	(	<code>\OpnTortoise</code>	)	)	<code>\ClsTortoise</code>
(	(	<code>\OpnTortoiseBar</code>	)	)	<code>\ClsTortoiseBar</code>
≡	≡	<code>\OpnTrpBar</code>	≡	≡	<code>\ClsTrpBar</code>
⊢	⊢	<code>\OpnTurn</code>	⊣	⊣	<code>\ClsTurn</code>

logix requires either `LuaATeX` or `XYTeX`.

TABLE 257: `textcomp` Text-mode Delimiters

<	<code>\textlangle</code>	>	<code>\textrangle</code>
⌈	<code>\textlbrackdbl</code>	⌋	<code>\textrbrackdbl</code>
{	<code>\textlquill</code>	}	<code>\textrquill</code>

TABLE 258: `metre` Text-mode Delimiters

}	<code>\alad</code>	}	<code>\Alad</code>	†	<code>\crux</code>	†	<code>\Crux</code>
{	<code>\alas</code>	{	<code>\Alas</code>	]	<code>\quadrad</code>	]	<code>\Quadrad</code>
>	<code>\angud</code>	>	<code>\Angud</code>	[	<code>\quadras</code>	[	<code>\Quadras</code>
<	<code>\angus</code>	<	<code>\Angus</code>				

TABLE 259: Math-mode Accents

$\acute{a}$	<code>\acute{a}</code>	$\check{a}$	<code>\check{a}</code>	$\grave{a}$	<code>\grave{a}</code>	$\tilde{a}$	<code>\tilde{a}</code>
$\bar{a}$	<code>\bar{a}</code> *	$\ddot{a}$	<code>\ddot{a}</code>	$\hat{a}$	<code>\hat{a}</code>	$\vec{a}$	<code>\vec{a}</code>
$\breve{a}$	<code>\breve{a}</code>	$\dot{a}$	<code>\dot{a}</code>	$\mathring{a}$	<code>\mathring{a}</code>		

Note also the existence of `\imath` and `\jmath`, which produce dotless versions of “*i*” and “*j*”. (See Table 334 on page 157.) These are useful when the accent is supposed to replace the dot. For example, “`\hat{\imath}`” produces a correct “ $\hat{i}$ ”, while “`\hat{i}`” would yield the rather odd-looking “ $\hat{i}$ ”.

\* The `\overline` command (Table 270 on page 139) produces a wider accent than `\bar`: “ $\overline{A}$ ” vs. “ $\bar{A}$ ”. However, unlike adjacent `\bars`, adjacent `\overlines` run together, which is often not desired: “ $\overline{AB}$ ” vs. “ $\bar{A}\bar{B}$ ”. If wider bars than `\bar` are needed, the following code from Enrico Gregorio can be used to add the requisite inter-symbol spacing [Gre09]:

```
\newcommand{\closure}[2][3]{%
  {} \mkern#1mu \overline{\mkern-#1mu#2}}
```

With that definition, “`\closure{A}\closure{B}`” produces “ $\overline{A}\overline{B}$ ”, with a visible gap between the two accents. The optional argument can be used to fine-tune the spacing.

TABLE 260:  $\mathcal{AMS}$  Math-mode Accents

$\dddot{a}$	<code>\dddot{a}</code>	$\dotted{a}$	<code>\dotted{a}</code>
-------------	------------------------	--------------	-------------------------

These accents are also provided by the `mathabx` and `accents` packages and are redefined by the `mathdots` package if the `amsmath` and `amssymb` packages have previously been loaded. All of the variations except for the original  $\mathcal{AMS}$  ones tighten the space between the dots (from  $\dddot{a}$  to  $\dotted{a}$ ). The `mathabx` and `mathdots` versions also function properly within subscripts and superscripts ( $x^{\dotted{a}}$  instead of  $x^{\dddot{a}}$ ).

TABLE 261: MnSymbol Math-mode Accents

$\vec{a}$	<code>\vec{a}</code>
-----------	----------------------

TABLE 262: fdsymbol Math-mode Accents

$\overline{a}$	<code>\middlebar{a}</code>	$\cancel{a}$	<code>\strokethrough{a}</code>
$\overline{/a}$	<code>\middleslash{a}</code>	$\vec{a}$	<code>\vec{a}</code>

`\middlebar` and `\middleslash` are applied here to “ $a$ ” for consistency with the rest of the document, but they generally look better when applied to taller lowercase characters.

TABLE 263: boisik Math-mode Accents

$\vec{a}$	<code>\vec{a}</code>
-----------	----------------------

TABLE 264: stix Math-mode Accents

$\acute{a}$	<code>\acute{a}</code>	$\hat{a}$	<code>\hat{a}</code>
$\overline{a}$	<code>\annuity{a}</code>	$\overleftarrow{a}$	<code>\leftarrowaccent{a}</code>
$\overset{*}{a}$	<code>\asteraccent{a}</code>	$\overleftarrow{\smile}a$	<code>\leftharpoonaccent{a}</code>
$\bar{a}$	<code>\bar{a}</code>	$\overleftrightarrow{a}$	<code>\leftrightharpoonaccent{a}</code>
$\breve{a}$	<code>\breve{a}</code>	$\mathring{a}$	<code>\mathring{a}</code>
$\candra{a}$	<code>\candra{a}</code>	$\mathring{a}$	<code>\ocommatoprigh{a}</code>
$\check{a}$	<code>\check{a}</code>	$\mathring{a}$	<code>\oturnedcomma{a}</code>
$\ddot{\cdot}a$	<code>\ddddot{a}</code>	$\mathring{a}$	<code>\ovhook{a}</code>
$\ddot{a}$	<code>\dddot{a}</code>	$\overrightarrow{a}$	<code>\rightharpoonaccent{a}</code>
$\ddot{a}$	<code>\ddot{a}</code>	$\tilde{a}$	<code>\tilde{a}</code>
$\dot{a}$	<code>\dot{a}</code>	$\vec{a}$	<code>\vec{a}</code>
$\bar{a}$	<code>\droang{a}</code>	$\overline{\overline{a}}$	<code>\widebridgeabove{a}</code>
$\grave{a}$	<code>\grave{a}</code>		

TABLE 265: fge Math-mode Accents

$\hat{A}$	<code>\spiritusasper{A}</code>	$\hat{a}$	<code>\spiritusasper{a}</code>
$\grave{A}$	<code>\spirituslenis{A}</code>	$\grave{a}$	<code>\spirituslenis{a}</code>

When `fge` is passed the `crescent` option, these symbols instead uses a crescent accent as in “ $\hat{a}$ ” and “ $\grave{a}$ ”.

TABLE 266: yhmath Math-mode Accents

$\mathring{a}$	<code>\ring{a}</code>
----------------	-----------------------

This symbol is largely obsolete, as standard  $\text{\LaTeX} 2_{\epsilon}$  has supported `\mathring` (Table 259) since June 1998 [L<sup>A</sup>T<sub>98</sub>].

TABLE 267: pdfMsym Math-mode Accents

$\vec{a}$	<code>\shortlvecc{a}</code>	$\underline{a}$	<code>\shortunderleftrightharp{a}</code>
$\overleftarrow{a}$	<code>\shortoverleftharp{a}</code>	$\overleftarrow{a}$	<code>\shortunderleftrightvecc{a}</code>
$\overrightarrow{a}$	<code>\shortoverleftrightharp{a}</code>	$\underline{a}$	<code>\shortunderlvecc{a}</code>
$\overleftarrow{a}$	<code>\shortoverleftrightvecc{a}</code>	$\underline{a}$	<code>\shortunderrightharp{a}</code>
$\overrightarrow{a}$	<code>\shortoverrightharp{a}</code>	$\underline{a}$	<code>\shortunderrightleftharp{a}</code>
$\overrightarrow{a}$	<code>\shortoverrightleftharp{a}</code>	$\underline{a}$	<code>\shortunderstraightlvecc{a}</code>
$\overrightarrow{a}$	<code>\shortstraightlvecc{a}</code>	$\underline{a}$	<code>\shortunderstraightvecc{a}</code>
$\overrightarrow{a}$	<code>\shortstraightvecc{a}</code>	$\underline{a}$	<code>\shortundervecc{a}</code>
$\underline{a}$	<code>\shortunderleftharp{a}</code>	$\vec{a}$	<code>\shortvecc{a}</code>

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

TABLE 268: halloweenmath Halloween-Themed Math-mode Accents

$\overhat{a}$	<code>\overbat{a}</code>	$\underhat{a}$	<code>\underbat{a}</code>
$\overhat{*a}$	<code>\overbat*{a}</code>	$\underhat{*a}$	<code>\underbat*{a}</code>

TABLE 269: realhats Math-mode Hat Accents

$\hat{a}$	<code>\hat[ash]{a}</code>	$\hat{a}$	<code>\hat[santa]{a}</code>
$\hat{a}$	<code>\hat[beret]{a}</code>	$\hat{a}$	<code>\hat[scottish]{a}</code>
$\hat{a}$	<code>\hat[birthday]{a}</code>	$\hat{a}$	<code>\hat[sombrero]{a}</code>
$\hat{a}$	<code>\hat[cowboy]{a}</code>	$\hat{a}$	<code>\hat[tile-blue]{a}</code>
$\hat{a}$	<code>\hat[crown]{a}</code>	$\hat{a}$	<code>\hat[tile-gray]{a}</code>
$\hat{a}$	<code>\hat[dunce]{a}</code>	$\hat{a}$	<code>\hat[tile-light-blue]{a}</code>
$\hat{a}$	<code>\hat[fez]{a}</code>	$\hat{a}$	<code>\hat[tile-white]{a}</code>
$\hat{a}$	<code>\hat[mortarboard]{a}</code>	$\hat{a}$	<code>\hat[tophat]{a}</code>
$\hat{a}$	<code>\hat[policeman]{a}</code>	$\hat{a}$	<code>\hat[witch]{a}</code>

These hats are drawn by scaling a graphic image and placing it at an appropriate location.

If `\hat` is used with no argument, it selects a hat at random. Alternatively, a hat type can be passed as an option to `realhats` to specify the default hat. See the `realhats` documentation for more information.

TABLE 270: Extensible Accents

$\widetilde{abc}$	<code>\widetilde{abc}</code> *	$\widehat{abc}$	<code>\widehat{abc}</code> *
$\overleftarrow{abc}$	<code>\overleftarrow{abc}</code> †	$\overrightarrow{abc}$	<code>\overrightarrow{abc}</code> †
$\overline{abc}$	<code>\overline{abc}</code>	$\underline{abc}$	<code>\underline{abc}</code>
$\overbrace{abc}$	<code>\overbrace{abc}</code>	$\underbrace{abc}$	<code>\underbrace{abc}</code>
$\sqrt{abc}$	<code>\sqrt{abc}</code> ‡		

As demonstrated in a 1997 TUGboat article about typesetting long-division problems [Gib97], an extensible long-division sign (“ $\overline{abc}$ ”) can be faked by putting a “`\big`” in a `tabular` environment with an `\hline` or `\cline` in the preceding row. The article also presents a piece of code (uploaded to CTAN as `longdiv.tex`) that automatically solves and typesets—by putting an `\overline` atop “`\big`” and the desired text—long-division problems. More recently, the STIX fonts include a true long-division sign. See `\longdivision` in Table 276 for a sample of this symbol. See also the `polynom` package, which automatically solves and typesets polynomial-division problems in a similar manner.

\* These symbols are made more extensible by the `MnSymbol` package (Table 274 on page 140). and even more extensible by the `yhmath` package (Table 272).

† If you’re looking for an extensible *diagonal* line or arrow to be used for canceling or reducing mathematical subexpressions (e.g., “ $x + \cancel{x}$ ” or “ $3 + 2 \cancel{^5}$ ”) then consider using the `cancel` package.

‡ With an optional argument, `\sqrt` typesets *nth* roots. For example, “`\sqrt[3]{abc}`” produces “ $\sqrt[3]{abc}$ ” and “`\sqrt[n]{abc}`” produces “ $\sqrt[n]{abc}$ ”.

TABLE 271: `\overrightarrow` Extensible Accents

$\overrightarrow{abc}$	<code>\Overrightarrow{abc}</code>
------------------------	-----------------------------------

TABLE 272: `yhmath` Extensible Accents

$\widehat{abc}$	<code>\widehat{abc}</code>	$\widetilde{abc}$	<code>\widetilde{abc}</code>
$\wideparen{abc}$	<code>\wideparen{abc}</code>	$\widehat{abc}$	<code>\widehat{abc}</code>
$\widehat{\circ}abc$	<code>\widehat{\circ}abc</code>		

TABLE 273:  $\mathcal{AMS}$  Extensible Accents

$\overleftrightarrow{abc}$	<code>\overleftrightharrow{abc}</code>	$\overleftarrow{abc}$	<code>\underleftrightharrow{abc}</code>
$\overleftarrow{abc}$	<code>\underleftarrow{abc}</code>	$\overrightarrow{abc}$	<code>\underrightharrow{abc}</code>

TABLE 274: MnSymbol Extensible Accents

$\overbrace{abc}$	<code>\overbrace{abc}</code>	$\underbrace{abc}$	<code>\undergroup{abc}</code>
$\overgroup{abc}$	<code>\overgroup{abc}</code>	$\underline{abc}$	<code>\underlinesegment{abc}</code>
$\overleftharpoonup{abc}$	<code>\overleftharpoonup{abc}</code>	$\widehat{abc}$	<code>\widehat{abc}</code>
$\overlinesegment{abc}$	<code>\overlinesegment{abc}</code>	$\wideparen{abc}$	<code>\wideparen{abc}</code>
$\overrightarrow{abc}$	<code>\overrightarrow{abc}</code>	$\widetilde{abc}$	<code>\widetilde{abc}</code>
$\underbrace{abc}$	<code>\underbrace{abc}</code>		

TABLE 275: fdsymbol Extensible Accents

$\overbrace{abc}$	<code>\overbrace{abc}</code>	$\underbrace{abc}$	<code>\undergroup{abc}</code>
$\overgroup{abc}$	<code>\overgroup{abc}</code>	$\underline{abc}$	<code>\underlinesegment{abc}</code>
$\overleftharpoonup{abc}$	<code>\overleftharpoonup{abc}</code>	$\widehat{abc}$	<code>\widehat{abc}</code>
$\overlinesegment{abc}$	<code>\overlinesegment{abc}</code>	$\wideparen{abc}$	<code>\wideparen{abc}</code>
$\overrightarrow{abc}$	<code>\overrightarrow{abc}</code>	$\widetilde{abc}$	<code>\widetilde{abc}</code>
$\underbrace{abc}$	<code>\underbrace{abc}</code>		

TABLE 276: stix Extensible Accents

$\overlongdiv{abc}$	<code>\longdivision{abc}</code>	$\underline{abc}$	<code>\underbracket{abc}</code>
$\overbrace{abc}$	<code>\overbrace{abc}</code>	$\underlineleftarrow{abc}$	<code>\underleftarrow{abc}</code>
$\overbracket{abc}$	<code>\overbracket{abc}</code>	$\underleftharpoonup{abc}$	<code>\underleftharpoonup{abc}</code>
$\overleftarrow{abc}$	<code>\overleftarrow{abc}</code>	$\underleftrightharpoonup{abc}$	<code>\underleftrightharpoonup{abc}</code>
$\overleftharpoonup{abc}$	<code>\overleftharpoonup{abc}</code>	$\underparen{abc}$	<code>\underparen{abc}</code>
$\overleftrightharpoonup{abc}$	<code>\overleftrightharpoonup{abc}</code>	$\underrightarrow{abc}$	<code>\underrightarrow{abc}</code>
$\overparen{abc}$	<code>\overparen{abc}</code>	$\underightharpoonup{abc}$	<code>\underightharpoonup{abc}</code>
$\overrightarrow{abc}$	<code>\overrightarrow{abc}</code>	$\widetilde{abc}$	<code>\widetilde{abc}</code>
$\overrightharpoonup{abc}$	<code>\overrightharpoonup{abc}</code>	$\widehat{abc}$	<code>\widehat{abc}</code>
$\sqrt{abc}$	<code>\sqrt{abc}</code>	$\widetilde{abc}$	<code>\widetilde{abc}</code>
$\underbrace{abc}$	<code>\underbrace{abc}</code>		

TABLE 277: mathtools Extensible Accents

$\overbrace{abc}$	<code>\overbrace{abc}</code>	$\underline{abc}$	<code>\underbrace{abc}</code>
$\overbracket{abc}$	<code>\overbracket{abc}</code> *	$\underline{abc}$	<code>\underbracket{abc}</code> *

\* `\overbracket` and `\underbracket` accept optional arguments that specify the bracket height and thickness. See the `mathtools` documentation for more information.

TABLE 278: mathabx Extensible Accents

$\overbrace{abc}$	<code>\overbrace{abc}</code>	$\overline{abc}$	<code>\widebar{abc}</code>
$\overgroup{abc}$	<code>\overgroup{abc}</code>	$\widetilde{abc}$	<code>\widecheck{abc}</code>
$\underbrace{abc}$	<code>\underbrace{abc}</code>	$\wideparen{abc}$	<code>\wideparen{abc}</code>
$\undergroup{abc}$	<code>\undergroup{abc}</code>	$\widehat{abc}$	<code>\widering{abc}</code>
$\widearrow{abc}$	<code>\widearrow{abc}</code>		

The braces shown for `\overbrace` and `\underbrace` appear in their minimum size. They can expand arbitrarily wide, however.

TABLE 279: fourier Extensible Accents

$\widehat{abc}$	<code>\widearc{abc}</code>	$\widehat{abc}$	<code>\wideparen{abc}</code>
$\widehat{\rightarrow}abc$	<code>\wideOarc{abc}</code>	$\widehat{\circ}abc$	<code>\widering{abc}</code>

TABLE 280: esvect Extensible Accents

$\overrightarrow{abc}$	<code>\vv{abc}</code> with package option a
$\overrightarrow{abc}$	<code>\vv{abc}</code> with package option b
$\overrightarrow{abc}$	<code>\vv{abc}</code> with package option c
$\overrightarrow{abc}$	<code>\vv{abc}</code> with package option d
$\overrightarrow{abc}$	<code>\vv{abc}</code> with package option e
$\overrightarrow{abc}$	<code>\vv{abc}</code> with package option f
$\overrightarrow{abc}$	<code>\vv{abc}</code> with package option g
$\overrightarrow{abc}$	<code>\vv{abc}</code> with package option h

`esvect` also defines a `\vv*` macro which is used to typeset arrows over vector variables with subscripts. See the `esvect` documentation for more information.



TABLE 281: pdfMsym Extensible Accents

$\overleftarrow{abc}$	<code>\lvecc{abc}</code> *	$\underline{abc}$	<code>\underlvecc{abc}</code>
$\overleftarrow{abc}$	<code>\overleftharp{abc}</code> *	$\underline{abc}$	<code>\underrightharp{abc}</code>
$\overleftarrow{abc}$	<code>\overleftrightharp{abc}</code> *	$\underline{abc}$	<code>\underrightleftharp{abc}</code>
$\overleftrightarrow{abc}$	<code>\overleftrightvecc{abc}</code> *	$\underline{abc}$	<code>\understraightlvecc{abc}</code>
$\overrightarrow{abc}$	<code>\overrightharp{abc}</code> *	$\underline{abc}$	<code>\understraightvecc{abc}</code>
$\overrightarrow{abc}$	<code>\overrightleftharp{abc}</code> *	$\underline{abc}$	<code>\undervecc{abc}</code>
$\overleftarrow{abc}$	<code>\straightlvecc{abc}</code> *	$\widetilde{abc}$	<code>\varwidecheck{abc}</code>
$\overrightarrow{abc}$	<code>\straightvecc{abc}</code> *	$\widehat{abc}$	<code>\varwidehat{abc}</code>
$\underline{abc}$	<code>\underleftharp{abc}</code>	$\widetilde{abc}$	<code>\varwidetilde{abc}</code>
$\underline{abc}$	<code>\underleftrightharp{abc}</code>	$\overrightarrow{abc}$	<code>\vecc{abc}</code> *
$\underline{abc}$	<code>\underleftrightvecc{abc}</code>		

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

\* The `\constvec` command takes one of these vector commands and its argument and typesets the accent at  $x$  height, truncating everything above it. Hence, while `\overleftharp{abcMxyz}` produces “ $\overleftarrow{abcMxyz}$ ”, `\constvec{\overleftharp}{abcMxyz}` produces “ $\overleftarrow{abcMxyz}$ ”.

TABLE 282: overarrows Extensible Accents

$\overline{abc}$	<code>\overbar{abc}</code>	$\underline{abc}$	<code>\underbar{abc}</code>
$\overleftarrow{abc}$	<code>\overleftarrow{abc}</code>	$\underline{\leftarrow{abc}}$	<code>\underleftarrow{abc}</code>
$\overleftarrow{\downarrow}abc$	<code>\overleftarrow{\downarrow}abc</code>	$\underline{\leftarrow{\downarrow}abc}$	<code>\underleftarrow{\downarrow}abc</code>
$\overleftarrow{\uparrow}abc$	<code>\overleftarrow{\uparrow}abc</code>	$\underline{\leftarrow{\uparrow}abc}$	<code>\underleftarrow{\uparrow}abc</code>
$\overleftrightarrow{abc}$	<code>\overleftrightarrow{abc}</code>	$\underline{\leftrightarrow{abc}}$	<code>\underleftrightarrow{abc}</code>
$\overrightarrow{abc}$	<code>\overrightarrow{abc}</code>	$\underline{\rightarrow{abc}}$	<code>\underrightarrow{abc}</code>
$\overrightarrow{\downarrow}abc$	<code>\overrightarrow{\downarrow}abc</code>	$\underline{\rightarrow{\downarrow}abc}$	<code>\underrightarrow{\downarrow}abc</code>
$\overrightarrow{\uparrow}abc$	<code>\overrightarrow{\uparrow}abc</code>	$\underline{\rightarrow{\uparrow}abc}$	<code>\underrightarrow{\uparrow}abc</code>

`overarrows` is extremely customizable. Virtually all aspects of arrows—length, thickness, position, scale, arrowhead style, etc.—can be modified, and new extensible arrows can be constructed. See the `overarrows` documentation for more information. For example, the documentation shows how to create extensible arrows like the following:

$\overleftrightarrow{\curvearrowleft}abc$  `\overarchedleftrightarrow{abc}`      $\overrightarrow{abc}$  `\overbandedarrow{abc}`

TABLE 283: abrates Extensible Accents

$\overbrace{abc}$  `\aoverbrace{abc}`      $\underbrace{abc}$  `\aunderbrace{abc}`

`\aoverbrace` and `\aunderbrace` accept optional arguments that provide a great deal of control over the braces' appearance. For example, these commands can produce braces with asymmetric endpoints, braces that span lines, dashed braces, and multicolored braces. See the `abrates` documentation for more information.

TABLE 284: undertilde Extensible Accents

$\underset{\sim}{abc}$  `\utilde{abc}`

Because `\utilde` is based on `\widetilde` it is also made more extensible by the `yhmath` package (Table 272).

TABLE 285: ushort Extensible Accents

$$\underline{abc} \quad \backslash\text{shortdw}\{abc\} \quad \underline{abc} \quad \backslash\text{shortw}\{abc\}$$

`\shortw` and `\shortdw` are intended to be used with multi-character arguments (“words”) while `\shortand` and `\shortd` are intended to be used with single-character arguments.

The underlines produced by the `ushort` commands are shorter than those produced by the `\underline` command. Consider the output from the expression “`\short{x}\short{y}\underline{x}\underline{y}`”, which looks like “xyxy”.

TABLE 286: mdwmath Extensible Accents

$$\sqrt{abc} \quad \backslash\text{sqrt*}\{abc\}$$

TABLE 287: actuarialangle Extensible Accents

$$\overline{abc} \quad \backslash\text{actuarialangle}\{abc\}$$

The `actuarialangle` package additionally defines `\angl` as `\actuarialangle` with a small amount of extra space to the right of the accented expression under the  $\overline{\phantom{x}}$ , `\angln` as `\angl{n}`, and `\anglr` as `\angl{r}`.

TABLE 288:  $\mathcal{AMS}$  Extensible Arrows
$$\overleftarrow{abc} \quad \backslash\text{xleftarrow}\{abc\} \quad \overrightarrow{abc} \quad \backslash\text{xrightarrow}\{abc\}$$

TABLE 289: mathtools Extensible Arrows

$$\begin{array}{ll} \overleftarrow{abc} & \backslash\text{xhookleftarrow}\{abc\} & \overleftarrow{abc} & \backslash\text{xleftrightharpoons}\{abc\} \\ \overrightarrow{abc} & \backslash\text{xhookrightarrow}\{abc\} & \overmapsto{abc} & \backslash\text{xmapsto}\{abc\} \\ \overleftarrow{abc} & \backslash\text{xLeftarrow}\{abc\} & \overrightarrow{abc} & \backslash\text{xrightarrow}\{abc\} \\ \overleftarrow{abc} & \backslash\text{xleftharpoondown}\{abc\} & \overrightarrow{abc} & \backslash\text{xrightharpoondown}\{abc\} \\ \overleftarrow{abc} & \backslash\text{xleftharpoonup}\{abc\} & \overrightarrow{abc} & \backslash\text{xrightharpoonup}\{abc\} \\ \overleftarrow{abc} & \backslash\text{xleftrightharpoonup}\{abc\} & \overleftarrow{abc} & \backslash\text{xrightleftharpoons}\{abc\} \\ \overleftrightarrow{abc} & \backslash\text{xLeftrightarrow}\{abc\} & & \end{array}$$

TABLE 290: chemarr Extensible Arrows

$$\xleftarrow{abc} \quad \backslash\text{rightleftharpoons}\{abc\}$$

TABLE 291: chemarrow Extensible Arrows

$\xleftarrow{abc}$ def	$\backslash\text{autoleftarrow}\{abc\}\{def\}$	$\xrightarrow{abc}$ def	$\backslash\text{autorightarrow}\{abc\}\{def\}$
$\xleftrightarrow{abc}$ def	$\backslash\text{autoleftrightharpoons}\{abc\}\{def\}$	$\xleftarrow{abc}$ def	$\backslash\text{autorightleftharpoons}\{abc\}\{def\}$

In addition to the symbols shown above, chemarrow also provides  $\backslash\text{arrowfill}$ ,  $\backslash\text{rarrowfill}$ ,  $\backslash\text{leftrightharpoonsfill}$ , and  $\backslash\text{rightleftharpoonsfill}$  macros. Each of these takes a length argument and produces an arrow of the specified length.

TABLE 292: extarrows Extensible Arrows

$\xleftrightarrow{abc}$	$\backslash\text{xLeftrightarrow}\{abc\}$	$\xleftrightarrow{abc}$	$\backslash\text{xLongleftrightarrow}\{abc\}$
$\xleftarrow{abc}$	$\backslash\text{xleftarrow}\{abc\}$	$\xleftarrow{abc}$	$\backslash\text{xlongleftarrow}\{abc\}$
$\xlongequal{abc}$	$\backslash\text{xlongequal}\{abc\}$	$\xrightarrow{abc}$	$\backslash\text{xLongrightarrow}\{abc\}$
$\xleftarrow{abc}$	$\backslash\text{xLongleftarrow}\{abc\}$	$\xrightarrow{abc}$	$\backslash\text{xlongrightarrow}\{abc\}$
$\xleftarrow{abc}$	$\backslash\text{xlongleftarrow}\{abc\}$		

TABLE 293: pdfMsym Extensible Arrows

$\xleftarrow{\circ abc}$	<code>\xvarCircleleftarrow{abc}</code>	$\xleftrightarrow{abc}$	<code>\xvarLleftRrightarrow{abc}</code>
$\xleftarrow{\circ abc}$	<code>\xvarcircleleftarrow{abc}</code>	$\xleftarrow{abc}$	<code>\xvarmapsfrom{abc}</code>
$\xrightarrow{\circ abc}$	<code>\xvarCirclerightarrow{abc}</code>	$\xrightarrow{abc}$	<code>\xvarmapsto{abc}</code>
$\xrightarrow{\circ abc}$	<code>\xvarcirclerightarrow{abc}</code>	$\xleftrightarrow{abc}$	<code>\xvarRibbonleftarrow{abc}</code>
$\xleftarrow{\circ abc}$	<code>\xvardoubleleftarrow{abc}</code>	$\xrightarrow{abc}$	<code>\xvarRibbonrightarrow{abc}</code>
$\xrightarrow{\circ abc}$	<code>\xvardoublerightarrow{abc}</code>	$\xrightarrow{abc}$	<code>\xvarRightarrow{abc}</code>
$\xleftarrow{abc}$	<code>\xvardownhookleftarrow{abc}</code>	$\xrightarrow{abc}$	<code>\xvarrightarrow{abc}</code>
$\xrightarrow{abc}$	<code>\xvardownhookrightarrow{abc}</code>	$\xrightarrow{abc}$	<code>\xvarrightarrow{abc}</code>
$\xleftarrow{abc}$	<code>\xvarleftarrow{abc}</code>	$\xleftarrow{abc}$	<code>\xvarleftarrow{abc}</code>
$\xleftarrow{abc}$	<code>\xvarLeftarrow{abc}</code>	$\xrightarrow{abc}$	<code>\xvarrightarrow{abc}</code>
$\xrightarrow{abc}$	<code>\xvarleftarrows{abc}</code>	$\xleftarrow{abc}$	<code>\xvarSquareleftarrow{abc}</code>
$\xleftarrow{abc}$	<code>\xvarleftrightarrow{abc}</code>	$\xrightarrow{abc}$	<code>\xvarSquarerightarrow{abc}</code>
$\xleftrightarrow{abc}$	<code>\xvarleftrightarrows{abc}</code>	$\xleftarrow{abc}$	<code>\xvaruphookleftarrow{abc}</code>
$\xleftrightarrow{abc}$	<code>\xvarLleftarrow{abc}</code>	$\xrightarrow{abc}$	<code>\xvaruphookrightarrow{abc}</code>

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

TABLE 294: extpfeil Extensible Arrows

$\xlongequal{abc}$	<code>\xlongequal{abc}</code>	$\xleftarrow{abc}$	<code>\xtwoheadleftarrow{abc}</code>
$\xmapsto{abc}$	<code>\xmapsto{abc}</code>	$\xrightarrow{abc}$	<code>\xtwoheadrightarrow{abc}</code>
$\xleftrightarrow{abc}$	<code>\xtofrom{abc}</code>		

The extpfeil package also provides a `\newextarrow` command to help you define your own extensible arrow symbols. See the extpfeil documentation for more information.

TABLE 295: DotArrow Extensible Arrows

$\xrightarrow{\cdot a}$	<code>\dotarrow{a}</code>
-------------------------	---------------------------

The DotArrow package provides mechanisms for lengthening the arrow, adjusting the distance between the arrow and its symbol, and altering the arrowhead. See the DotArrow documentation for more information.

TABLE 296: halloweenmath Extensible Arrows

$\overleftarrow{abc}$	<code>\overscriptleftarrow{abc}</code>	$\underline{abc}$	<code>\underscriptleftarrow{abc}</code>
$\overleftrightarrow{abc}$	<code>\overscriptleftrightarrow{abc}</code>	$\underline{abc}$	<code>\underscriptleftrightarrow{abc}</code>
$\overrightarrow{abc}$	<code>\overscriptrightarrow{abc}</code>	$\underline{abc}$	<code>\underscriptrightarrow{abc}</code>

These commands always typeset the arrow in script (small) style, hence the “script” in their names. Contrast the size of the arrowheads in the following examples (zoomed 3x for clarity):

$$\overrightarrow{abc} \quad \text{vs.} \quad \overscriptrightarrow{abc}$$

`\overrightarrow{abc}`                      `\overscriptrightarrow{abc}`

TABLE 297: pdfMsym Extensible Harpoons

$\xleftarrow{abc}$	<code>\xvarleftharp{abc}</code>	$\xrightarrow{abc}$	<code>\xvarriightharp{abc}</code>
$\overleftarrow{abc}$	<code>\xvarleftrightharp{abc}</code>	$\overrightarrow{abc}$	<code>\xvarrightleftharp{abc}</code>

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfL<sup>A</sup>T<sub>E</sub>X and LuaL<sup>A</sup>T<sub>E</sub>X, some by X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, and none by most other T<sub>E</sub>X backends.

TABLE 298: harpoon Extensible Harpoons

$\overleftarrow{abc}$	<code>\overleftharp{abc}</code>	$\overleftarrow{abc}$	<code>\overrightharpdown{abc}</code>	$\overleftarrow{abc}$	<code>\underrightharp{abc}</code>
$\overleftarrow{abc}$	<code>\overleftharpdown{abc}</code>	$\overleftarrow{abc}$	<code>\underleftharp{abc}</code>	$\overleftarrow{abc}$	<code>\underrightharpdown{abc}</code>
$\overleftarrow{abc}$	<code>\overrightharp{abc}</code>	$\overleftarrow{abc}$	<code>\underleftharpdown{abc}</code>		

All of the harpoon symbols are implemented using the `graphics` package (specifically, `graphics`’s `\resizebox` command). Consequently, only T<sub>E</sub>X backends that support graphical transformations (e.g., *not* Xdvi) can properly display these symbols.

TABLE 299: trfsigns Extensible Transform Symbols

$\overline{abc}$	<code>\dft{abc}</code>	$\overline{abc}$	<code>\DFT{abc}</code>
------------------	------------------------	------------------	------------------------

TABLE 300: esrelation Extensible Relations

$\overleftarrow{abc}$	<code>\relationleftproject{abc}</code>	$\overrightarrow{abc}$	<code>\relationrightproject{abc}</code>
$\underline{abc}$	<code>\relationlifting{abc}</code>		

TABLE 301: halloweenmath Extensible Brooms and Pitchforks

$\overleftarrow{abc}$	<code>\overleftbroom{abc}</code>	$\underrightarrow{abc}$	<code>\underrightbroom{abc}</code>
$\overleftarrow{\pitchfork} abc$	<code>\overleftpitchfork{abc}</code>	$\underrightarrow{\pitchfork} abc$	<code>\underrightpitchfork{abc}</code>
$\overrightarrow{abc}$	<code>\overrightbroom{abc}</code>	$\xleftarrow{abc}$	<code>\xleftbroom{abc}</code>
$\overrightarrow{\pitchfork} abc$	<code>\overrightpitchfork{abc}</code>	$\xleftarrow{\pitchfork} abc$	<code>\xleftpitchfork{abc}</code>
$\underleftarrow{abc}$	<code>\underleftbroom{abc}</code>	$\xrightarrow{abc}$	<code>\xrightbroom{abc}</code>
$\underleftarrow{\pitchfork} abc$	<code>\underleftpitchfork{abc}</code>	$\xrightarrow{\pitchfork} abc$	<code>\xrightpitchfork{abc}</code>

TABLE 302: halloweenmath Extensible Witches

 $abc$	<code>\overleftwitchonbroom{abc}</code>	 $abc$	<code>\underrightwitchonbroom{abc}</code>
 $abc$	<code>\overleftwitchonbroom*{abc}</code>	 $abc$	<code>\underrightwitchonbroom*{abc}</code>
 $abc$	<code>\overleftwitchonpitchfork*{abc}</code>	 $abc$	<code>\underrightwitchonpitchfork*{abc}</code>
 $abc$	<code>\overleftwitchonpitchfork{abc}</code>	 $abc$	<code>\underrightwitchonpitchfork{abc}</code>
 $abc$	<code>\overrightwitchonbroom*{abc}</code>	 $abc$	<code>\xleftwitchonbroom*{abc}</code>
 $abc$	<code>\overrightwitchonbroom{abc}</code>	 $abc$	<code>\xleftwitchonbroom{abc}</code>
 $abc$	<code>\overrightwitchonpitchfork*{abc}</code>	 $abc$	<code>\xleftwitchonpitchfork*{abc}</code>
 $abc$	<code>\overrightwitchonpitchfork{abc}</code>	 $abc$	<code>\xleftwitchonpitchfork{abc}</code>
 $abc$	<code>\underleftwitchonbroom{abc}</code>	 $abc$	<code>\xrightwitchonbroom{abc}</code>
 $abc$	<code>\underleftwitchonbroom*{abc}</code>	 $abc$	<code>\xrightwitchonbroom*{abc}</code>
 $abc$	<code>\underleftwitchonpitchfork*{abc}</code>	 $abc$	<code>\xrightwitchonpitchfork{abc}</code>
 $abc$	<code>\underleftwitchonpitchfork{abc}</code>	 $abc$	<code>\xrightwitchonpitchfork*{abc}</code>

TABLE 303: halloweenmath Extensible Ghosts







 $abc$	<code>\overleftswishingghost{abc}</code>	 $abc$	<code>\overrightswishingghost{abc}</code>
 $abc$	<code>\underleftswishingghost{abc}</code>	 $abc$	<code>\underrightswishingghost{abc}</code>
 $abc$	<code>\xleftswishingghost{abc}</code>	 $abc$	<code>\xrightswishingghost{abc}</code>

TABLE 304: halloweenmath Extensible Bats







 $abc$	<code>\overleftflutteringbat{abc}</code>	 $abc$	<code>\overrightflutteringbat{abc}</code>
 $abc$	<code>\underleftflutteringbat{abc}</code>	 $abc$	<code>\underrightflutteringbat{abc}</code>
 $abc$	<code>\xleftflutteringbat{abc}</code>	 $abc$	<code>\xrightflutteringbat{abc}</code>



TABLE 305: holtpolt Non-commutative Division Symbols

$\left  \frac{abc}{def} \right $	<code>\holter{abc}{def}</code>	$\left  \frac{abc}{def} \right $	<code>\polter{abc}{def}</code>
----------------------------------	--------------------------------	----------------------------------	--------------------------------

TABLE 306: Dots

<code>\cdotp</code>	:	<code>\colon*</code>	<code>\ldotp</code>	<code>\vdots†</code>
<code>\cdots</code>	<code>\ddots†</code>	<code>\ldots</code>		

\* While “:” is valid in math mode, `\colon` uses different surrounding spacing. See Section 12.4 and the Short Math Guide for L<sup>A</sup>T<sub>E</sub>X [Dow00] for more information on math-mode spacing.

† The `mathdots` package redefines `\ddots` and `\vdots` (Table 312) to make them scale properly with font size. (They normally scale horizontally but not vertically.) `\fixedddots` and `\fixedvdots` provide the original, fixed-height functionality of L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>'s `\ddots` and `\vdots` macros.

TABLE 307:  $\mathcal{AMS}$  Dots

<code>\because*</code>	<code>\dotsi</code>	<code>\therefore*</code>
<code>\dotsb</code>	<code>\dotsm</code>	
<code>\dotsc</code>	<code>\dotso</code>	

\* `\because` and `\therefore` are defined as binary relations and therefore also appear in Table 99 on page 68.

The  $\mathcal{AMS}$  `\dots_` symbols are named according to their intended usage: `\dotsb` between pairs of binary operators/relations, `\dotsc` between pairs of commas, `\dotsi` between pairs of integrals, `\dotsm` between pairs of multiplication signs, and `\dotso` between other symbol pairs.

TABLE 308: wasysym Dots

<code>\wasytherefore</code>
-----------------------------

TABLE 309: MnSymbol Dots

$\cdot$	<code>\cdot</code>	$\cdots$	<code>\hdotdot</code>	$\therefore$	<code>\udots</code>
$\ddot{\cdot}$	<code>\ddotdotdot</code>	$\dots$	<code>\hdots</code>	$\uptherefore$	<code>\uptherefore</code>
$\ddots$	<code>\ddots</code>	$\leftthreofore$	<code>\leftthreofore</code>	$\vdots$	<code>\vdotdot</code>
$\diamond\ddots$	<code>\diamonddots</code>	$\rightthreofore$	<code>\rightthreofore</code>	$\vdots$	<code>\vdots</code>
$\downtherefore$	<code>\downtherefore</code>	$\squaredots$	<code>\squaredots</code>		
$\fivedots$	<code>\fivedots</code>	$\udotdot$	<code>\udotdot</code>		

MnSymbol defines `\therefore` as `\uptherefore` and `\because` as `\downtherefore`. Furthermore, `\cdotp` and `\coloneq` produce the same glyphs as `\cdot` and `\vdotdot` respectively but serve as T<sub>E</sub>X math punctuation (class 6 symbols) instead of T<sub>E</sub>X binary operators (class 2).

All of the above except `\hdots` and `\vdots` are defined as binary operators and therefore also appear in Table 59 on page 39.

TABLE 310: fdsymbol Dots

$\cdot$	<code>\cdot</code>	$\dots$	<code>\hdots</code>	$\therefore$	<code>\udots</code>
$\ddot{\cdot}$	<code>\ddotdotdot</code>	$\leftthreofore$	<code>\leftthreofore</code>	$\uptherefore$	<code>\uptherefore</code>
$\ddots$	<code>\ddots</code>	$\rightthreofore$	<code>\rightthreofore</code>	$\vdots$	<code>\vdotdot</code>
$\downtherefore$	<code>\downtherefore</code>	$\squaredots$	<code>\squaredots</code>		
$\hdotdot$	<code>\hdotdot</code>	$\udotdot$	<code>\udotdot</code>		

fdsymbol defines `\adots` as a synonym for `\udots`; `\because` as a synonym for `\downtherefore`; `\cdotp` as a synonym for `\cdot`; `\cdots` as a synonym for `\hdots`; `\Colon` as a synonym for `\squaredots`; `\colon`, `\mathcolon`, and `\mathratio` as synonyms for `\vdotdot`; and `\therefore` as a synonym for `\uptherefore`. (Some of these serve different mathematical roles, such as relations versus binary operators.)

TABLE 311: stix Dots

$\adots$	<code>\adots</code>	$\cdots$	<code>\cdots</code>	$\fourvdots$	<code>\fourvdots</code>
$\because$	<code>\because</code>	$\Colon$	<code>\Colon</code>	$\ldotp$	<code>\ldotp</code>
$\cdot$	<code>\cdot</code>	$\ddots$	<code>\ddots</code>	$\mathellipsis$	<code>\mathellipsis</code>
$\cdotp$	<code>\cdotp</code>	$\enleadertwodots$	<code>\enleadertwodots</code>	$\therefore$	<code>\therefore</code>

stix defines `\centerdot` as a synonym for `\cdotp` and `\dotsb` and `\dotsm` as synonyms for `\cdots`.

TABLE 312: mathdots Dots

$$\ddots \quad \backslash\ddots \quad \iddots \quad \dot{\vdots} \quad \backslash\vdots$$

Unlike the default definitions of the above (Table 306), `mathdots`'s commands are designed to scale properly with the surrounding font size.

TABLE 313: yhmath Dots

$$\adots \quad \backslash\adots$$

TABLE 314: teubner Dots

$$\: \quad \backslash: \quad \dot{\:} \quad \backslash; \quad \dot{\dot{\:}} \quad \backslash? \quad \ddot{\:} \quad \backslash\antilabe$$

TABLE 315: logix Dots

$$\cdot \quad \backslash\text{BndDot} \quad : \quad \backslash\text{Cln} \quad \dots \quad \backslash\text{LDots} \quad \therefore \quad \backslash\text{Thus}$$

$$\dots \quad \backslash\text{CDots} \quad \cdot \quad \backslash\text{Dt} \quad \because \quad \backslash\text{Since} \quad \vdots \quad \backslash\text{VDots}$$

`logix` requires either `Lua $\LaTeX$`  or `X $\LaTeX$` .

TABLE 316: `begriff` Begriffsschrift Symbols
$$\vdash \quad \backslash\text{BGassert} \quad - \quad \backslash\text{BGcontent} \quad \mp \quad \backslash\text{BGnot}$$

$$\left[ \begin{array}{l} b \\ a \end{array} \right. \quad \backslash\text{BGconditional}\{a\}\{b\} \quad \underbrace{a} \quad \backslash\text{BGquant}\{a\}$$

The `begriff` package contains additional commands for typesetting Frege's Begriffsschrift notation for second-order logic. See the `begriff` documentation for more information.

TABLE 317: frege Begriffsschrift Symbols

$\vdash$	<code>\Facontent</code>	$\vdash\pi$	<code>\Fanncontent</code>	$\vdash\pi$	<code>\Fncontent</code>
$\vdash\pi$	<code>\Fancontent</code>	$\vdash$	<code>\Fcontent</code>	$\vdash\pi$	<code>\Fnncontent</code>
$\vdash\overset{a}{\cup}$	<code>\Fannquant{a}</code>	$\vdash\overset{a}{\cup}$	<code>\Faquant{a}</code>	$\vdash\overset{a}{\cup}$	<code>\Fnquant{a}</code>
$\vdash\overset{a}{\cup}\pi$	<code>\Fannquantn{a}</code>	$\vdash\overset{a}{\cup}\pi$	<code>\Faquantn{a}</code>	$\vdash\overset{a}{\cup}\pi$	<code>\Fnquantn{a}</code>
$\vdash\overset{a}{\cup}\pi\pi$	<code>\Fannquantnn{a}</code>	$\vdash\overset{a}{\cup}\pi\pi$	<code>\Faquantnn{a}</code>	$\vdash\overset{a}{\cup}\pi\pi$	<code>\Fnquantnn{a}</code>
$\vdash\overset{a}{\cup}$	<code>\Fanquant{a}</code>	$\pi\overset{a}{\cup}$	<code>\Fnnquant{a}</code>	$\overset{a}{\cup}\pi$	<code>\Fquant{a}</code>
$\vdash\overset{a}{\cup}\pi$	<code>\Fanquantn{a}</code>	$\pi\overset{a}{\cup}\pi$	<code>\Fnnquantn{a}</code>	$\overset{a}{\cup}\pi$	<code>\Fquantn{a}</code>
$\vdash\overset{a}{\cup}\pi\pi$	<code>\Fanquantnn{a}</code>	$\pi\overset{a}{\cup}\pi\pi$	<code>\Fnnquantnn{a}</code>	$\overset{a}{\cup}\pi\pi$	<code>\Fquantnn{a}</code>

The `frege` package contains additional commands for typesetting Frege’s Begriffsschrift notation for second-order logic. See the `frege` documentation for more information.

TABLE 318: mathcomp Math Symbols

$^{\circ}\text{C}$	<code>\tccentigrade</code>	$\Omega$	<code>\tcohm</code>	$\text{‰}$	<code>\tcpertousand</code>
$\mu$	<code>\tcmu</code>	$\text{‰‰}$	<code>\tcpertenthousand</code>		

TABLE 319: marvosym Math Symbols

$\sphericalangle$	<code>\AngleSign</code>	$\geq$	<code>\LargerOrEqual</code>	$\times$	<code>\MVMultiplication</code>
$\Rightarrow$	<code>\Conclusion</code>	$\leq$	<code>\LessOrEqual</code>	$\cdot$	<code>\MVPeriod</code>
$\equiv$	<code>\Congruent</code>	$\cdot$	<code>\MultiplicationDot</code>	$+$	<code>\MVPlus</code>
$\cong$	<code>\Corresponds</code>	$,$	<code>\MVComma</code>	$\rightarrow$	<code>\MVRightArrow</code>
$\div$	<code>\Divides</code>	$/$	<code>\MVDivision</code>	$)$	<code>\MVRightBracket</code>
$\nmid$	<code>\DividesNot</code>	$($	<code>\MVLeftBracket</code>	$\neq$	<code>\NotCongruent</code>
$\Leftrightarrow$	<code>\Equivalence</code>	$-$	<code>\MVMinus</code>		

TABLE 320: marvosym Digits

0	<code>\MVZero</code>	2	<code>\MVTwo</code>	4	<code>\MVFfour</code>	6	<code>\MVSix</code>	8	<code>\MVEight</code>
1	<code>\MVOne</code>	3	<code>\MVThree</code>	5	<code>\MVFfive</code>	7	<code>\MVSeven</code>	9	<code>\MVNine</code>

TABLE 321: fge Digits

$\text{ƒ}$	<code>\fgeleftthree</code>	$\text{ƒ}$	<code>\fgerighttwo</code>	$\text{0}$	<code>\fgestruckzero</code>
$\text{ƒ}$	<code>\fgelefttwo</code>	$\text{1}$	<code>\fgestruckone</code>		

TABLE 322: dozenal Base-12 Digits

$\zeta$	<code>\x</code>	$\xi$	<code>\e</code>
---------	-----------------	-------	-----------------

TABLE 323: mathabx Mayan Digits

$\textcircled{0}$	<code>\maya{0}</code>	:	<code>\maya{2}</code>	:	<code>\maya{4}</code>
$\cdot$	<code>\maya{1}</code>	:	<code>\maya{3}</code>	:	<code>\maya{5}</code>

TABLE 324: stix Infinities

$\textcircled{\infty}$	<code>\acidfree</code>	$\infty$	<code>\infty</code>	$\textcircled{\infty}$	<code>\tieinfty</code>
$\sim$	<code>\iinfin</code>	$\phi$	<code>\nvinfty</code>		

TABLE 325: stix Primes

$'$	<code>\prime</code>	$\backslash$	<code>\backprime</code>
$''$	<code>\dprime</code>	$\backslash\backslash$	<code>\backdprime</code>
$'''$	<code>\trprime</code>	$\backslash\backslash\backslash$	<code>\backtrprime</code>
$''''$	<code>\qprime</code>		

TABLE 326: stix Empty Sets

$\emptyset$	<code>\emptyset</code>	$\overline{\emptyset}$	<code>\emptysetbar</code>	$\emptyset$	<code>\varnothing</code>
$\overline{\emptyset}$	<code>\emptysetoarr</code>	$\emptyset$	<code>\emptysetocirc</code>		
$\overline{\emptyset}$	<code>\emptysetoarrl</code>	$\emptyset$	<code>\revemptyset</code>		

TABLE 327:  $\mathcal{AMS}$  Angles

$\angle$	<code>\angle</code>	$\sphericalangle$	<code>\measuredangle</code>	$\sphericalangle$	<code>\sphericalangle</code>
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TABLE 328: MnSymbol Angles

$\sphericalangle$	<code>\angle</code>	$\sphericalangle$	<code>\measuredangle</code>	$\sphericalangle$	<code>\sphericalangle</code>
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TABLE 329: fdsymbol Angles

$\sphericalangle$	<code>\angle</code>	$\sphericalangle$	<code>\revangle</code>	$\sphericalangle$	<code>\sphericalangle</code>
$\sphericalangle$	<code>\measuredangle</code>	$\sphericalangle$	<code>\revmeasuredangle</code>	$\sphericalangle$	<code>\sphericalangledown</code>
$\sphericalangle$	<code>\measuredrightangle</code>	$\sphericalangle$	<code>\rightangle</code>	$\sphericalangle$	<code>\sphericalangleleft</code>
$\sphericalangle$	<code>\measuredrightangledot</code>	$\sphericalangle$	<code>\rightanglesquare</code>	$\sphericalangle$	<code>\sphericalangleup</code>

fdsymbol defines `\measuredangleleft` as a synonym for `\revmeasuredangle`; `\revsphericalangle` and `\gtlpar` as synonyms for `\sphericalangleleft`; `\rightanglesqr` as a synonym for `\rightanglesquare`; and `\rightangledot` as a synonym for `\measuredrightangledot`.

TABLE 330: boisik Angles

$\sphericalangle$	<code>\angle</code>	$\sphericalangle$	<code>\rightangle</code>	$\sphericalangle$	<code>\sphericalangle</code>
$\sphericalangle$	<code>\measuredangle</code>	$\sphericalangle$	<code>\rightangledot</code>		
$\sphericalangle$	<code>\measuredrightangle</code>	$\sphericalangle$	<code>\rightanglesqr</code>		

TABLE 331: stix Angles

$\sphericalangle$	<code>\angdnr</code>	$\sphericalangle$	<code>\measanglerutone</code>	$\sphericalangle$	<code>\rightangledot</code>
$\sphericalangle$	<code>\angle</code>	$\sphericalangle$	<code>\measangleltonw</code>	$\sphericalangle$	<code>\rightanglesqr</code>
$\sphericalangle$	<code>\angles</code>	$\sphericalangle$	<code>\measangleurtone</code>	$\sphericalangle$	<code>\sphericalangle</code>
$\sphericalangle$	<code>\angleubar</code>	$\sphericalangle$	<code>\measuredangle</code>	$\sphericalangle$	<code>\sphericalangleup</code>
$\sphericalangle$	<code>\gtlpar</code>	$\sphericalangle$	<code>\measuredangleleft</code>	$\sphericalangle$	<code>\threeangle</code>
$\sphericalangle$	<code>\measangledtosw</code>	$\sphericalangle$	<code>\measuredrightangle</code>	$\sphericalangle$	<code>\turnangle</code>
$\sphericalangle$	<code>\measangledrtose</code>	$\sphericalangle$	<code>\rangledownzigzagarrow</code>	$\sphericalangle$	<code>\wideangledown</code>
$\sphericalangle$	<code>\measangleldtosw</code>	$\sphericalangle$	<code>\revangle</code>	$\sphericalangle$	<code>\wideangleup</code>
$\sphericalangle$	<code>\measangleltonw</code>	$\sphericalangle$	<code>\revangleubar</code>		
$\sphericalangle$	<code>\measanglerdtose</code>	$\sphericalangle$	<code>\rightangle</code>		

TABLE 332: typicons Decorative Mathematical Symbols

$\div$	<code>\tiDivide</code>	$\infty$	<code>\tiInfinity</code>	$\pi$	<code>\tiPi</code>
$\div$	<code>\tiDivideOutline</code>	$\infty$	<code>\tiInfinityOutline</code>	$+$	<code>\tiPlus</code>
$=$	<code>\tiEquals</code>	$-$	<code>\tiMinus</code>	$+$	<code>\tiPlusOutline</code>
$=$	<code>\tiEqualsOutline</code>	$-$	<code>\tiMinusOutline</code>		

See also `\tiTimes` ( $\times$ ) and `\tiTimesOutline` ( $\otimes$ ) in Table 422. All typicons symbols are intended to be used in text mode, not math mode.

typicons requires either Lua<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 333: fontawesome5 Decorative Mathematical Symbols

$\div$	<code>\faDivide</code>	$<$	<code>\faLessThan</code>	$\%$	<code>\faPercentage</code>
$=$	<code>\faEquals</code>	$\leq$	<code>\faLessThanEqual</code>	$+$	<code>\faPlus</code>
$>$	<code>\faGreaterThan</code>	$-$	<code>\faMinus</code>	$?$	<code>\faQuestion</code>
$\geq$	<code>\faGreaterThanEqual</code>	$\neq$	<code>\faNotEqual</code>		
$\infty$	<code>\faInfinity</code>	$\%$	<code>\faPercent</code>		

See also `\faTimes` ( $\times$ ) in Table 423. All fontawesome5 symbols are intended to be used in text mode, not math mode.

TABLE 334: Miscellaneous L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Math Symbols

$\aleph$	<code>\aleph</code>	$\square$	<code>\Box<sup>*,†</sup></code>	$\nabla$	<code>\nabla</code>	$\triangle$	<code>\triangle</code>
$\emptyset$	<code>\emptyset<sup>‡</sup></code>	$\diamond$	<code>\Diamond<sup>*</sup></code>	$\neg$	<code>\neg</code>		
$\angle$	<code>\angle</code>	$\infty$	<code>\infty</code>	$\prime$	<code>\prime</code>		
$\backslash$	<code>\backslash</code>	$\mho$	<code>\mho<sup>*</sup></code>	$\surd$	<code>\surd</code>		

\* Not predefined in L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>. Use one of the packages `latexsym`, `amssymb`, `amssymb`, `txfonts`, `pxfonts`, or `wasysym`. Note, however, that `amssymb` and `amssymb` define `\Diamond` to produce the same glyph as `\lozenge` (“ $\diamond$ ”); the other packages produce a squarer `\Diamond` as depicted above.

† To use `\Box`—or any other symbol—as an end-of-proof (Q.E.D.) marker, consider using the `ntheorem` package, which properly juxtaposes a symbol with the end of the proof text.

‡ Many people prefer the look of  $\mathcal{A}\mathcal{M}\mathcal{S}$ ’s `\varnothing` (“ $\emptyset$ ”, Table 335) to that of L<sup>A</sup>T<sub>E</sub>X’s `\emptyset`.

TABLE 335: Miscellaneous  $\mathcal{A}\mathcal{M}\mathcal{S}$  Math Symbols

$\backslash$	<code>\backprime</code>	$\blacktriangledown$	<code>\blacktriangledown</code>	$\mho$	<code>\mho</code>
$\star$	<code>\bigstar</code>	$\diagdown$	<code>\diagdown</code>	$\square$	<code>\square</code>
$\blacklozenge$	<code>\blacklozenge</code>	$\diagup$	<code>\diagup</code>	$\blacktriangledown$	<code>\triangledown</code>
$\blacksquare$	<code>\blacksquare</code>	$\eth$	<code>\eth</code>	$\varnothing$	<code>\varnothing</code>
$\blacktriangle$	<code>\blacktriangle</code>	$\lozenge$	<code>\lozenge</code>	$\vartriangle$	<code>\vartriangle</code>

TABLE 336: Miscellaneous wasysym Math Symbols

$\square$	<code>\Box</code>	$\diamond$	<code>\Diamond</code>	$\mho$	<code>\mho<sup>*</sup></code>	$\vartriangleleft$	<code>\varangle</code>
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\* `wasysym` also defines an `\agem0` symbol, which is the same glyph as `\mho` but is intended for use in text mode.

TABLE 337: Miscellaneous txfonts/pxfonts Math Symbols

◆	<code>\Diamondblack</code>	λ	<code>\lambdabar</code>
◇	<code>\Diamonddot</code>	λ	<code>\lambdaslash</code>

TABLE 338: Miscellaneous mathabx Math Symbols

◦	<code>\degree</code>	≡	<code>\fourth</code>	∠	<code>\measuredangle</code>	//	<code>\second</code>
\	<code>\diagdown</code>	#	<code>\hash</code>	⌋	<code>\pitchfork</code>	∠	<code>\sphericalangle</code>
/	<code>\diagup</code>	∞	<code>\infty</code>	∝	<code>\propto</code>	≡	<code>\third</code>
∅	<code>\diameter</code>	×	<code>\leftthreetimes</code>	∠	<code>\rightthreetimes</code>	#	<code>\varhash</code>

TABLE 339: Miscellaneous MnSymbol Math Symbols

⊖	<code>\backneg</code>	∅	<code>\diameter</code>	⊖	<code>\invneg</code>	⊖	<code>\neg</code>
\	<code>\backprime</code>	∞	<code>\infty</code>	✱	<code>\maltese</code>	/	<code>\prime</code>
✓	<code>\checkmark</code>	⊖	<code>\invbackneg</code>	∇	<code>\nabla</code>	f	<code>\smallint</code>

MnSymbol defines `\emptyset` and `\varnothing` as synonyms for `\diameter`; `\lnot` and `\minushookdown` as synonyms for `\neg`; `\minushookup` as a synonym for `\invneg`; `\hookdownminus` as a synonym for `\backneg`; and, `\hookupminus` as a synonym for `\invbackneg`.

TABLE 340: Miscellaneous Internal MnSymbol Math Symbols

∂	<code>\partialvardint</code>	∂	<code>\partialvartint</code>
∂	<code>\partialvardlanddownint</code>	∂	<code>\partialvartlanddownint</code>
∂	<code>\partialvardlandupint</code>	∂	<code>\partialvartlandupint</code>
∂	<code>\partialvardlcircleleftint</code>	∂	<code>\partialvartlcircleleftint</code>
∂	<code>\partialvardlcircclerightint</code>	∂	<code>\partialvartlcircclerightint</code>
∂	<code>\partialvardoint</code>	∂	<code>\partialvartoint</code>
∂	<code>\partialvardoint</code>	∂	<code>\partialvartoint</code>
∂	<code>\partialvardrcircleleftint</code>	∂	<code>\partialvartrcircleleftint</code>
∂	<code>\partialvardrcircclerightint</code>	∂	<code>\partialvartrcircclerightint</code>
∂	<code>\partialvardstrokedint</code>	∂	<code>\partialvartstrokedint</code>
∂	<code>\partialvardsumint</code>	∂	<code>\partialvartsumint</code>

These symbols are intended to be used internally by MnSymbol to construct the integrals appearing in Table 87 on page 58 but can nevertheless be used in isolation.



TABLE 341: Miscellaneous fdsymbol Math Symbols

$\neg$	<code>\backneg</code>	$\int$	<code>\intprod</code>	$\prime$	<code>\prime</code>
$\backslash$	<code>\backprime</code>	$\int$	<code>\intprodr</code>	$\emptyset$	<code>\reemptysetset</code>
$\checkmark$	<code>\checkmark</code>	$\neg$	<code>\invneg</code>	$\nabla$	<code>\sector</code>
$\emptyset$	<code>\emptysetset</code>	$\text{✖}$	<code>\maltese</code>	$\int$	<code>\smallint</code>
$\infty$	<code>\infty</code>	$\neg$	<code>\neg</code>		

fdsymbol defines `\hookdownminus`, `\invneg`, and `\invnot` as synonyms for `\backneg`; `\lnot` and `\minushookdown` as synonyms for `\neg`; `\hookupminus` and `\turnedbackneg` as synonyms for `\intprodr`; `\minushookup`, `\turnedneg`, and `\turnednot` as synonyms for `\intprod`; and `\diameter` and `\varnothing` as synonyms for `\emptysetset`.

TABLE 342: Miscellaneous boisik Math Symbols

$\epsilon$	<code>\backepsilon</code>	$\dagger$	<code>\hermitmatrix</code>	$\not\propto$	<code>\notbot</code>
$\backslash$	<code>\backprime</code>	$\infty$	<code>\iinfin</code>	$\not\propto$	<code>\nottop</code>
$\checkmark$	<code>\checkmark</code>	$\neg$	<code>\invnot</code>	$\wr$	<code>\riota</code>
$\square$	<code>\dalambert</code>	$\lambda$	<code>\lambdabar</code>	$\sim$	<code>\sinewave</code>
$\diagdown$	<code>\diagdown</code>	$\lambda$	<code>\lambdaslash</code>	$\emptyset$	<code>\varnothing</code>
$\diagup$	<code>\diagup</code>	$\text{✖}$	<code>\maltese</code>		

TABLE 343: Miscellaneous stix Math Symbols

$\approx$	<code>\accurrent</code>	$\dagger$	<code>\hermitmatrix</code>	$\text{⦶}$	<code>\PropertyLine</code>
$\backslash$	<code>\backslash</code>	$\cdot$	<code>\hyphenbullet</code>	$\blacksquare$	<code>\QED</code>
$\equiv$	<code>\bbrktbrk</code>	$\sim$	<code>\hzigzag</code>	$\text{??}$	<code>\Question</code>
$\perp$	<code>\bigbot</code>	$\Delta$	<code>\increment</code>	$\times$	<code>\rdiagovfdiag</code>
$\equiv$	<code>\biginterleave</code>	$\blacksquare$	<code>\inversebullet</code>	$\text{⋈}$	<code>\rightouterjoin</code>
$\top$	<code>\bigtop</code>	$\neg$	<code>\invnot</code>	$\lrcorner$	<code>\sansLmirrored</code>
$\text{☺}$	<code>\blacksmiley</code>	$\text{⋈}$	<code>\Join</code>	$\lrcorner$	<code>\sansLturned</code>
$\{$	<code>\bracevert</code>	$\square$	<code>\laplac</code>	$\sim$	<code>\sinewave</code>
$\hat{\phantom{x}}$	<code>\caretinsert</code>	$\text{⋈}$	<code>\leftouterjoin</code>	$\text{—}$	<code>\strns</code>
$\checkmark$	<code>\checkmark</code>	$\cup$	<code>\llarc</code>	$\text{⊕}$	<code>\thermod</code>
$\triangleright$	<code>\conictaper</code>	$\cup$	<code>\lrarc</code>	$\text{⌈}$	<code>\topcir</code>
$\text{⚠}$	<code>\danger</code>	$\text{✖}$	<code>\maltese</code>	$\neg$	<code>\turnednot</code>
$\diagdown$	<code>\diagdown</code>	$\text{§}$	<code>\mathsection</code>	$\text{—}$	<code>\ubrbrak</code>
$\diagup$	<code>\diagup</code>	$\text{—}$	<code>\mathvisiblespace</code>	$\cup$	<code>\ularc</code>
$\emptyset$	<code>\diameter</code>	$\nabla$	<code>\nabla</code>	$\cup$	<code>\urarc</code>

(continued on next page)

(continued from previous page)

*	<code>\dingasterisk</code>	¬	<code>\neg*</code>	‡	<code>\viewdata</code>
✕	<code>\elinters</code>	⏟	<code>\obrbrak</code>	⋈	<code>\vzigzag</code>
ø	<code>\eth</code>	⊥	<code>\perps</code>	¥	<code>\yen</code>
!!	<code>\Exclam</code>	〒	<code>\postalmark</code>	§	<code>\zcmp</code>
×	<code>\fdiagovrdiag</code>	⤿	<code>\proflink</code>	≫	<code>\zpipe</code>
⋈	<code>\fullouterjoin</code>	⊃	<code>\profsurf</code>	↓	<code>\zproject</code>

\* stix defines `\lnot` as a synonym for `\neg`.

TABLE 344: Miscellaneous textcomp Text-mode Math Symbols

°	<code>\textdegree*</code>	$\frac{1}{2}$	<code>\textonehalf†</code>	$\frac{3}{4}$	<code>\textthreequarters†</code>
÷	<code>\textdiv</code>	$\frac{1}{4}$	<code>\textonequarter†</code>	<sup>3</sup>	<code>\textthreesuperior</code>
/	<code>\textfractionsolidus</code>	<sup>1</sup>	<code>\textonesuperior</code>	×	<code>\texttimes</code>
¬	<code>\textlnot</code>	±	<code>\textpm</code>	<sup>2</sup>	<code>\texttwosuperior</code>
−	<code>\textminus</code>	√	<code>\textsurd</code>		

\* If you prefer a larger degree symbol you might consider defining one as `\ensuremath{\textcircled{°}}` (“°”).

† `nicefrac` (part of the `units` package) or the newer `xfrac` package can be used to construct vulgar fractions like “1/2”, “1/4”, “3/4”, and even “c/o”.

TABLE 345: Miscellaneous fge Math Symbols

\	<code>\fgebackslash</code>	∧	<code>\fgecap</code>	∩	<code>\fgecupacute</code>	∠	<code>\fgelangle</code>
⊥	<code>\fgebaracute</code>	⊂	<code>\fgecapbar</code>	≅	<code>\fgecupbar</code>	⌊	<code>\fgeupbracket</code>
⊃	<code>\fgebarcap</code>	∪	<code>\fgecup</code>	∞	<code>\fgeinfty</code>		

TABLE 346: Miscellaneous mathdesign Math Symbols

⊥ `\rightangle`

TABLE 347: Miscellaneous logix Math Symbols

$\otimes$	<code>\Aor</code>	$\otimes$	<code>\FncCnvrs</code>	$\sqcup$	<code>\MapJoin</code>	$\cup$	<code>\SetJoin</code>
$\gtplus$	<code>\Append</code>	$\circ$	<code>\FncComp</code>	$\sqcap$	<code>\MapMeet</code>	$\cap$	<code>\SetMeet</code>
$\mathfrak{I}$	<code>\BncBistab</code>	$\bullet$	<code>\ForComp</code>	$\oplus$	<code>\Mnd</code>	$\Delta$	<code>\SetSymDiff</code>
$\sqcup$	<code>\BnchJoin</code>	$\omega$	<code>\FrstOrd</code>	$\wp$	<code>\Mor</code>	$\perp$	<code>\SimPerp</code>
$\sqcap$	<code>\BnchMeet</code>	$\nu$	<code>\GrtFix</code>	$\triangleleft$	<code>\Normal</code>	$\sim$	<code>\SinCoh</code>
$\#$	<code>\Catenate</code>	$\times$	<code>\InCoh</code>	$?$	<code>\OfCrse</code>	$\oplus$	<code>\SmCircPlus</code>
$\tau$	<code>\Choice</code>	$\infty$	<code>\Infin</code>	$\&$	<code>\QuantAAnd</code>	$\otimes$	<code>\SmCircStar</code>
$\mathcal{T}$	<code>\Choices</code>	$\mathfrak{I}$	<code>\LcgBistab</code>	$\sqcup$	<code>\QuantBnchJoin</code>	$\otimes$	<code>\SmCircTimes</code>
$\circ$	<code>\Coh</code>	$\oplus$	<code>\LgCircPlus</code>	$\sqcap$	<code>\QuantBnchMeet</code>	$\downarrow$	<code>\VeeJoin</code>
$\parallel$	<code>\Concat</code>	$\otimes$	<code>\LgCircStar</code>	$\wp$	<code>\QuantMor</code>	$\uparrow$	<code>\VeeMeet</code>
$\prec$	<code>\Cover</code>	$\otimes$	<code>\LgCircTimes</code>	$\cup$	<code>\QuantSetJoin</code>	$!$	<code>\WhyNot</code>
$\vec{\nu}$	<code>\ExGrtFix</code>	$\mu$	<code>\LstFix</code>	$\cap$	<code>\QuantSetMeet</code>		
$\vec{\mu}$	<code>\ExLstFix</code>	$\square$	<code>\MapComp</code>	$\sim$	<code>\SCoh</code>		

logix requires either Lua $\LaTeX$  or Xe $\LaTeX$ .

TABLE 348: Math Alphabets

Font sample	Generating command	T <sub>E</sub> X font	Required package
ABCdef123	<code>\mathrm{ABCdef123}</code>	cmr10	<i>none</i>
<i>ABCdef123</i>	<code>\mathit{ABCdef123}</code>	cmmi10	<i>none</i>
<i>ABCdef123</i>	<code>\mathnormal{ABCdef123}</code>	cmmi10	<i>none</i>
<i>ABC</i>	<code>\mathcal{ABC}</code>	cmsy10	<i>none</i>
<i>ABC</i>	<code>\mathscr{ABC}</code>	rsfs10	mathrsfs
	<i>or</i> <code>\mathcal{ABC}</code>	rsfs10	calrsfs
<i>ABC</i>	<code>\mathcal{ABC}</code>	eusm10	euscript with the <code>mathcal</code> option
	<i>or</i> <code>\mathscr{ABC}</code>	eusm10	euscript with the <code>mathscr</code> option
<i>ABC</i>	<code>\mathcal{ABC}</code>	rsfso10	rsfso
	<i>or</i> <code>\mathscr{ABC}</code>	rsfso10	rsfso with the <code>scr</code> option
<i>ABC</i>	<code>\mathcal{ABC}</code>	urwchancal	urwchancal*
	<i>or</i> <code>\mathscr{ABC}</code>	urwchancal	urwchancal* with the <code>mathscr</code> option
ABC	<code>\mathbb{ABC}</code>	msbm10	amsfonts, <sup>§</sup> amssymb, txfonts, or pxfonts
ABC	<code>\varmathbb{ABC}</code>	txmia	txfonts or pxfonts
ABCdef123	<code>\mathbb{ABCdef123}</code>	bbold10	bbold or mathbbol <sup>†</sup>
ABCdef123	<code>\mathbb{ABCdef123}</code>	mbb10	mbboard <sup>†</sup>
ABCdef12	<code>\mathbbm{ABCdef12}</code>	bbm10	bbm
ABCdef12	<code>\mathbbmss{ABCdef12}</code>	bbmss10	bbm
ABCdef12	<code>\mathbbmmtt{ABCdef12}</code>	bbmmtt10	bbm
ABC1	<code>\mathds{ABC1}</code>	dsrom10	dsfont
ABC1	<code>\mathds{ABC1}</code>	dsss10	dsfont with the <code>sans</code> option
ABCdef123	<code>\mathbb{ABCdef123}</code>	DSSerif	dsserif
<b>ABCdef123</b>	<code>\mathbbb{ABCdef123}</code>	DSSerif-Bold	dsserif
ABC	<code>\symA\symB\symC</code>	china10	ℒ <sub>A</sub> 2e <sup>‡</sup>
<i>ABCdef123</i>	<code>\mathfrak{ABCdef123}</code>	eufm10	eufrak
<i>ABCdef123</i>	<code>\textfrak{ABCdef123}</code>	yfrak	yfonts <sup>¶</sup>
<i>ABCdef123</i>	<code>\textswab{ABCdef123}</code>	yswab	yfonts <sup>¶</sup>
<i>ABCdef123</i>	<code>\textgoth{ABCdef123}</code>	ygoth	yfonts <sup>¶</sup>

The “T<sub>E</sub>X font” column lists the underlying T<sub>E</sub>X font (or, more accurately, the `.tfm` file) that provides the math alphabet. See the corresponding table in the associated Raw Font Tables document for the math alphabet’s complete character set.

\* `urwchancal` redefines `\mathcal` or `\mathscr` to use Zapf Chancery as the calligraphic or script font. However, like all `\mathcal` and `\mathscr` commands shown in Table 348, these support only uppercase letters. An alternative is to put “`\DeclareMathAlphabet{\mathpzc}{OT1}{pzc}{m}{it}`” in your document’s preamble to make `\mathpzc` typeset a wider set of characters in Zapf Chancery. Unfortunately, with this technique accents, superscripts, and subscripts don’t align as well as they do with `urwchancal`.

As a similar trick, you can typeset the Calligra font’s script “*z*” (or other calligraphic symbols) in math mode by loading the `calligra` package and putting “`\DeclareMathAlphabet{\mathcalligra}{T1}{calligra}{m}{n}`” in your document’s preamble to make `\mathcalligra` typeset its argument in the Calligra font. You may also want to specify “`\DeclareFontShape{T1}{calligra}{m}{n}{<->s*[2.2]callig15}{}`” to set Calligra at 2.2 times its design size for a better blend with typical body fonts.

† The `mathbbol` package defines some additional blackboard bold characters: parentheses, square brackets, angle brackets, and—if the `bbgreek` option is passed to `mathbbol`—Greek letters. For instance, “`<[[[αβγ]]>`” is produced by “`\mathbb{\Langle\lbrack\lparen\bbalpha\bbbeta\bbgamma\Rparen\Rbrack\Rangle}`”.

`mbboard` extends the blackboard bold symbol set significantly further. It supports not only the Greek alphabet—including “Greek-like” symbols such as `\bbnabla` (“ $\nabla$ ”)—but also *all* punctuation marks, various currency symbols such as `\bbdollar` (“\$”) and `\bbeuro` (“€”), and the Hebrew alphabet (e.g., “`\bbfinalnun\bbyo\bbqof\bbpe`” → “פןקפ”).

‡ The `\sym...` commands provided by the `GfNA2e` package are actually text-mode commands. They are included in Table 348 because they resemble the blackboard-bold symbols that appear in the rest of the table. In addition to the 26 letters of the English alphabet, `GfNA2e` provides three unlauded blackboard-bold letters: `\symAE` (“ $\text{\AA}$ ”), `\symOE` (“ $\text{\O}$ ”), and `\symUE` (“ $\text{\U}$ ”). Note that `GfNA2e` does provide math-mode commands for the most common number-set symbols. These are presented in Table 207 on page 119.

¶ As their `\text...` names imply, the fonts provided by the `yfonts` package are actually text fonts. They are included in Table 348 because they are frequently used in a mathematical context.

§ An older (i.e., prior to 1991) version of the  $\mathcal{AMS}$ ’s fonts rendered  $\mathbb{C}$ ,  $\mathbb{N}$ ,  $\mathbb{R}$ ,  $\mathbb{S}$ , and  $\mathbb{Z}$  as  $\mathbb{C}$ ,  $\mathbb{N}$ ,  $\mathbb{R}$ ,  $\mathbb{S}$ , and  $\mathbb{Z}$ . As some people prefer the older glyphs—much to the  $\mathcal{AMS}$ ’s surprise—and because those glyphs fail to build under modern versions of METAFONT, Berthold Horn uploaded PostScript fonts for the older blackboard-bold glyphs to CTAN, to the `fonts/msym10` directory. As of this writing, however, there are no  $\text{\LaTeX} 2_{\epsilon}$  packages for utilizing the now-obsolete glyphs.

## Chapter 4

# Science and technology symbols

This chapter lists symbols that are employed in various branches of science and engineering.









TABLE 349: gensymb Symbols Defined to Work in Both Math and Text Mode

°C	<code>\celsius</code>	μ	<code>\micro</code>	‰	<code>\perthousand</code>
°	<code>\degree</code>	Ω	<code>\ohm</code>		

TABLE 350: wasysym Electrical and Physical Symbols

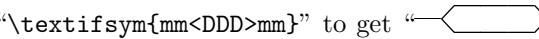
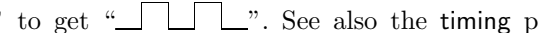
~	<code>\AC</code>	≈	<code>\VHF</code>	~~~~~	<code>\photon</code>	≈	<code>\HF</code>	⊗	<code>\gluon</code>
---	------------------	---	-------------------	-------	----------------------	---	------------------	---	---------------------

TABLE 351: ifsym Pulse Diagram Symbols

	<code>\FallingEdge</code>		<code>\LongPulseLow</code>		<code>\PulseLow</code>		<code>\ShortPulseHigh</code>
	<code>\LongPulseHigh</code>		<code>\PulseHigh</code>		<code>\RaisingEdge</code>		<code>\ShortPulseLow</code>

In addition, within `\textifsym{...}`, the following codes are valid:

<code>_</code>	<code>l</code>	<code>-</code>	<code>m</code>	<code>~</code>	<code>h</code>	<code>⎯</code>	<code>d</code>	<code>&lt;</code>	<code>&lt;</code>	<code>&gt;</code>	<code>&gt;</code>
<code>⎯</code>	<code>L</code>	<code>—</code>	<code>M</code>	<code>⎯</code>	<code>H</code>	<code>⎯</code>	<code>D</code>	<code>&lt;</code>	<code>&lt;&lt;</code>	<code>&gt;</code>	<code>&gt;&gt;</code>

This enables one to write `"\textifsym{mm<DDD>mm}"` to get  or `"\textifsym{L|H|L|H|L}"` to get . See also the `timing` package, which provides a wide variety of pulse-diagram symbols within an environment designed specifically for typesetting pulse diagrams.

Finally, `\textifsym` supports the display of segmented digits, as would appear on an LCD: `"\textifsym{-123.456}"` produces `"- 123.456"`. `"\textifsym{b}"` outputs a blank with the same width as an `"8"`.

TABLE 352: ar Aspect Ratio Symbol

 $\mathcal{R}$  `\AR`

TABLE 353: plimsoll Plimsoll Symbol

 $\ominus$  `\plimsoll`

TABLE 354: textcomp Text-mode Science and Engineering Symbols

 $^{\circ}\text{C}$  `\textcelsius`  $\text{\textohm}$  `\textmho`  $\mu$  `\textmu`  $\Omega$  `\textohm`

TABLE 355: steinmetz Extensible Phasor Symbol

 $\sphericalangle abc$  `\phase{abc}`

The `\phase` command uses the `pict2e` package to draw a horizontally and vertically scalable Steinmetz phasor symbol. Consequently, `\phase` works only with those T<sub>E</sub>X backends supported by `pict2e`. See the `pict2e` documentation for more information.

TABLE 356: emf Electromotive Force Symbols

$\mathcal{E}$  `\emf` with package option `boondox` (default)  
 $\mathcal{E}$  `\emf` with package option `cal`\*  
 $\mathcal{E}$  `\emf` with package option `calligra`  
 $\mathcal{E}$  `\emf` with package option `chorus`  
 $\mathcal{E}$  `\emf` with package option `cmr`  
 $\mathcal{E}$  `\emf` with package option `fourier`  
 $\mathcal{E}$  `\emf` with package option `frursive`  
 $\mathcal{E}$  `\emf` with package option `miami`  
 $\mathcal{E}$  `\emf` with package option `rsfs`

\* With the `cal` package option, `\emf` uses `\mathcal{cal}`. Hence, the depiction of “E” depends on the currently loaded math font.

TABLE 357: wasysym Astronomical Symbols

♿	<code>\mercury</code>	♁	<code>\earth</code>	♃	<code>\jupiter</code>	♅	<code>\uranus</code>	♇	<code>\pluto</code>
♀	<code>\venus</code>	♂	<code>\mars</code>	♄	<code>\saturn</code>	♆	<code>\neptune</code>		
☉	<code>\astrosun</code>	☾	<code>\fullmoon</code>	☾	<code>\leftmoon</code>	●	<code>\newmoon</code>	☽	<code>\rightmoon</code>
♈	<code>\aries</code>	♋	<code>\cancer</code>	♎	<code>\libra</code>	♒	<code>\aquarius</code>		
♉	<code>\taurus</code>	♌	<code>\leo</code>	♏	<code>\scorpio</code>	♑	<code>\capricornus</code>		
♊	<code>\gemini</code>	♍	<code>\virgo</code>	♐	<code>\sagittarius</code>	♓	<code>\pisces</code>		
♁	<code>\ascnode</code>	♂	<code>\descnode</code>	♄	<code>\conjunction</code>	♅	<code>\opposition</code>	♈	<code>\vernal</code>

TABLE 358: marvosym Astronomical Symbols

♿	<code>\Mercury</code>	♁	<code>\Earth</code>	♃	<code>\Jupiter</code>	♅	<code>\Uranus</code>	♇	<code>\Pluto</code>
♀	<code>\Venus</code>	♂	<code>\Mars</code>	♄	<code>\Saturn</code>	♆	<code>\Neptune</code>		
☾	<code>\Moon</code>	☉	<code>\Sun</code>						
♈	<code>\Aries</code>	♋	<code>\Cancer</code>	♎	<code>\Libra</code>		<code>\Capricorn</code>		
♉	<code>\Taurus</code>	♌	<code>\Leo</code>	♏	<code>\Scorpio</code>	♒	<code>\Aquarius</code>		
♊	<code>\Gemini</code>	♍	<code>\Virgo</code>	♐	<code>\Sagittarius</code>	♓	<code>\Pisces</code>		

Note that `\Aries... \Pisces` can also be specified with `\Zodiac{1}... \Zodiac{12}`.

TABLE 359: mathabx Astronomical Symbols

♿	<code>\Mercury</code>	♁	<code>\Earth</code>	♃	<code>\Jupiter</code>	♅	<code>\Uranus</code>	♇	<code>\Pluto</code>
♀	<code>\Venus</code>	♂	<code>\Mars</code>	♄	<code>\Saturn</code>	♆	<code>\Neptune</code>	♁	<code>\varEarth</code>
☾	<code>\fullmoon</code>	☾	<code>\leftmoon</code>	●	<code>\newmoon</code>	☽	<code>\rightmoon</code>	☉	<code>\Sun</code>
♈	<code>\Aries</code>	♉	<code>\Taurus</code>	♊	<code>\Gemini</code>				

`mathabx` also defines `\girl` as an alias for `\Venus`, `\boy` as an alias for `\Mars`, and `\Moon` as an alias for `\leftmoon`.

TABLE 360: stix Astronomical Symbols

☉	<code>\astrosun</code>	☾	<code>\leftmoon</code>	☽	<code>\rightmoon</code>	☼	<code>\sun</code>
---	------------------------	---	------------------------	---	-------------------------	---	-------------------



TABLE 361: utfsym Astronomical Symbols

☉	<code>\usym{2609}</code>	♃	<code>\usym{2643}</code>	♆	<code>\usym{264F}</code>	♁	<code>\usym{1F318}</code>
♁	<code>\usym{260A}</code>	♄	<code>\usym{2644}</code>	♅	<code>\usym{2650}</code>	☾	<code>\usym{1F319}</code>
♂	<code>\usym{260B}</code>	♆	<code>\usym{2645}</code>	♇	<code>\usym{2651}</code>	♁	<code>\usym{1F31A}</code>
♄	<code>\usym{260C}</code>	♇	<code>\usym{2646}</code>	♁	<code>\usym{2652}</code>	♂	<code>\usym{1F31B}</code>
♂	<code>\usym{260D}</code>	♁	<code>\usym{2647}</code>	♅	<code>\usym{2653}</code>	♁	<code>\usym{1F31C}</code>
♁	<code>\usym{263C}</code>	♄	<code>\usym{2648}</code>	♁	<code>\usym{1F311}</code>	♁	<code>\usym{1F31D}</code>
♁	<code>\usym{263D}</code>	♅	<code>\usym{2649}</code>	♁	<code>\usym{1F312}</code>	♁	<code>\usym{1F31E}</code>
♁	<code>\usym{263E}</code>	♁	<code>\usym{264A}</code>	♁	<code>\usym{1F313}</code>	♁	<code>\usym{1F31F}</code>
♁	<code>\usym{263F}</code>	♁	<code>\usym{264B}</code>	♁	<code>\usym{1F314}</code>	♁	<code>\usym{1F320}</code>
♁	<code>\usym{2640}</code>	♁	<code>\usym{264C}</code>	♁	<code>\usym{1F315}</code>		
♁	<code>\usym{2641}</code>	♁	<code>\usym{264D}</code>	♁	<code>\usym{1F316}</code>		
♁	<code>\usym{2642}</code>	♁	<code>\usym{264E}</code>	♁	<code>\usym{1F317}</code>		

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 362: starfont Astronomical Symbols



	<code>\Mercury</code>		<code>\Mars</code>		<code>\Uranus</code>		<code>\varTerra</code>
	<code>\Venus</code>		<code>\Jupiter</code>		<code>\Neptune</code>		<code>\varUranus</code>
	<code>\Terra</code>		<code>\Saturn</code>		<code>\Pluto</code>		<code>\varPluto</code>
	<code>\Sun</code>		<code>\Moon</code>		<code>\varMoon</code>		
	<code>\Cupido</code>		<code>\Zeus</code>		<code>\Apollon</code>		<code>\Vulkanus</code>
	<code>\Hades</code>		<code>\Kronos</code>		<code>\Admetos</code>		<code>\Poseidon</code>
	<code>\Lilith</code>		<code>\NorthNode</code>		<code>\SouthNode</code>		
	<code>\Amor</code>		<code>\Eros</code>		<code>\Juno</code>		<code>\Sappho</code>
	<code>\Ceres</code>		<code>\Hidalgo</code>		<code>\Pallas</code>		<code>\Vesta</code>
	<code>\Chiron</code>		<code>\Hygiea</code>		<code>\Psyche</code>		
	<code>\Fortune</code>						
	<code>\Aries</code>		<code>\Leo</code>		<code>\Sagittarius</code>		<code>\varCapricorn</code>
	<code>\Taurus</code>		<code>\Virgo</code>		<code>\Capricorn</code>		
	<code>\Gemini</code>		<code>\Libra</code>		<code>\Aquarius</code>		
	<code>\Cancer</code>		<code>\Scorpio</code>		<code>\Pisces</code>		
	<code>\Conjunction</code>		<code>\Square</code>		<code>\Semisextile</code>		
	<code>\Opposition</code>		<code>\Sextile</code>		<code>\Semisquare</code>		
	<code>\Trine</code>		<code>\Quincunx</code>		<code>\Sesquiquadrate</code>		
	<code>\ASC</code>		<code>\EastPoint</code>		<code>\MC</code>		
	<code>\DSC</code>		<code>\IC</code>		<code>\Vertex</code>		
	<code>\Direct</code>		<code>\Retrograde</code>		<code>\Station</code>		
	<code>\Air</code>		<code>\Earth</code>		<code>\Fire</code>		<code>\Water</code>
	<code>\Natal</code>		<code>\Pentagram</code>		<code>\Radix</code>		

TABLE 363: wasysym APL Symbols



















	<code>\APLbox</code>		<code>\APLinv</code>		<code>\APLstar</code>
	<code>\APLcomment</code>		<code>\APLleftarrowbox</code>		<code>\APLup</code>
	<code>\APLdown</code>		<code>\APLlog</code>		<code>\APLuparrowbox</code>
	<code>\APLdownarrowbox</code>		<code>\APLminus</code>		<code>\notbackslash</code>
	<code>\APLinput</code>		<code>\APLrightarrowbox</code>		<code>\notslash</code>
	<code>\APLcirc{a}</code>		<code>\APLnot{a}</code>		<code>\APLvert{a}</code>

TABLE 364: stix APL Symbols



	<code>\APLboxquestion</code>	$\nabla$	<code>\APLnotbackslash</code>
	<code>\APLboxupcaret</code>	$\neq$	<code>\APLnotslash</code>

TABLE 365: apl APL Symbols

	<code>\AB</code>	∞	<code>\DD</code>	∇	<code>\GD</code>	†	<code>\LK</code>	∓	<code>\PD</code>	↑	<code>\UA</code>	$\underline{G}$	<code>\ZG</code>	$\underline{Q}$	<code>\ZQ</code>
α	<code>\AM</code>	⊥	<code>\DE</code>	≥	<code>\GE</code>	○	<code>\LO</code>	∏	<code>\QQ</code>	—	<code>\US</code>	$\underline{H}$	<code>\ZH</code>	$\underline{B}$	<code>\ZR</code>
\	<code>\BL</code>	∇	<code>\DL</code>	→	<code>\GO</code>	∩	<code>\LU</code>	}	<code>\RB</code>	∪	<code>\UU</code>	$\underline{I}$	<code>\ZI</code>	$\underline{S}$	<code>\ZS</code>
□	<code>\BX</code>	◇	<code>\DM</code>	Δ	<code>\GU</code>	≠	<code>\NE</code>	†	<code>\RK</code>	±	<code>\XQ</code>	$\underline{J}$	<code>\ZJ</code>	$\underline{T}$	<code>\ZT</code>
\	<code>\CB</code>	⊞	<code>\DQ</code>	±	<code>\IB</code>	—	<code>\NG</code>	ρ	<code>\RO</code>	$\underline{A}$	<code>\ZA</code>	$\underline{K}$	<code>\ZK</code>	$\underline{U}$	<code>\ZU</code>
∫	<code>\CE</code>	∩	<code>\DU</code>	∩	<code>\IO</code>	★	<code>\NN</code>	c	<code>\RU</code>	$\underline{B}$	<code>\ZB</code>	$\underline{L}$	<code>\ZL</code>	$\underline{V}$	<code>\ZV</code>
∩	<code>\CO</code>	∩	<code>\EN</code>	{	<code>\LB</code>	∓	<code>\NR</code>	φ	<code>\RV</code>	$\underline{C}$	<code>\ZC</code>	$\underline{M}$	<code>\ZM</code>	$\underline{W}$	<code>\ZW</code>
○	<code>\CR</code>	∈	<code>\EP</code>	Δ	<code>\LD</code>	~	<code>\NT</code>	○	<code>\SO</code>	$\underline{D}$	<code>\ZD</code>	$\underline{N}$	<code>\ZN</code>	$\underline{X}$	<code>\ZX</code>
/	<code>\CS</code>	∫	<code>\FL</code>	≤	<code>\LE</code>	ω	<code>\OM</code>	∩	<code>\SS</code>	$\underline{E}$	<code>\ZE</code>	$\underline{O}$	<code>\ZO</code>	$\underline{Y}$	<code>\ZY</code>
↓	<code>\DA</code>	∓	<code>\FM</code>	⊗	<code>\LG</code>	v	<code>\OR</code>	∩	<code>\TR</code>	$\underline{F}$	<code>\ZF</code>	$\underline{P}$	<code>\ZP</code>	$\underline{Z}$	<code>\ZZ</code>

TABLE 366: marvosym Computer Hardware Symbols

































	<code>\ComputerMouse</code>		<code>\ParallelPort</code>		<code>\SerialInterface</code>
	<code>\Keyboard</code>		<code>\Printer</code>		<code>\SerialPort</code>

TABLE 367: keystroke Computer Keys

	<code>\Alt</code>		<code>\Enter*</code>		<code>\PrtSc*</code>
	<code>\AltGr</code>		<code>\Esc*</code>		<code>\RArrow</code>
	<code>\Break*</code>		<code>\Home*</code>		<code>\Return</code>
	<code>\BSpace<sup>†</sup></code>		<code>\Ins*</code>		<code>\Scroll*</code>
	<code>\Ctrl*</code>		<code>\LArrow</code>		<code>\Shift*</code>
	<code>\DArrow</code>		<code>\NumLock</code>		<code>\Spacebar</code>
	<code>\Del*</code>		<code>\PgDown*</code>		<code>\Tab<sup>†</sup></code>
	<code>\End*</code>		<code>\PgUp*</code>		<code>\UArrow</code>

\* Changes based on the language option passed to the keystroke package. For example, the german option makes `\Del` produce “” instead of “”.

<sup>†</sup> These symbols utilize the `rotating` package and therefore display improperly in most DVI viewers.


The `\keystroke` command draws a key with an arbitrary label. For example, “`\keystroke{F7}`” produces “”.

TABLE 368: ascii Control Characters (CP437)

⊙	\SOH	■	\BS	⊛	\SI	—	\SYN	↔	\GS
⊕	\STX	○	\HT	▶	\DLE	‡	\ETB	▲	\RS
♥	\ETX	◼	\LF	◀	\DCa	↑	\CAN	—	\US
♦	\EOT	♂	\VT	‡	\DCb	↓	\EM		
♣	\ENQ	♀	\FF	!!	\DCc	→	\SUB		
♠	\ACK	○	\CR	‡	\DCd	←	\ESC		
•	\BEL	◦	\SO	§	\NAK	⌞	\FS		
△	\DEL	⋈	\NBSP	⋈	\NUL	‡	\splitvert		

Code Page 437 (CP437), which was first utilized by the original IBM PC, uses the symbols \SOH through \US to depict ASCII characters 1–31 and \DEL to depict ASCII character 127. The \NUL symbol, not part of CP437, represents ASCII character 0. \NBSP, also not part of CP437, represents a nonbreaking space. \splitvert is merely the “|” character drawn as it was on the IBM PC.

TABLE 369: logic Logic Gates

	\ANDd		\BUFu		\NANDl		\ORd
	\ANDl		\BusWidth		\NANDr		\ORl
	\ANDr		\INVd		\NANDu		\ORr
	\ANDu		\INVl		\NORd		\ORu
	\BUFd		\INVR		\NORl		
	\BUF1		\INVu		\NORr		
	\BUFr		\NANDd		\NORu		

The `logic` package implements the digital logic-gate symbols specified by the U.S. Department of Defense’s MIL-STD-806 standard. Note that on CTAN, the package is *called* `logic`, but the package is *loaded* using `\usepackage{milstd}`. (There was already a—completely unrelated—`milstd` package on CTAN at the time of `logic`’s release.) Consequently, package details are listed under `milstd` in Table 697 and Table 698 on page 387.

TABLE 370: quantikz Quantum-Mechanics Notation

$\langle a $	<code>\bra{a}</code>	$ a\rangle$	<code>\ket{a}</code>
$\langle a b\rangle$	<code>\braket{a}{b}</code>	$ a\rangle\langle a $	<code>\proj{a}</code>

All of these symbols work in both text and math mode and scale automatically to fit their argument(s).

TABLE 371: marvosym Communication Symbols
























































	<code>\Email</code>		<code>\fax</code>		<code>\Faxmachine</code>		<code>\Lightning</code>		<code>\Pickup</code>
	<code>\EmailCT</code>		<code>\FAX</code>		<code>\Letter</code>		<code>\Mobilefone</code>		<code>\Telefon</code>

TABLE 372: marvosym Engineering Symbols

	<code>\Beam</code>		<code>\Force</code>		<code>\Octosteel</code>		<code>\RoundedTSteel</code>
	<code>\Bearing</code>		<code>\Hexasteel</code>		<code>\Rectpipe</code>		<code>\Squarepipe</code>
	<code>\Circpipe</code>		<code>\Lefttorque</code>		<code>\Rectsteel</code>		<code>\Squaresteel</code>
	<code>\Circsteel</code>		<code>\Lineload</code>		<code>\Righttorque</code>		<code>\Tsteel</code>
	<code>\Fixedbearing</code>		<code>\Loosebearing</code>		<code>\RoundedLsteel*</code>		<code>\TSteel</code>
	<code>\Flatsteel</code>		<code>\Lsteel</code>		<code>\RoundedTsteel*</code>		


































































\* `\RoundedLsteel` and `\RoundedTsteel` seem to be swapped, at least in the 2000/05/01 version of marvosym.

TABLE 373: typicons User-Interface Symbols

	<code>\tiAdjustBrightness</code>		<code>\tiInfo</code>
	<code>\tiAdjustContrast</code>		<code>\tiInfoLarge</code>
	<code>\tiArchive</code>		<code>\tiInfoLargeOutline</code>
	<code>\tiBackspace</code>		<code>\tiInfoOutline</code>
	<code>\tiBackspaceOutline</code>		<code>\tiLink</code>
	<code>\tiBatteryCharge</code>		<code>\tiLinkOutline</code>
	<code>\tiBatteryFull</code>		<code>\tiLocation</code>
	<code>\tiBatteryHigh</code>		<code>\tiLocationOutline</code>
	<code>\tiBatteryLow</code>		<code>\tiMessage</code>
	<code>\tiBatteryMid</code>		<code>\tiMessages</code>
	<code>\tiBookmark</code>		<code>\tiMessageTyping</code>





















































































(continued on next page)

*(continued from previous page)*

	<code>\tiCancel</code>		<code>\tiRefresh</code>
	<code>\tiCancelOutline</code>		<code>\tiRefreshOutline</code>
	<code>\tiChartArea</code>		<code>\tiRss</code>
	<code>\tiChartAreaOutline</code>		<code>\tiRssOutline</code>
	<code>\tiChartBar</code>		<code>\tiSortAlphabetically</code>
	<code>\tiChartBarOutline</code>		<code>\tiSortAlphabeticallyOutline</code>
	<code>\tiChartLine</code>		<code>\tiSortNumerically</code>
	<code>\tiChartLineOutline</code>		<code>\tiSortNumericallyOutline</code>
	<code>\tiChartPie</code>		<code>\tiSupport</code>
	<code>\tiChartPieOutline</code>		<code>\tiTabsOutline</code>
	<code>\tiCloudStorage</code>		<code>\tiThLarge</code>
	<code>\tiCloudStorageOutline</code>		<code>\tiThLargeOutline</code>
	<code>\tiCode</code>		<code>\tiThList</code>
	<code>\tiCodeOutline</code>		<code>\tiThListOutline</code>
	<code>\tiCog</code>		<code>\tiThMenu</code>
	<code>\tiCogOutline</code>		<code>\tiThMenuOutline</code>
	<code>\tiCss</code>		<code>\tiThSmall</code>
	<code>\tiDatabase</code>		<code>\tiThSmallOutline</code>
	<code>\tiDownload</code>		<code>\tiUpload</code>
	<code>\tiDownloadOutline</code>		<code>\tiUploadOutline</code>
	<code>\tiEdit</code>		<code>\tiWarning</code>
	<code>\tiExport</code>		<code>\tiWarningOutline</code>
	<code>\tiExportOutline</code>		<code>\tiWaves</code>
	<code>\tiFilter</code>		<code>\tiWavesOutline</code>
	<code>\tiFlowChildren</code>		<code>\tiWiFi</code>
	<code>\tiFlowMerge</code>		<code>\tiWiFiOutline</code>
	<code>\tiFlowParallel</code>		<code>\tiZoom</code>
	<code>\tiFlowSwitch</code>		<code>\tiZoomIn</code>
	<code>\tiGroup</code>		<code>\tiZoomInOutline</code>
	<code>\tiGroupOutline</code>		<code>\tiZoomOut</code>
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	<code>\tiImage</code>		<code>\tiZoomOutOutline</code>
	<code>\tiImageOutline</code>		






















































































typicons requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 374: fontawesome5 User-Interface Symbols

	<code>\faAd</code>		<code>\faListUl</code>
	<code>\faAddressBook</code>		<code>\faLocationArrow</code>
	<code>\faAddressBook[regular]</code>		<code>\faMailBulk</code>
	<code>\faAddressCard</code>		<code>\faMapMarked*</code>
	<code>\faAddressCard[regular]</code>		<code>\faMapMarked</code>
	<code>\faAdjust</code>		<code>\faMapMarker*</code>
	<code>\faAlignCenter</code>		<code>\faMapMarker</code>
	<code>\faAlignJustify</code>		<code>\faMapPin</code>
	<code>\faAlignLeft</code>		<code>\faMicrophoneAltSlash</code>
	<code>\faAlignRight</code>		<code>\faMicrophoneSlash</code>
	<code>\faArrows*</code>		<code>\faMinusCircle</code>
	<code>\faAudioDescription</code>		<code>\faMinusSquare</code>
	<code>\faBackspace</code>		<code>\faMinusSquare[regular]</code>
	<code>\faBars</code>		<code>\faMousePointer</code>
	<code>\faBatteryEmpty</code>		<code>\faMusic</code>
	<code>\faBatteryFull</code>		<code>\faNetworkWired</code>
	<code>\faBatteryHalf</code>		<code>\faObjectGroup</code>
	<code>\faBatteryQuarter</code>		<code>\faObjectGroup[regular]</code>
	<code>\faBatteryThreeQuarters</code>		<code>\faObjectUngroup</code>
	<code>\faBellSlash</code>		<code>\faObjectUngroup[regular]</code>
	<code>\faBellSlash[regular]</code>		<code>\faOutdent</code>
	<code>\faBlog</code>		<code>\faPaste</code>
	<code>\faBold</code>		<code>\faPause</code>
	<code>\faBookmark</code>		<code>\faPauseCircle</code>
	<code>\faBookmark[regular]</code>		<code>\faPauseCircle[regular]</code>
	<code>\faBorderAll</code>		<code>\faPhotoVideo</code>
	<code>\faBorderNone</code>		<code>\faPlusCircle</code>
	<code>\faBorderStyle</code>		<code>\faPlusSquare</code>
	<code>\faCartArrowDown</code>		<code>\faPlusSquare[regular]</code>
	<code>\faCartPlus</code>		<code>\faPodcast</code>
	<code>\faChartArea</code>		<code>\faPoll</code>
	<code>\faChartBar</code>		<code>\faPollH</code>
	<code>\faChartBar[regular]</code>		<code>\faPortrait</code>
	<code>\faChartLine</code>		<code>\faPowerOff</code>
	<code>\faChartPie</code>		<code>\faPrint</code>
	<code>\faClipboard</code>		<code>\faProjectDiagram</code>
	<code>\faClipboard[regular]</code>		<code>\faQrcode</code>
	<code>\faClipboardCheck</code>		<code>\faQuestionCircle</code>
	<code>\faClone</code>		<code>\faQuestionCircle[regular]</code>
	<code>\faClone[regular]</code>		<code>\faRandom</code>
	<code>\faClosedCaptioning</code>		<code>\faRedo*</code>
	<code>\faClosedCaptioning[regular]</code>		<code>\faRedo</code>

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	<code>\faCloudDownload*</code>		<code>\faRemoveFormat</code>
	<code>\faCloudUpload*</code>		<code>\faReply</code>
	<code>\faCode</code>		<code>\faReplyAll</code>
	<code>\faCodeBranch</code>		<code>\faRetweet</code>
	<code>\faCog</code>		<code>\faRoute</code>
	<code>\faColumns</code>		<code>\faRss</code>
	<code>\faComment*[regular]</code>		<code>\faRssSquare</code>
	<code>\faComment*</code>		<code>\faSave</code>
	<code>\faComment</code>		<code>\faSave[regular]</code>
	<code>\faComment[regular]</code>		<code>\faSearch</code>
	<code>\faCommentDollar</code>		<code>\faSearchDollar</code>
	<code>\faCommentDots</code>		<code>\faSearchLocation</code>
	<code>\faCommentDots[regular]</code>		<code>\faSearchMinus</code>
	<code>\faComments</code>		<code>\faSearchPlus</code>
	<code>\faComments[regular]</code>		<code>\faServer</code>
	<code>\faCommentsDollar</code>		<code>\faShapes</code>
	<code>\faCommentSlash</code>		<code>\faShare*</code>
	<code>\faCompress*</code>		<code>\faShare</code>
	<code>\faCompress</code>		<code>\faShareAltSquare</code>
	<code>\faCompressArrows*</code>		<code>\faShareSquare</code>
	<code>\faCopy</code>		<code>\faShareSquare[regular]</code>
	<code>\faCopy[regular]</code>		<code>\faSignal</code>
	<code>\faCrop*</code>		<code>\faSignature</code>
	<code>\faCrop</code>		<code>\faSignIn*</code>
	<code>\faCrosshairs</code>		<code>\faSignOut*</code>
	<code>\faCut</code>		<code>\faSitemap</code>
	<code>\faDatabase</code>		<code>\faSlidersH</code>
	<code>\faDesktop</code>		<code>\faSms</code>
	<code>\faDonate</code>		<code>\faSort</code>
	<code>\faDownload</code>		<code>\faSortAlphaDown*</code>
	<code>\faDrawPolygon</code>		<code>\faSortAlphaDown</code>
	<code>\faEdit</code>		<code>\faSortAlphaUp*</code>
	<code>\faEdit[regular]</code>		<code>\faSortAlphaUp</code>
	<code>\faEnvelope</code>		<code>\faSortAmountDown*</code>
	<code>\faEnvelope[regular]</code>		<code>\faSortAmountDown</code>
	<code>\faEnvelopeOpen</code>		<code>\faSortAmountUp*</code>
	<code>\faEnvelopeOpen[regular]</code>		<code>\faSortAmountUp</code>
	<code>\faEnvelopeOpenText</code>		<code>\faSortDown</code>
	<code>\faEnvelopeSquare</code>		<code>\faSortNumericDown*</code>
	<code>\faEraser</code>		<code>\faSortNumericDown</code>
	<code>\faEthernet</code>		<code>\faSortNumericUp*</code>
	<code>\faExchange*</code>		<code>\faSortNumericUp</code>
	<code>\faExclamationCircle</code>		<code>\faSortUp</code>
	<code>\faExclamationTriangle</code>		<code>\faSpellCheck</code>
	<code>\faExpand*</code>		<code>\faSpinner</code>

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	\faExpand		\faSquareRoot*
	\faExpandArrows*		\faStoreAltSlash
	\faExternalLink*		\faStoreSlash
	\faExternalLinkSquare*		\faStream
	\faEye		\faStreetView
	\faEye[regular]		\faStrikethrough
	\faEyeSlash		\faSubscript
	\faEyeSlash[regular]		\faSuperscript
	\faFill		\faSync*
	\faFillDrip		\faSync
	\faFilm		\faTable
	\faFilter		\faTasks
	\faFingerprint		\faTerminal
	\faFire*		\faTextHeight
	\faFont		\faTextWidth
	\faGripHorizontal		\faTh
	\faGripLines		\faThLarge
	\faGripLinesVertical		\faThList
	\faGripVertical		\faTint
	\faHashtag		\faTintSlash
	\faHeading		\faToggleOff
	\faHistory		\faToggleOn
	\faIcons		\faTrashRestore*
	\faICursor		\faTrashRestore
	\faImage		\faUnderline
	\faImage[regular]		\faUndo*
	\faImages		\faUndo
	\faImages[regular]		\faUniversalAccess
	\faInbox		\faUnlink
	\faIndent		\faUpload
	\faInfo		\faVectorSquare
	\faInfoCircle		\faVideo
	\faItalic		\faVideoSlash
	\faLanguage		\faVoicemail
	\faLaptopCode		\faWindowClose
	\faLayerGroup		\faWindowClose[regular]
	\faLevelDown*		\faWindowMaximize
	\faLevelUp*		\faWindowMaximize[regular]
	\faLink		\faWindowMinimize
	\faList*[regular]		\faWindowMinimize[regular]
	\faList*		\faWindowRestore
	\faList		\faWindowRestore[regular]
	\faList01		

TABLE 375: wasysym Biological Symbols

♀ `\female` ♂ `\male`

TABLE 376: stix Biological Symbols

♀ `\female` ♂ `\male`  
 ♀ `\Hermaphrodite` ♀ `\neuter`

TABLE 377: marvosym Biological Symbols

♀ `\FEMALE` ♀ `\FemaleMale` ♂ `\Male` ○ `\Neutral`  
 ♀ `\Female` ♀ `\Hermaphrodite` ♂ `\MALE`  
 ♀ `\FemaleFemale` ♀ `\HERMAPHRODITE` ♂ `\MaleMale`

TABLE 378: utfsym Biological Symbols

♀ `\usym{26A2}` ♀ `\usym{26A4}` ♂ `\usym{26A6}` ♂ `\usym{26A8}`  
 ♂ `\usym{26A3}` ♀ `\usym{26A5}` ♀ `\usym{26A7}` ♂ `\usym{26A9}`

All `utfsym` symbols are implemented with TikZ graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.








































TABLE 379: fontawesome5 Biological Symbols

○ `\faGenderless` ♂ `\faMarsStrokeH` ♀ `\faTransgender`  
 ♂ `\faMars` ♂ `\faMarsStrokeV` ♀ `\faVenus`  
 ♂ `\faMarsDouble` ♀ `\faNeuter` ♀ `\faVenusDouble`  
 ♂ `\faMarsStroke` ♀ `\faTransgender*` ♀ `\faVenusMars`

TABLE 380: marvosym Safety-related Symbols

☠ `\Biohazard` ☹ `\CEsign` ☢ `\Explosionsafe` ☢ `\Radioactivity`  
 ☹ `\BSEfree` ⚠ `\Estatically` ⚡ `\Laserbeam` ⛔ `\Stopsign`

TABLE 381: feyn Feynman Diagram Symbols

	<code>\bigbosonloop</code>		<code>\hfermion</code>		<code>\smallbosonloopV</code>		
	<code>\bigbosonloopA</code>		<code>\shfermion</code>		<code>\wfermion</code>		
	<code>\bigbosonloopV</code>		<code>\smallbosonloop</code>		<code>\whfermion</code>		
	<code>\gvcropped</code>		<code>\smallbosonloopA</code>				
	<code>\feyn{a}</code>		<code>\feyn{fu}</code>		<code>\feyn{glS}</code>		<code>\feyn{hs}</code>
	<code>\feyn{c}</code>		<code>\feyn{fv}</code>		<code>\feyn{glu}</code>		<code>\feyn{hu}</code>
	<code>\feyn{f}</code>		<code>\feyn{g}</code>		<code>\feyn{gu}</code>		<code>\feyn{m}</code>
	<code>\feyn{fd}</code>		<code>\feyn{g1}</code>		<code>\feyn{gv}</code>		<code>\feyn{ms}</code>
	<code>\feyn{fl}</code>		<code>\feyn{gd}</code>		<code>\feyn{gvs}</code>		<code>\feyn{p}</code>
	<code>\feyn{flS}</code>		<code>\feyn{gl}</code>		<code>\feyn{h}</code>		<code>\feyn{P}</code>
	<code>\feyn{fs}</code>		<code>\feyn{glB}</code>		<code>\feyn{hd}</code>		<code>\feyn{x}</code>

All other arguments to the `\feyn` command produce a “?” symbol.

The feyn package provides various commands for composing the preceding symbols into complete Feynman diagrams. See the feyn documentation for examples and additional information.

TABLE 382: svrsymbols Physics Ideograms

$\Delta$	<code>\adsorbate</code>	$\mathbb{X}$	<code>\experimentalsym</code>	$\mathcal{P}$	<code>\protein</code>
$\mathbb{C}$	<code>\adsorbent</code>	$\blacksquare$	<code>\externalsym</code>	$p^+$	<code>\proton</code>
$\mu^+$	<code>\antimuon</code>	$\mathcal{F}$	<code>\fermiDistrib</code>	$\mathcal{Q}$	<code>\quadrupole</code>
$\bar{\nu}$	<code>\antineutrino</code>	$\mathcal{F}$	<code>\fermion</code>	$q$	<code>\quark</code>
$\bar{n}$	<code>\antineutron</code>	$g$	<code>\Gluon</code>	$b$	<code>\quarkb</code>
$p^-$	<code>\antiproton</code>	$\mathbb{G}$	<code>\graphene</code>	$c$	<code>\quarkc</code>
$\bar{q}$	<code>\antiquark</code>	$\mathcal{G}$	<code>\graviton</code>	$d$	<code>\quarkd</code>
$\bar{b}$	<code>\antiquarkb</code>	$\mathbb{H}$	<code>\hbond</code>	$s$	<code>\quarks</code>
$\bar{c}$	<code>\antiquarkc</code>	$\mathbb{A}$	<code>\Higgsboson</code>	$t$	<code>\quarkt</code>
$\bar{d}$	<code>\antiquarkd</code>	$h^+$	<code>\hole</code>	$u$	<code>\quarku</code>
$\bar{s}$	<code>\antiquarks</code>	$\mathcal{I}$	<code>\interaction</code>	$R$	<code>\reference</code>
$\bar{t}$	<code>\antiquarkt</code>	$\mathbb{I}$	<code>\internalsym</code>	$\ll$	<code>\resistivity</code>

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$\bar{u}$	<code>\antiquarku</code>	$\textcircled{1}$	<code>\ion</code>	$\varrho^-$	<code>\rhomesonminus</code>
$\mathcal{A}$	<code>\anyon</code>	$\oplus$	<code>\ionicbond</code>	$\varrho^0$	<code>\rhomesonnull</code>
★	<code>\assumption</code>	$\Psi$	<code>\Jpsimeson</code>	$\varrho^+$	<code>\rhomesonplus</code>
⊛	<code>\atom</code>	$K^-$	<code>\Kaonminus</code>	$\boxplus$	<code>\solid</code>
★	<code>\bigassumption</code>	$K^0$	<code>\Kaonnull</code>	$\spadesuit$	<code>\spin</code>
★	<code>\Bigassumption</code>	$K^+$	<code>\Kaonplus</code>	$\spadesuit$	<code>\spindown</code>
★	<code>\biggassumption</code>	$\rightarrow$	<code>\magnon</code>	$\spadesuit$	<code>\spinup</code>
$B^-$	<code>\Bmesonminus</code>	$\mathcal{M}$	<code>\maxwellDistrib</code>	$\Phi$	<code>\surface</code>
$B^0$	<code>\Bmesonnull</code>	$\mathcal{M}$	<code>\metalbond</code>	$\mathbb{W}$	<code>\svrexample</code>
$B^+$	<code>\Bmesonplus</code>	$\mathcal{M}$	<code>\method</code>	$f$	<code>\svrphoton</code>
—	<code>\bond</code>	$\mu^-$	<code>\muon</code>	$t$	<code>\tachyon</code>
$\mathcal{B}$	<code>\boseDistrib</code>	$\nu$	<code>\neutrino</code>	$\tau^-$	<code>\tauleptonminus</code>
$\mathcal{B}$	<code>\boson</code>	$n^0$	<code>\neutron</code>	$\tau^+$	<code>\tauleptonplus</code>
⊛	<code>\conductivity</code>	$\bullet$	<code>\nucleus</code>	$T^-$	<code>\Tmesonminus</code>
$\oplus$	<code>\covbond</code>	$\curvearrowright$	<code>\orbit</code>	$T^0$	<code>\Tmesonnull</code>
$d^p$	<code>\dipole</code>	$\phi$	<code>\phimeson</code>	$T^+$	<code>\Tmesonplus</code>
$D^-$	<code>\Dmesonminus</code>	$\phi^0$	<code>\phimesonnull</code>	$\curvearrowleft$	<code>\triplecovbond</code>
$D^0$	<code>\Dmesonnull</code>	$f^{\sim}$	<code>\phonon</code>	$Y$	<code>\Upsilonmeson</code>
$D^+$	<code>\Dmesonplus</code>	$\pi^-$	<code>\pionminus</code>	$\mathfrak{f}$	<code>\varphoton</code>
$\oplus$	<code>\doublecovbond</code>	$\pi^0$	<code>\pionnull</code>	$\bullet$	<code>\water</code>
$e^-$	<code>\electron</code>	$\pi^+$	<code>\pionplus</code>	$W$	<code>\Wboson</code>
$\mathcal{E}$	<code>\errorsym</code>	$\sim e^-$	<code>\plasmon</code>	$W^-$	<code>\Wbosonminus</code>
$\eta$	<code>\etameson</code>	$\mathfrak{f}$	<code>\polariton</code>	$W^+$	<code>\Wbosonplus</code>
$\eta'$	<code>\etamesonprime</code>	$\sim \mathfrak{f}$	<code>\polaron</code>	$Z$	<code>\Zboson</code>
$\sim h^+$	<code>\exciton</code>	$e^+$	<code>\positron</code>		

## Chapter 5

# Dingbats

Dingbats are symbols such as stars, arrows, and geometric shapes. They are commonly used as bullets in itemized lists or, more generally, as a means to draw attention to the text that follows.

The `pifont` dingbat package warrants special mention. Among other capabilities, `pifont` provides a  $\LaTeX$  interface to the Zapf Dingbats font (one of the standard 35 PostScript fonts). However, rather than name each of the dingbats individually, `pifont` merely provides a single `\ding` command, which outputs the character that lies at a given position in the font. The consequence is that the `pifont` symbols can't be listed by name in this document's index, so be mindful of that fact when searching for a particular symbol.

TABLE 383: `bbding` Arrows






	<code>\ArrowBoldDownRight</code>		<code>\ArrowBoldRightShort</code>		<code>\ArrowBoldUpRight</code>
	<code>\ArrowBoldRightCircled</code>		<code>\ArrowBoldRightStrobe</code>		

TABLE 384: `pifont` Arrows











































	<code>\ding{212}</code>		<code>\ding{221}</code>		<code>\ding{230}</code>		<code>\ding{239}</code>		<code>\ding{249}</code>
	<code>\ding{213}</code>		<code>\ding{222}</code>		<code>\ding{231}</code>		<code>\ding{241}</code>		<code>\ding{250}</code>
	<code>\ding{214}</code>		<code>\ding{223}</code>		<code>\ding{232}</code>		<code>\ding{242}</code>		<code>\ding{251}</code>
	<code>\ding{215}</code>		<code>\ding{224}</code>		<code>\ding{233}</code>		<code>\ding{243}</code>		<code>\ding{252}</code>
	<code>\ding{216}</code>		<code>\ding{225}</code>		<code>\ding{234}</code>		<code>\ding{244}</code>		<code>\ding{253}</code>
	<code>\ding{217}</code>		<code>\ding{226}</code>		<code>\ding{235}</code>		<code>\ding{245}</code>		<code>\ding{254}</code>
	<code>\ding{218}</code>		<code>\ding{227}</code>		<code>\ding{236}</code>		<code>\ding{246}</code>		
	<code>\ding{219}</code>		<code>\ding{228}</code>		<code>\ding{237}</code>		<code>\ding{247}</code>		
	<code>\ding{220}</code>		<code>\ding{229}</code>		<code>\ding{238}</code>		<code>\ding{248}</code>		

TABLE 385: adfsymbols Arrows

⇒	<code>\adfarowe1</code>	↗	<code>\adfarowne1</code>	↓	<code>\adfarrows1</code>	↘	<code>\adfarrowsw1</code>
→	<code>\adfarowe2</code>	↖	<code>\adfarowne2</code>	↓	<code>\adfarrows2</code>	↙	<code>\adfarrowsw2</code>
➡	<code>\adfarowe3</code>	↗	<code>\adfarowne3</code>	↓	<code>\adfarrows3</code>	↘	<code>\adfarrowsw3</code>
➔	<code>\adfarowe4</code>	↗	<code>\adfarowne4</code>	↓	<code>\adfarrows4</code>	↘	<code>\adfarrowsw4</code>
→	<code>\adfarowe5</code>	↗	<code>\adfarowne5</code>	↓	<code>\adfarrows5</code>	↘	<code>\adfarrowsw5</code>
➔	<code>\adfarowe6</code>	↗	<code>\adfarowne6</code>	↓	<code>\adfarrows6</code>	↘	<code>\adfarrowsw6</code>
↑	<code>\adfarown1</code>	↖	<code>\adfarownw1</code>	↘	<code>\adfarrowse1</code>	←	<code>\adfarroww1</code>
↑	<code>\adfarown2</code>	↖	<code>\adfarownw2</code>	↘	<code>\adfarrowse2</code>	←	<code>\adfarroww2</code>
↑	<code>\adfarown3</code>	↖	<code>\adfarownw3</code>	↘	<code>\adfarrowse3</code>	←	<code>\adfarroww3</code>
↑	<code>\adfarown4</code>	↖	<code>\adfarownw4</code>	↘	<code>\adfarrowse4</code>	←	<code>\adfarroww4</code>
↑	<code>\adfarown5</code>	↖	<code>\adfarownw5</code>	↘	<code>\adfarrowse5</code>	←	<code>\adfarroww5</code>
↑	<code>\adfarown6</code>	↖	<code>\adfarownw6</code>	↘	<code>\adfarrowse6</code>	←	<code>\adfarroww6</code>
	↔	<code>\adfhalfarrowleft</code>		↔	<code>\adfhalfarrowright</code>		
	↔	<code>\adfhalfarrowleftsolid</code>		↔	<code>\adfhalfarrowrightsolid</code>		

Technically, the digit at the end of each `\adfarrow<dir><digit>` command is a macro argument, not part of the command name.

The preceding symbols can also be produced by passing a number or a style/direction pair to the `\adfarrow` command. For example, both `\adfarrow{19}` and `\adfarrow[comic]{east}` produce “➡”. See the `adfsymbols` documentation for more information.

TABLE 386: adform Arrows

↔	<code>\adhalfleftarrow</code>	➤	<code>\adhalfrightarrowhead</code>
↔	<code>\adhalfleftarrowhead</code>	↔	<code>\adleftarrowhead</code>
➤	<code>\adhalfrightarrow</code>	➤	<code>\adrightarrowhead</code>

TABLE 387: arev Arrows

➤	<code>\arrowbullet</code>
---	---------------------------

TABLE 388: utfsym Arrows

	<code>\usym{2794}</code>		<code>\usym{27A1}</code>		<code>\usym{27AB}</code>		<code>\usym{27B6}</code>
	<code>\usym{2798}</code>		<code>\usym{27A2}</code>		<code>\usym{27AC}</code>		<code>\usym{27B7}</code>
	<code>\usym{2799}</code>		<code>\usym{27A3}</code>		<code>\usym{27AD}</code>		<code>\usym{27B8}</code>
	<code>\usym{279A}</code>		<code>\usym{27A4}</code>		<code>\usym{27AE}</code>		<code>\usym{27B9}</code>
	<code>\usym{279B}</code>		<code>\usym{27A5}</code>		<code>\usym{27AF}</code>		<code>\usym{27BA}</code>
	<code>\usym{279C}</code>		<code>\usym{27A6}</code>		<code>\usym{27B1}</code>		<code>\usym{27BB}</code>
	<code>\usym{279D}</code>		<code>\usym{27A7}</code>		<code>\usym{27B2}</code>		<code>\usym{27BC}</code>
	<code>\usym{279E}</code>		<code>\usym{27A8}</code>		<code>\usym{27B3}</code>		<code>\usym{27BD}</code>
	<code>\usym{279F}</code>		<code>\usym{27A9}</code>		<code>\usym{27B4}</code>		<code>\usym{27BE}</code>
	<code>\usym{27A0}</code>		<code>\usym{27AA}</code>		<code>\usym{27B5}</code>		

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 389: asapsym Arrows

	<code>\asapArrowCircleFillDown</code>		<code>\asapArrowCircleOpenRight</code>
	<code>\asapArrowCircleFillDownLeft</code>		<code>\asapArrowCircleOpenUp</code>
	<code>\asapArrowCircleFillDownRight</code>		<code>\asapArrowCircleOpenUpLeft</code>
	<code>\asapArrowCircleFillLeft</code>		<code>\asapArrowCircleOpenUpRight</code>
	<code>\asapArrowCircleFillRight</code>		<code>\asapArrowDown</code>
	<code>\asapArrowCircleFillUp</code>		<code>\asapArrowDownLeft</code>
	<code>\asapArrowCircleFillUpLeft</code>		<code>\asapArrowDownRight</code>
	<code>\asapArrowCircleFillUpRight</code>		<code>\asapArrowLeft</code>
	<code>\asapArrowCircleOpenDown</code>		<code>\asapArrowRight</code>
	<code>\asapArrowCircleOpenDownLeft</code>		<code>\asapArrowUp</code>
	<code>\asapArrowCircleOpenDownRight</code>		<code>\asapArrowUpLeft</code>
	<code>\asapArrowCircleOpenLeft</code>		<code>\asapArrowUpRight</code>

`asapsym` requires either `LuaLATEX` or `XYLATEX`.

TABLE 390: typicons Arrows

	<code>\tiArrowBack</code>		<code>\tiArrowMaximise</code>		<code>\tiArrowSortedDown</code>
	<code>\tiArrowBackOutline</code>		<code>\tiArrowMaximiseOutline</code>		<code>\tiArrowSortedUp</code>
	<code>\tiArrowDown</code>		<code>\tiArrowMinimise</code>		<code>\tiArrowSync</code>
	<code>\tiArrowDownOutline</code>		<code>\tiArrowMinimiseOutline</code>		<code>\tiArrowSyncOutline</code>
	<code>\tiArrowDownThick</code>		<code>\tiArrowMove</code>		<code>\tiArrowUnsorted</code>
	<code>\tiArrowForward</code>		<code>\tiArrowMoveOutline</code>		<code>\tiArrowUp</code>
	<code>\tiArrowForwardOutline</code>		<code>\tiArrowRepeat</code>		<code>\tiArrowUpOutline</code>
	<code>\tiArrowLeft</code>		<code>\tiArrowRepeatOutline</code>		<code>\tiArrowUpThick</code>
	<code>\tiArrowLeftOutline</code>		<code>\tiArrowRight</code>		<code>\tiLocationArrow</code>
	<code>\tiArrowLeftThick</code>		<code>\tiArrowRightOutline</code>		<code>\tiLocationArrowOutline</code>
	<code>\tiArrowLoop</code>		<code>\tiArrowRightThick</code>		
	<code>\tiArrowLoopOutline</code>		<code>\tiArrowShuffle</code>		

typicons requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 391: fontawesome5 Arrows

	<code>\faArrowAltCircleDown[regular]</code>		<code>\faArrowCircleDown</code>		<code>\faArrowsAltV</code>
	<code>\faArrowAltCircleDown</code>		<code>\faArrowCircleLeft</code>		<code>\faArrowUp</code>
	<code>\faArrowAltCircleLeft[regular]</code>		<code>\faArrowCircleRight</code>		<code>\faLongArrowAltDown</code>
	<code>\faArrowAltCircleLeft</code>		<code>\faArrowCircleUp</code>		<code>\faLongArrowAltLeft</code>
	<code>\faArrowAltCircleRight</code>		<code>\faArrowDown</code>		<code>\faLongArrowAltRight</code>
	<code>\faArrowAltCircleRight[regular]</code>		<code>\faArrowLeft</code>		<code>\faLongArrowAltUp</code>
	<code>\faArrowAltCircleUp[regular]</code>		<code>\faArrowRight</code>		
	<code>\faArrowAltCircleUp</code>		<code>\faArrowsAltH</code>		

TABLE 392: marvosym Scissors

	<code>\CutLeft</code>		<code>\CuttingLine</code>		<code>\RightScissors</code>
	<code>\CutRight</code>		<code>\LeftScissors</code>		

TABLE 393: bbding Scissors






	<code>\ScissorHollowLeft</code>		<code>\ScissorLeftBrokenTop</code>
	<code>\ScissorHollowRight</code>		<code>\ScissorRight</code>
	<code>\ScissorLeft</code>		<code>\ScissorRightBrokenBottom</code>
	<code>\ScissorLeftBrokenBottom</code>		<code>\ScissorRightBrokenTop</code>

TABLE 394: pifont Scissors

	<code>\ding{33}</code>		<code>\ding{34}</code>		<code>\ding{35}</code>		<code>\ding{36}</code>
--	------------------------	--	------------------------	--	------------------------	--	------------------------



TABLE 395: utfsym Scissors

	<code>\usym{2700}</code>		<code>\usym{2702}</code>		<code>\usym{2704}</code>
	<code>\usym{2701}</code>		<code>\usym{2703}</code>		

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 396: dingbat Pencils



	<code>\largepencil</code>		<code>\smallpencil</code>
---	---------------------------	---	---------------------------

TABLE 397: arev Pencils

	<code>\pencil</code>
---	----------------------

TABLE 398: typicons Pencils and Pens

	<code>\tiPen</code>		<code>\tiPencil</code>
---	---------------------	---	------------------------

`typicons` requires either `LuaLATEX` or `XLLATEX`.

TABLE 399: fontawesome5 Pencils, Pens, and Nibs









	<code>\faHighlighter</code>		<code>\faPen</code>		<code>\faPenNib</code>
	<code>\faMarker</code>		<code>\faPencil*</code>		<code>\faPenSquare</code>
	<code>\faPen*</code>		<code>\faPenFancy</code>		

TABLE 400: bbding Pencils and Nibs











	<code>\NibLeft</code>		<code>\PencilLeft</code>		<code>\PencilRightDown</code>
	<code>\NibRight</code>		<code>\PencilLeftDown</code>		<code>\PencilRightUp</code>
	<code>\NibSolidLeft</code>		<code>\PencilLeftUp</code>		
	<code>\NibSolidRight</code>		<code>\PencilRight</code>		

TABLE 401: pifont Pencils and Nibs
















 `\ding{46}`  `\ding{47}`  `\ding{48}`  `\ding{49}`  `\ding{50}`

TABLE 402: utfsym Pencils, Pens, and Nibs

 `\usym{270E}`  `\usym{2711}`  `\usym{1F58A}`  `\usym{1F58D}`  
 `\usym{270F}`  `\usym{2712}`  `\usym{1F58B}`  
 `\usym{2710}`  `\usym{1F589}`  `\usym{1F58C}`

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 403: dingbat Fists








 `\leftpointright`  `\rightpointleft`  `\rightpointright`  
 `\leftthumbsdown`  `\rightthumbsdown`  
 `\leftthumbsup`  `\rightthumbsup`

TABLE 404: bbding Fists










 `\HandCuffLeft`  `\HandCuffRightUp`  `\HandPencilLeft`  
 `\HandCuffLeftUp`  `\HandLeft`  `\HandRight`  
 `\HandCuffRight`  `\HandLeftUp`  `\HandRightUp`

TABLE 405: pifont Fists

 `\ding{42}`  `\ding{43}`  `\ding{44}`  `\ding{45}`

TABLE 406: fourier Fists

 `\lefthand`  `\righthand`

TABLE 407: arev Fists
















































 `\pointright`

TABLE 408: utfsym Fists

	<code>\usym{261A}</code>		<code>\usym{1F447}</code>		<code>\usym{1F58F}</code>		<code>\usym{1F59A}</code>
	<code>\usym{261B}</code>		<code>\usym{1F448}</code>		<code>\usym{1F590}</code>		<code>\usym{1F59B}</code>
	<code>\usym{261C}</code>		<code>\usym{1F449}</code>		<code>\usym{1F591}</code>		<code>\usym{1F59C}</code>
	<code>\usym{261D}</code>		<code>\usym{1F44A}</code>		<code>\usym{1F592}</code>		<code>\usym{1F59D}</code>
	<code>\usym{261E}</code>		<code>\usym{1F44B}</code>		<code>\usym{1F593}</code>		<code>\usym{1F59E}</code>
	<code>\usym{261F}</code>		<code>\usym{1F44C}</code>		<code>\usym{1F594}</code>		<code>\usym{1F59F}</code>
	<code>\usym{270A}</code>		<code>\usym{1F44D}</code>		<code>\usym{1F595}</code>		<code>\usym{1F5A0}</code>
	<code>\usym{270B}</code>		<code>\usym{1F44E}</code>		<code>\usym{1F596}</code>		<code>\usym{1F5A1}</code>
	<code>\usym{270C}</code>		<code>\usym{1F44F}</code>		<code>\usym{1F597}</code>		<code>\usym{1F5A2}</code>
	<code>\usym{270D}</code>		<code>\usym{1F450}</code>		<code>\usym{1F598}</code>		<code>\usym{1F5A3}</code>
	<code>\usym{1F446}</code>		<code>\usym{1F58E}</code>		<code>\usym{1F599}</code>		

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 409: typicons Fists

	<code>\tiThumbsDown</code>		<code>\tiThumbsOk</code>		<code>\tiThumbsUp</code>
---	----------------------------	---	--------------------------	--	--------------------------

`typicons` requires either `LuaLATEX` or `XYLATEX`.

TABLE 410: fontawesome5 Fists






























	<code>\faFistRaised</code>		<code>\faHandPointUp</code>
	<code>\faHandHolding</code>		<code>\faHandPointUp[regular]</code>
	<code>\faHandHoldingHeart</code>		<code>\faHandRock</code>
	<code>\faHandHoldingMedical</code>		<code>\faHandRock[regular]</code>
	<code>\faHandHoldingUsd</code>		<code>\faHands</code>
	<code>\faHandHoldingWater</code>		<code>\faHandScissors</code>
	<code>\faHandLizard</code>		<code>\faHandScissors[regular]</code>
	<code>\faHandLizard[regular]</code>		<code>\faHandshake</code>
	<code>\faHandMiddleFinger</code>		<code>\faHandshake[regular]</code>
	<code>\faHandPaper</code>		<code>\faHandshakeAltSlash</code>
	<code>\faHandPaper[regular]</code>		<code>\faHandshakeSlash</code>
	<code>\faHandPeace</code>		<code>\faHandsHelping</code>
	<code>\faHandPeace[regular]</code>		<code>\faHandSparkles</code>
	<code>\faHandPointDown</code>		<code>\faHandSpock</code>
	<code>\faHandPointDown[regular]</code>		<code>\faHandSpock[regular]</code>
	<code>\faHandPointer</code>		<code>\faHandsWash</code>
	<code>\faHandPointer[regular]</code>		<code>\faThumbsDown</code>
	<code>\faHandPointLeft</code>		<code>\faThumbsDown[regular]</code>
	<code>\faHandPointLeft[regular]</code>		<code>\faThumbsUp</code>
	<code>\faHandPointRight</code>		<code>\faThumbsUp[regular]</code>
	<code>\faHandPointRight[regular]</code>		

TABLE 411: bbding Crosses and Pluses











	<code>\Cross</code>		<code>\CrossOpenShadow</code>		<code>\PlusOutline</code>
	<code>\CrossBoldOutline</code>		<code>\CrossOutline</code>		<code>\PlusThinCenterOpen</code>
	<code>\CrossCloverTips</code>		<code>\Plus</code>		
	<code>\CrossMaltese</code>		<code>\PlusCenterOpen</code>		

TABLE 412: pifont Crosses and Pluses









	<code>\ding{57}</code>		<code>\ding{59}</code>		<code>\ding{61}</code>		<code>\ding{63}</code>
	<code>\ding{58}</code>		<code>\ding{60}</code>		<code>\ding{62}</code>		<code>\ding{64}</code>

TABLE 413: adfsymbols Crosses and Pluses

	<code>\adfbullet{4}</code>		<code>\adfbullet{6}</code>		<code>\adfbullet{8}</code>		<code>\adfbullet{10}</code>
	<code>\adfbullet{5}</code>		<code>\adfbullet{7}</code>		<code>\adfbullet{9}</code>		

TABLE 414: utfsym Crosses and Pluses

✚	<code>\usym{2719}</code>	†	<code>\usym{271D}</code>	✚	<code>\usym{2722}</code>	†	<code>\usym{1F546}</code>
✚	<code>\usym{271A}</code>	†	<code>\usym{271E}</code>	✚	<code>\usym{2723}</code>	†	<code>\usym{1F547}</code>
✚	<code>\usym{271B}</code>	†	<code>\usym{271F}</code>	✚	<code>\usym{2724}</code>	†	<code>\usym{1F548}</code>
✚	<code>\usym{271C}</code>	✚	<code>\usym{2720}</code>	✚	<code>\usym{2725}</code>		

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TABLE 415: arev Crosses

†	<code>\eastcross</code>	†	<code>\westcross</code>
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TABLE 416: bbding Xs and Check Marks

✓	<code>\Checkmark</code>	✘	<code>\XSolid</code>	✘	<code>\XSolidBrush</code>
✓	<code>\CheckmarkBold</code>	✘	<code>\XSolidBold</code>		

TABLE 417: pifont Xs and Check Marks

✓	<code>\ding{51}</code>	✘	<code>\ding{53}</code>	✘	<code>\ding{55}</code>
✓	<code>\ding{52}</code>	✘	<code>\ding{54}</code>	✘	<code>\ding{56}</code>

TABLE 418: wasysym Xs and Check Marks

☑	<code>\CheckedBox</code>	□	<code>\Square</code>	☒	<code>\XBox</code>
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TABLE 419: marvosym Xs and Check Marks

☑	<code>\Checkedbox</code>	☒	<code>\CrossedBox*</code>	□	<code>\HollowBox</code>
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\* `marvosym` defines `\Crossedbox` as a synonym for `\CrossedBox`.

TABLE 420: arev Xs and Check Marks

✓	<code>\ballotcheck</code>	✘	<code>\ballotx</code>
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TABLE 421: utfsym Xs and Check Marks

☐	<code>\usym{2610}</code>	✓	<code>\usym{2713}</code>	✘	<code>\usym{2718}</code>	✓	<code>\usym{1F5F8}</code>
☑	<code>\usym{2611}</code>	✓	<code>\usym{2714}</code>	✘	<code>\usym{1F5F4}</code>	☑	<code>\usym{1F5F9}</code>
☒	<code>\usym{2612}</code>	✘	<code>\usym{2715}</code>	☒	<code>\usym{1F5F5}</code>		
✘	<code>\usym{2613}</code>	✘	<code>\usym{2716}</code>	✘	<code>\usym{1F5F6}</code>		
✓	<code>\usym{2705}</code>	✘	<code>\usym{2717}</code>	☒	<code>\usym{1F5F7}</code>		

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TABLE 422: typicons Xs and Check Marks

✘	<code>\tiDelete</code>	☑	<code>\tiInputCheckedOutline</code>	✘	<code>\tiTimes</code>
⊗	<code>\tiDeleteOutline</code>	✓	<code>\tiTick</code>	⊗	<code>\tiTimesOutline</code>
☑	<code>\tiInputChecked</code>	✓	<code>\tiTickOutline</code>		

`typicons` requires either `LuaATeX` or `XqLaTeX`.

TABLE 423: fontawesome5 Xs and Check Marks

✓	<code>\faCheck</code>	☑	<code>\faCheckSquare[regular]</code>
☑	<code>\faCheckCircle</code>	✘	<code>\faTimes</code>
☑	<code>\faCheckCircle[regular]</code>	✘	<code>\faTimesCircle</code>
☑	<code>\faCheckDouble</code>	⊗	<code>\faTimesCircle[regular]</code>
☑	<code>\faCheckSquare</code>		

TABLE 424: pifont Circled Numerals

①	<code>\ding{172}</code>	①	<code>\ding{182}</code>	①	<code>\ding{192}</code>	①	<code>\ding{202}</code>
②	<code>\ding{173}</code>	②	<code>\ding{183}</code>	②	<code>\ding{193}</code>	②	<code>\ding{203}</code>
③	<code>\ding{174}</code>	③	<code>\ding{184}</code>	③	<code>\ding{194}</code>	③	<code>\ding{204}</code>
④	<code>\ding{175}</code>	④	<code>\ding{185}</code>	④	<code>\ding{195}</code>	④	<code>\ding{205}</code>
⑤	<code>\ding{176}</code>	⑤	<code>\ding{186}</code>	⑤	<code>\ding{196}</code>	⑤	<code>\ding{206}</code>
⑥	<code>\ding{177}</code>	⑥	<code>\ding{187}</code>	⑥	<code>\ding{197}</code>	⑥	<code>\ding{207}</code>
⑦	<code>\ding{178}</code>	⑦	<code>\ding{188}</code>	⑦	<code>\ding{198}</code>	⑦	<code>\ding{208}</code>
⑧	<code>\ding{179}</code>	⑧	<code>\ding{189}</code>	⑧	<code>\ding{199}</code>	⑧	<code>\ding{209}</code>
⑨	<code>\ding{180}</code>	⑨	<code>\ding{190}</code>	⑨	<code>\ding{200}</code>	⑨	<code>\ding{210}</code>
⑩	<code>\ding{181}</code>	⑩	<code>\ding{191}</code>	⑩	<code>\ding{201}</code>	⑩	<code>\ding{211}</code>

`pifont` (part of the `psnfss` package) provides a `dingautolist` environment which resembles `enumerate` but uses circled numbers as bullets.<sup>1</sup> See the `psnfss` documentation for more information.

TABLE 425: utfsym Circled Numerals

①	<code>\usym{2776}</code>	⓪	<code>\usym{277E}</code>	㉞	<code>\usym{2786}</code>	⑤	<code>\usym{278E}</code>
②	<code>\usym{2777}</code>	⓫	<code>\usym{277F}</code>	㉟	<code>\usym{2787}</code>	⑥	<code>\usym{278F}</code>
③	<code>\usym{2778}</code>	④	<code>\usym{2780}</code>	㊱	<code>\usym{2788}</code>	⑦	<code>\usym{2790}</code>
④	<code>\usym{2779}</code>	②	<code>\usym{2781}</code>	⓬	<code>\usym{2789}</code>	⑧	<code>\usym{2791}</code>
⑤	<code>\usym{277A}</code>	③	<code>\usym{2782}</code>	①	<code>\usym{278A}</code>	⑨	<code>\usym{2792}</code>
⑥	<code>\usym{277B}</code>	④	<code>\usym{2783}</code>	②	<code>\usym{278B}</code>	⑩	<code>\usym{2793}</code>
⑦	<code>\usym{277C}</code>	⑤	<code>\usym{2784}</code>	③	<code>\usym{278C}</code>		
⑧	<code>\usym{277D}</code>	⑥	<code>\usym{2785}</code>	④	<code>\usym{278D}</code>		

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TABLE 426: wasysym Stars

⊠ `\davidstar`   \* `\hexstar`   \* `\varhexstar`

TABLE 427: bbding Stars, Flowers, and Similar Shapes

*	<code>\Asterisk</code>	⊠	<code>\FiveFlowerPetal</code>	⊠	<code>\JackStar</code>
* <b></b>	<code>\AsteriskBold</code>	★	<code>\FiveStar</code>	⊠ <b></b>	<code>\JackStarBold</code>
* <b>o</b>	<code>\AsteriskCenterOpen</code>	☆	<code>\FiveStarCenterOpen</code>	⊠ <b>o</b>	<code>\SixFlowerAlternate</code>
⊠	<code>\AsteriskRoundedEnds</code>	★	<code>\FiveStarConvex</code>	⊠ <b>o</b>	<code>\SixFlowerAltPetal</code>
* <b>o</b>	<code>\AsteriskThin</code>	☆	<code>\FiveStarLines</code>	⊠ <b>o</b>	<code>\SixFlowerOpenCenter</code>
* <b>o</b>	<code>\AsteriskThinCenterOpen</code>	☆	<code>\FiveStarOpen</code>	⊠ <b>o</b>	<code>\SixFlowerPetalDotted</code>
⊠	<code>\DavidStar</code>	⊠	<code>\FiveStarOpenCircled</code>	⊠ <b>o</b>	<code>\SixFlowerPetalRemoved</code>
★	<code>\DavidStarSolid</code>	★	<code>\FiveStarOpenDotted</code>	⊠ <b>o</b>	<code>\SixFlowerRemovedOpenPetal</code>
* <b>o</b>	<code>\EightAsterisk</code>	★	<code>\FiveStarOutline</code>	★	<code>\SixStar</code>
⊠	<code>\EightFlowerPetal</code>	☆	<code>\FiveStarOutlineHeavy</code>	⊠	<code>\SixteenStarLight</code>
* <b>o</b>	<code>\EightFlowerPetalRemoved</code>	☆	<code>\FiveStarShadow</code>	⊠	<code>\Snowflake</code>
* <b>o</b>	<code>\EightStar</code>	⊠	<code>\FourAsterisk</code>	⊠	<code>\SnowflakeChevron</code>
* <b>o</b>	<code>\EightStarBold</code>	⊠	<code>\FourCloverOpen</code>	⊠	<code>\SnowflakeChevronBold</code>
* <b>o</b>	<code>\EightStarConvex</code>	⊠	<code>\FourCloverSolid</code>	⊠	<code>\Sparkle</code>
* <b>o</b>	<code>\EightStarTaper</code>	◆	<code>\FourStar</code>	⊠	<code>\SparkleBold</code>
⊠	<code>\FiveFlowerOpen</code>	☆	<code>\FourStarOpen</code>	⊠	<code>\TwelveStar</code>

<sup>1</sup>In fact, `dingautolist` can use any set of consecutive Zapf Dingbats symbols.

TABLE 428: pifont Stars, Flowers, and Similar Shapes

✧	<code>\ding{65}</code>	☼	<code>\ding{74}</code>	*	<code>\ding{83}</code>	*	<code>\ding{92}</code>	*	<code>\ding{101}</code>
✦	<code>\ding{66}</code>	☆	<code>\ding{75}</code>	*	<code>\ding{84}</code>	*	<code>\ding{93}</code>	✧	<code>\ding{102}</code>
✧	<code>\ding{67}</code>	★	<code>\ding{76}</code>	*	<code>\ding{85}</code>	✧	<code>\ding{94}</code>	*	<code>\ding{103}</code>
♣	<code>\ding{68}</code>	★	<code>\ding{77}</code>	*	<code>\ding{86}</code>	♣	<code>\ding{95}</code>	*	<code>\ding{104}</code>
♣	<code>\ding{69}</code>	☆	<code>\ding{78}</code>	*	<code>\ding{87}</code>	♣	<code>\ding{96}</code>	*	<code>\ding{105}</code>
◆	<code>\ding{70}</code>	☆	<code>\ding{79}</code>	*	<code>\ding{88}</code>	♣	<code>\ding{97}</code>	*	<code>\ding{106}</code>
◇	<code>\ding{71}</code>	☆	<code>\ding{80}</code>	*	<code>\ding{89}</code>	☼	<code>\ding{98}</code>	*	<code>\ding{107}</code>
★	<code>\ding{72}</code>	*	<code>\ding{81}</code>	✧	<code>\ding{90}</code>	*	<code>\ding{99}</code>		
☆	<code>\ding{73}</code>	*	<code>\ding{82}</code>	*	<code>\ding{91}</code>	✧	<code>\ding{100}</code>		

TABLE 429: adfsymbols Stars, Flowers, and Similar Shapes

◇	<code>\adfbullet{1}</code>	*	<code>\adfbullet{13}</code>	☼	<code>\adfbullet{18}</code>	◇	<code>\adfbullet{23}</code>
☼	<code>\adfbullet{2}</code>	✧	<code>\adfbullet{14}</code>	☼	<code>\adfbullet{19}</code>	☼	<code>\adfbullet{24}</code>
*	<code>\adfbullet{3}</code>	☼	<code>\adfbullet{15}</code>	●	<code>\adfbullet{20}</code>	*	<code>\adfbullet{25}</code>
*	<code>\adfbullet{11}</code>	☼	<code>\adfbullet{16}</code>	*	<code>\adfbullet{21}</code>	☼	<code>\adfbullet{26}</code>
*	<code>\adfbullet{12}</code>	☼	<code>\adfbullet{17}</code>	☼	<code>\adfbullet{22}</code>		

TABLE 430: utfsym Stars, Flowers, and Similar Shapes

★	<code>\usym{2605}</code>	★	<code>\usym{272B}</code>	*	<code>\usym{2737}</code>	*	<code>\usym{2743}</code>
★	<code>\usym{2606}</code>	★	<code>\usym{272C}</code>	*	<code>\usym{2738}</code>	✧	<code>\usym{2744}</code>
★	<code>\usym{26E4}</code>	★	<code>\usym{272D}</code>	*	<code>\usym{2739}</code>	✧	<code>\usym{2745}</code>
★	<code>\usym{26E5}</code>	★	<code>\usym{272E}</code>	✧	<code>\usym{273A}</code>	✧	<code>\usym{2746}</code>
★	<code>\usym{26E6}</code>	★	<code>\usym{272F}</code>	*	<code>\usym{273B}</code>	*	<code>\usym{2747}</code>
✧	<code>\usym{26E7}</code>	☆	<code>\usym{2730}</code>	*	<code>\usym{273C}</code>	*	<code>\usym{2748}</code>
✧	<code>\usym{2721}</code>	*	<code>\usym{2731}</code>	*	<code>\usym{273D}</code>	*	<code>\usym{2749}</code>
◆	<code>\usym{2726}</code>	*	<code>\usym{2732}</code>	✧	<code>\usym{273E}</code>	*	<code>\usym{274A}</code>
◇	<code>\usym{2727}</code>	*	<code>\usym{2733}</code>	♣	<code>\usym{273F}</code>	*	<code>\usym{274B}</code>
♣	<code>\usym{2728}</code>	*	<code>\usym{2734}</code>	♣	<code>\usym{2740}</code>	✧	<code>\usym{1F52F}</code>
☆	<code>\usym{2729}</code>	*	<code>\usym{2735}</code>	☼	<code>\usym{2741}</code>		
☼	<code>\usym{272A}</code>	*	<code>\usym{2736}</code>	☼	<code>\usym{2742}</code>		

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TABLE 431: adorn Stars

*	<code>\adfast{1}</code>	*	<code>\adfast{3}</code>	*	<code>\adfast{5}</code>	*	<code>\adfast{7}</code>	*	<code>\adfast{9}</code>
*	<code>\adfast{2}</code>	*	<code>\adfast{4}</code>	*	<code>\adfast{6}</code>	*	<code>\adfast{8}</code>	*	<code>\adfast{10}</code>



TABLE 432: typicons Stars

★	<code>\tiStar</code>	★	<code>\tiStarFullOutline</code>	☆	<code>\tiStarOutline</code>
✻	<code>\tiStarburst</code>	✦	<code>\tiStarHalf</code>		
⊛	<code>\tiStarburstOutline</code>	☆	<code>\tiStarHalfOutline</code>		

typicons requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 433: fontawesome5 Stars

★	<code>\faStar</code>	☆	<code>\faStarHalf*</code>	✧	<code>\faStarHalf[regular]</code>
☆	<code>\faStar[regular]</code>	✦	<code>\faStarHalf</code>	✳	<code>\faStarOfLife</code>

TABLE 434: fourier Fleurons and Flowers

🌸	<code>\aldine</code>	✻	<code>\decoone</code>	🌺	<code>\floweroneright</code>
🌸	<code>\aldineleft</code>	✧	<code>\decosix</code>	🌿	<code>\leafleft</code>
🌸	<code>\aldineright</code>	🌿	<code>\decothreeleft</code>	🌿	<code>\leafNE</code>
🌸	<code>\aldinesmall</code>	🌿	<code>\decothreeright</code>	🌿	<code>\leafright</code>
🌿	<code>\decofourleft</code>	🌿	<code>\decotwo</code>	+	<code>\starredbullet</code>
🌿	<code>\decofourright</code>	🌺	<code>\floweroneleft</code>		

TABLE 435: adorn Fleurons and Flowers

🌿	<code>\adfdownhalfleafleft</code>	🌿	<code>\adfdownhalfleafright</code>
🌿	<code>\adfdownleafleft</code>	🌿	<code>\adfdownleafright</code>
🌿	<code>\adfflatdownhalfleafleft</code>	🌿	<code>\adfflatdownhalfleafright</code>
🌿	<code>\adfflatdownoutlineleafleft</code>	🌿	<code>\adfflatdownoutlineleafright</code>
🌿	<code>\adfflatleafleft</code>	🌿	<code>\adfflatleafright</code>
🌿	<code>\adfflatleafoutlineleft</code>	🌿	<code>\adfflatleafoutlineright</code>
🌿	<code>\adfflatleafsolidleft</code>	🌿	<code>\adfflatleafsolidright</code>
🌿	<code>\adfflowerleft</code>	🌿	<code>\adfflowerright</code>
🌿	<code>\adfhalfleafleft</code>	🌿	<code>\adfhalfleafright</code>
🌿	<code>\adfhangingflatleafleft</code>	🌿	<code>\adfhangingflatleafright</code>
🌿	<code>\adfhangingleafleft</code>	🌿	<code>\adfhangingleafright</code>
🌿	<code>\adfleafleft</code>	🌿	<code>\adfleafright</code>
🌿	<code>\adfoutlineleafleft</code>	🌿	<code>\adfoutlineleafright</code>
🌿	<code>\adfsmallhangingleafleft</code>	🌿	<code>\adfsmallhangingleafright</code>
🌿	<code>\adfsmallleafleft</code>	🌿	<code>\adfsmallleafright</code>
🌿	<code>\adfsolidleafleft</code>	🌿	<code>\adfsolidleafright</code>

TABLE 436: wasysym Geometric Shapes

○	<code>\Circle</code>	◐	<code>\LEFTcircle</code>	◯	<code>\octagon</code>	◑	<code>\RIGHTcircle</code>
●	<code>\CIRCLE</code>	◐	<code>\LEFTCIRCLE</code>	◕	<code>\pentagon</code>	◑	<code>\RIGHTCIRCLE</code>
◈	<code>\hexagon</code>	◑	<code>\Leftcircle</code>	◒	<code>\Rightcircle</code>	◉	<code>\varhexagon</code>

TABLE 437: MnSymbol Geometric Shapes

★	<code>\filledlargestar</code>	◇	<code>\largelozenge</code>	◇	<code>\medlozenge</code>
◆	<code>\filledlozenge</code>	☆	<code>\largepentagram</code>	☆	<code>\medstarofdavid</code>
◆	<code>\filledmedlozenge</code>	□	<code>\largesquare</code>	◇	<code>\smalllozenge</code>
○	<code>\largecircle</code>	☆	<code>\largestar</code>		
◇	<code>\largediamond</code>	☆	<code>\largestarofdavid</code>		

MnSymbol defines `\bigcirc` as a synonym for `\largecircle`; `\bigstar` as a synonym for `\filledlargestar`; `\lozenge` as a synonym for `\medlozenge`; and, `\blacklozenge` as a synonym for `\filledmedlozenge`.

TABLE 438: fdsymbol Geometric Shapes

●	<code>\largeblackcircle</code>	▽	<code>\largetriangleup</code>	◇	<code>\medlozenge</code>
■	<code>\largeblacksquare</code>	△	<code>\largetriangleup</code>	◆	<code>\smallblacklozenge</code>
★	<code>\largeblackstar</code>	☆	<code>\largewhitestar</code>	◇	<code>\smalllozenge</code>
○	<code>\largecircle</code>	◇	<code>\lozengeminus</code>	☆	<code>\starofdavid</code>
□	<code>\largesquare</code>	◆	<code>\medblacklozenge</code>		


fdsymbol defines synonyms for almost all of the preceding symbols:

○	<code>\bigcirc</code>	■	<code>\lgblksquare</code>	◇	<code>\mdlghtlozenge</code>
★	<code>\bigstar</code>	○	<code>\lgwhtcircle</code>	◇	<code>\mdwhtlozenge</code>
▽	<code>\bigtriangledown</code>	□	<code>\lgwhtsquare</code>	◆	<code>\smbklozenge</code>
△	<code>\bigtriangleup</code>	◇	<code>\lozenge</code>	◇	<code>\smwhtlozenge</code>
◆	<code>\blacklozenge</code>	◆	<code>\mdblklzenge</code>		
●	<code>\lgblkcircle</code>	◆	<code>\mdlgbklozenge</code>		

TABLE 439: boisik Geometric Shapes

★	<code>\bigstar</code>	◇	<code>\diamond</code>	▽	<code>\triangledown</code>
◆	<code>\blacklozenge</code>	◇	<code>\lozenge</code>	◁	<code>\triangleleft</code>
■	<code>\blacksquare</code>	◇	<code>\lozengedot</code>	▷	<code>\triangleright</code>
▲	<code>\blacktriangle</code>	□	<code>\square</code>	⚡	<code>\varlrrtriangle</code>
▼	<code>\blacktriangledown</code>	*	<code>\star</code>		

TABLE 440: stix Geometric Shapes

	<code>\acwopencirclearrow</code>		<code>\enclosecircle</code>		<code>\smbldiamond</code>
	<code>\barovernorthwestarrow</code>		<code>\enclosediamond</code>		<code>\smbldlozenge</code>
	<code>\benzenr</code>		<code>\enclosesquare</code>		<code>\smblsquare</code>
	<code>\bigblacktriangledown</code>		<code>\enclosetriangle</code>		<code>\smwhitestar</code>
	<code>\bigblacktriangleup</code>		<code>\errbarblackcircle</code>		<code>\smwhtcircle</code>
	<code>\bigstar</code>		<code>\errbarblackdiamond</code>		<code>\smwhtdiamond</code>
	<code>\bigtriangledown</code>		<code>\errbarblacksquare</code>		<code>\smwhtlozenge</code>
	<code>\bigtriangleleft</code>		<code>\errbarcircle</code>		<code>\smwhtsquare</code>
	<code>\bigtriangleup</code>		<code>\errbardiamond</code>		<code>\sqlozenge</code>
	<code>\bigwhitestar</code>		<code>\errbarsquare</code>		<code>\squarebotblack</code>
	<code>\blackcircledownarrow</code>		<code>\fisheye</code>		<code>\squarecrossfill</code>
	<code>\blackcircledrightdot</code>		<code>\fltns</code>		<code>\squarehfill</code>
	<code>\blackcircledtwodots</code>		<code>\hexagon</code>		<code>\squarehvfill</code>
	<code>\blackcircleulquadwhite</code>		<code>\hexagonblack</code>		<code>\squareleftblack</code>
	<code>\blackdiamonddownarrow</code>		<code>\house</code>		<code>\squarellblack</code>
	<code>\blackinwhitediamond</code>		<code>\hrectangle</code>		<code>\squarellquad</code>
	<code>\blackinwhitesquare</code>		<code>\hrectangleblack</code>		<code>\squarelrblack</code>
	<code>\blacklefthalfcircle</code>		<code>\inversewhitecircle</code>		<code>\squarelrquad</code>
	<code>\blackpointerleft</code>		<code>\invwhitelowerhalfcircle</code>		<code>\squareneswfill</code>
	<code>\blackpointerright</code>		<code>\invwhiteupperhalfcircle</code>		<code>\squarenwsefill</code>
	<code>\blackrighthalfcircle</code>		<code>\lgblkcircle</code>		<code>\squarerightblack</code>
	<code>\blacktriangle</code>		<code>\lgblksquare</code>		<code>\squaretopblack</code>
	<code>\blacktriangledown</code>		<code>\lgwhtcircle</code>		<code>\squareulblack</code>
	<code>\blacktriangleleft</code>		<code>\lgwhtsquare</code>		<code>\squareulquad</code>
	<code>\blacktriangleright</code>		<code>\llblacktriangle</code>		<code>\squareurblack</code>
	<code>\blkhorzoval</code>		<code>\lltriangle</code>		<code>\squareurquad</code>
	<code>\blkvertoval</code>		<code>\lrblacktriangle</code>		<code>\squarevfill</code>
	<code>\botsemicircle</code>		<code>\lrtriangle</code>		<code>\squoval</code>
	<code>\boxonbox</code>		<code>\mdblkcircle</code>		<code>\topsemicircle</code>
	<code>\bullseye</code>		<code>\mdblkdiamond</code>		<code>\trapezium</code>
	<code>\circ</code>		<code>\mdblklozenge</code>		<code>\trianglecdot</code>
	<code>\circlebottomhalfblack</code>		<code>\mdblksquare</code>		<code>\triangledown</code>
	<code>\circledbullet</code>		<code>\mdlgbkcircle</code>		<code>\triangleleftblack</code>
	<code>\circledownarrow</code>		<code>\mdlgbkdiamond</code>		<code>\triangleodot</code>
	<code>\circledrightdot</code>		<code>\mdlgbklozenge</code>		<code>\trianglerightblack</code>
	<code>\circledstar</code>		<code>\mdlgbksquare</code>		<code>\triangles</code>
	<code>\circledtwodots</code>		<code>\mdlgwhtdiamond</code>		<code>\triangleubar</code>
	<code>\circledwhitebullet</code>		<code>\mdlgwhtlozenge</code>		<code>\ulblacktriangle</code>
	<code>\circlelefthalfblack</code>		<code>\mdlgwhtsquare</code>		<code>\ultriangle</code>
	<code>\circlellquad</code>		<code>\mdsmbkcircle</code>		<code>\uparrowwncircle</code>
	<code>\circlelrquad</code>		<code>\mdsmbksquare</code>		<code>\urblacktriangle</code>
	<code>\circlelighthalfblack</code>		<code>\mdsmwhtcircle</code>		<code>\urtriangle</code>
	<code>\circletophalfblack</code>		<code>\mdsmwhtsquare</code>		<code>\varhexagon</code>

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	<code>\circleulquad</code>		<code>\mdwhtcircle</code>		<code>\varhexagonblack</code>
	<code>\circleurquad</code>		<code>\mdwhtdiamond</code>		<code>\varhexagonlrbonds</code>
	<code>\circleurquadblack</code>		<code>\mdwhtlozenge</code>		<code>\varlrtriangle</code>
	<code>\circlevertfill</code>		<code>\mdwhtsquare</code>		<code>\varstar</code>
	<code>\cirE</code>		<code>\medblackstar</code>		<code>\vartriangleleft</code>
	<code>\cirscir</code>		<code>\medwhitestar</code>		<code>\vartriangleright</code>
	<code>\cwopencirclearrow</code>		<code>\parallelogram</code>		<code>\vrectangle</code>
	<code>\diamondbotblack</code>		<code>\parallelogramblack</code>		<code>\vrectangleblack</code>
	<code>\diamondcdot</code>		<code>\pentagon</code>		<code>\vysmblksquare</code>
	<code>\diamondleftblack</code>		<code>\pentagonblack</code>		<code>\vysmwhtsquare</code>
	<code>\diamondrightblack</code>		<code>\rightpentagon</code>		<code>\whiteinwhitetriangle</code>
	<code>\diamondtopblack</code>		<code>\rightpentagonblack</code>		<code>\whitepointerleft</code>
	<code>\dottedcircle</code>		<code>\smallblacktriangleleft</code>		<code>\whitepointerright</code>
	<code>\dottedsquare</code>		<code>\smallblacktriangleright</code>		<code>\wthorzoval</code>
	<code>\downtriangleleftblack</code>		<code>\smalltriangleleft</code>		<code>\whtvertoval</code>
	<code>\downtrianglerightblack</code>		<code>\smalltriangleright</code>		

stix defines `\diamond` as a synonym for `\smwhtdiamond`, `\blacksquare` as a synonym for `\mdlgblksquare`, `\square` and `\Box` as synonyms for `\mdlgwhtsquare`, `\triangle` and `\varbigtriangleup` as synonyms for `\bigtriangleup`, `\rhd` as a synonym for `\vartriangleright`, `\varbigtriangledown` as a synonym for `\bigtriangledown`, `\lhd` as a synonym for `\vartriangleleft`, `\Diamond` and `\lozenge` as synonyms for `\mdlgwhtlozenge`, `\bigcirc` as a synonym for `\mdlgwhtcircle`, `\circ` as a synonym for `\smwhtcircle`. and `\blacklozenge` as a synonym for `\mdlgblklozenge`.

TABLE 441: ifsym Geometric Shapes

	<code>\BigCircle</code>		<code>\FilledBigTriangleRight</code>		<code>\SmallCircle</code>
	<code>\BigCross</code>		<code>\FilledBigTriangleUp</code>		<code>\SmallCross</code>
	<code>\BigDiamondshape</code>		<code>\FilledCircle</code>		<code>\SmallDiamondshape</code>
	<code>\BigHBar</code>		<code>\FilledDiamondShadowA</code>		<code>\SmallHBar</code>
	<code>\BigLowerDiamond</code>		<code>\FilledDiamondShadowC</code>		<code>\SmallLowerDiamond</code>
	<code>\BigRightDiamond</code>		<code>\FilledDiamondshape</code>		<code>\SmallRightDiamond</code>
	<code>\BigSquare</code>		<code>\FilledSmallCircle</code>		<code>\SmallSquare</code>
	<code>\BigTriangleDown</code>		<code>\FilledSmallDiamondshape</code>		<code>\SmallTriangleDown</code>
	<code>\BigTriangleLeft</code>		<code>\FilledSmallSquare</code>		<code>\SmallTriangleLeft</code>
	<code>\BigTriangleRight</code>		<code>\FilledSmallTriangleDown</code>		<code>\SmallTriangleRight</code>
	<code>\BigTriangleUp</code>		<code>\FilledSmallTriangleLeft</code>		<code>\SmallTriangleUp</code>

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	<code>\BigVBar</code>	▶	<code>\FilledSmallTriangleRight</code>		<code>\SmallVBar</code>
○	<code>\Circle</code>	▲	<code>\FilledSmallTriangleUp</code>	↓	<code>\SpinDown</code>
×	<code>\Cross</code>	■	<code>\FilledSquare</code>	↑	<code>\SpinUp</code>
◇	<code>\DiamondShadowA</code>	▣	<code>\FilledSquareShadowA</code>	□	<code>\Square</code>
◇	<code>\DiamondShadowB</code>	▣	<code>\FilledSquareShadowC</code>	▣	<code>\SquareShadowA</code>
◇	<code>\DiamondShadowC</code>	▼	<code>\FilledTriangleDown</code>	▣	<code>\SquareShadowB</code>
◇	<code>\Diamondshape</code>	◀	<code>\FilledTriangleLeft</code>	▣	<code>\SquareShadowC</code>
●	<code>\FilledBigCircle</code>	▶	<code>\FilledTriangleRight</code>	▽	<code>\TriangleDown</code>
◆	<code>\FilledBigDiamondshape</code>	▲	<code>\FilledTriangleUp</code>	◁	<code>\TriangleLeft</code>
■	<code>\FilledBigSquare</code>	—	<code>\HBar</code>	▷	<code>\TriangleRight</code>
▼	<code>\FilledBigTriangleDown</code>	◇	<code>\LowerDiamond</code>	△	<code>\TriangleUp</code>
◀	<code>\FilledBigTriangleLeft</code>	◇	<code>\RightDiamond</code>		<code>\VBar</code>

The ifsym documentation points out that one can use `\rlap` to combine some of the above into useful, new symbols. For example, `\BigCircle` and `\FilledSmallCircle` combine to give “◉”. Likewise, `\Square` and `\Cross` combine to give “⊠”. See Section 12.3 for more information about constructing new symbols out of existing symbols.

TABLE 442: bbding Geometric Shapes

○	<code>\CircleShadow</code>		<code>\Rectangle</code>	▣	<code>\SquareShadowTopLeft</code>
●	<code>\CircleSolid</code>	■	<code>\RectangleBold</code>	▣	<code>\SquareShadowTopRight</code>
◆	<code>\DiamondSolid</code>		<code>\RectangleThin</code>	■	<code>\SquareSolid</code>
○	<code>\Ellipse</code>	□	<code>\Square</code>	▼	<code>\TriangleDown</code>
○	<code>\EllipseShadow</code>	▣	<code>\SquareCastShadowBottomRight</code>	▲	<code>\TriangleUp</code>
●	<code>\EllipseSolid</code>	▣	<code>\SquareCastShadowTopLeft</code>		
◐	<code>\HalfCircleLeft</code>	▣	<code>\SquareCastShadowTopRight</code>		
◑	<code>\HalfCircleRight</code>	▣	<code>\SquareShadowBottomRight</code>		

TABLE 443: pifont Geometric Shapes

●	<code>\ding{108}</code>	▣	<code>\ding{111}</code>	▣	<code>\ding{114}</code>	◆	<code>\ding{117}</code>		<code>\ding{121}</code>
○	<code>\ding{109}</code>	▣	<code>\ding{112}</code>	▲	<code>\ding{115}</code>	◐	<code>\ding{119}</code>	■	<code>\ding{122}</code>
■	<code>\ding{110}</code>	▣	<code>\ding{113}</code>	▼	<code>\ding{116}</code>		<code>\ding{120}</code>		

TABLE 444: universa Geometric Shapes

●	<code>\baucircle</code>	■	<code>\bausquare</code>	▲	<code>\bautriangle</code>
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TABLE 445: adfsymbols Geometric Shapes

• <code>\adfbullet{27}</code>	▶ <code>\adfbullet{32}</code>	• <code>\adfbullet{43}</code>	✦ <code>\adfbullet{48}</code>
• <code>\adfbullet{28}</code>	▲ <code>\adfbullet{33}</code>	• <code>\adfbullet{44}</code>	✦ <code>\adfbullet{49}</code>
▪ <code>\adfbullet{29}</code>	▼ <code>\adfbullet{34}</code>	◦ <code>\adfbullet{45}</code>	✦ <code>\adfbullet{50}</code>
◆ <code>\adfbullet{30}</code>	• <code>\adfbullet{41}</code>	▪ <code>\adfbullet{46}</code>	◊ <code>\adfbullet{51}</code>
◄ <code>\adfbullet{31}</code>	• <code>\adfbullet{42}</code>	▪ <code>\adfbullet{47}</code>	◦ <code>\adfbullet{52}</code>

TABLE 446: utfsym Geometric Shapes

● <code>\usym{1F534}</code>	◆ <code>\usym{1F537}</code>	▲ <code>\usym{1F53A}</code>	▼ <code>\usym{1F53D}</code>
● <code>\usym{1F535}</code>	◆ <code>\usym{1F538}</code>	▼ <code>\usym{1F53B}</code>	
◆ <code>\usym{1F536}</code>	◆ <code>\usym{1F539}</code>	▲ <code>\usym{1F53C}</code>	

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 447: fontawesome5 Geometric Shapes

● <code>\faCircle</code>	● <code>\faDotCircle</code>	□ <code>\faSquare[regular]</code>
○ <code>\faCircle[regular]</code>	⊙ <code>\faDotCircle[regular]</code>	■ <code>\faSquareFull</code>
◉ <code>\faCircleNotch</code>	■ <code>\faSquare</code>	

TABLE 448: oplotsymb1 Geometric Shapes

○ <code>\circlet</code>	◆ <code>\rhombusfillha</code>	△ <code>\trianglepalineh</code>
⊗ <code>\circletcross</code>	◆ <code>\rhombusfillhb</code>	△ <code>\trianglepalinev</code>
⊙ <code>\circletdot</code>	◆ <code>\rhombusfillhl</code>	△ <code>\trianglepalinevh</code>
● <code>\circletfill</code>	◆ <code>\rhombusfillhr</code>	▽ <code>\trianglepb</code>
● <code>\circletfillha</code>	◇ <code>\rhombuslineh</code>	⊗ <code>\trianglepbcross</code>
● <code>\circletfillhb</code>	◇ <code>\rhombuslinev</code>	▽ <code>\trianglepbdot</code>
● <code>\circletfillhl</code>	◇ <code>\rhombuslinevh</code>	▼ <code>\trianglepbfill</code>
● <code>\circletfillhr</code>	□ <code>\squad</code>	▽ <code>\trianglepbfillha</code>
⊖ <code>\circletlineh</code>	⊗ <code>\squadcross</code>	▼ <code>\trianglepbfillhb</code>
⊖ <code>\circletlinev</code>	⊠ <code>\squaddot</code>	▼ <code>\trianglepbfillhl</code>
⊖ <code>\circletlinevh</code>	■ <code>\squadfill</code>	▼ <code>\trianglepbfillhr</code>

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	<code>\hexago</code>		<code>\squadfillha</code>		<code>\trianglepblineh</code>
	<code>\hexagocross</code>		<code>\squadfillhb</code>		<code>\trianglepblinev</code>
	<code>\hexagodot</code>		<code>\squadfillhl</code>		<code>\trianglepblinevh</code>
	<code>\hexagofill</code>		<code>\squadfillhr</code>		<code>\trianglepl</code>
	<code>\hexagofillha</code>		<code>\squadlineh</code>		<code>\triangleplcross</code>
	<code>\hexagofillhb</code>		<code>\squadlinev</code>		<code>\trianglepldot</code>
	<code>\hexagofillhl</code>		<code>\squadlinevh</code>		<code>\triangleplfill</code>
	<code>\hexagofillhr</code>		<code>\starlet</code>		<code>\triangleplfillha</code>
	<code>\hexagolineh</code>		<code>\starletcross</code>		<code>\triangleplfillhb</code>
	<code>\hexagolinev</code>		<code>\starletdot</code>		<code>\triangleplfillhl</code>
	<code>\hexagolinevh</code>		<code>\starletfill</code>		<code>\triangleplfillhr</code>
	<code>\pentago</code>		<code>\starletfillha</code>		<code>\trianglepllineh</code>
	<code>\pentagocross</code>		<code>\starletfillhb</code>		<code>\trianglepllinev</code>
	<code>\pentagodot</code>		<code>\starletfillhl</code>		<code>\trianglepllinevh</code>
	<code>\pentagofill</code>		<code>\starletfillhr</code>		<code>\trianglepr</code>
	<code>\pentagofillha</code>		<code>\starletlineh</code>		<code>\triangleprcross</code>
	<code>\pentagofillhb</code>		<code>\starletlinev</code>		<code>\triangleprdot</code>
	<code>\pentagofillhl</code>		<code>\starletlinevh</code>		<code>\triangleprfill</code>
	<code>\pentagofillhr</code>		<code>\trianglepa</code>		<code>\triangleprfillha</code>
	<code>\pentagolineh</code>		<code>\trianglepacross</code>		<code>\triangleprfillhb</code>
	<code>\pentagolinev</code>		<code>\trianglepadot</code>		<code>\triangleprfillhl</code>
	<code>\pentagolinevh</code>		<code>\trianglepafill</code>		<code>\triangleprfillhr</code>
	<code>\rhombus</code>		<code>\trianglepafillha</code>		<code>\triangleprlineh</code>
	<code>\rhombuscross</code>		<code>\trianglepafillhb</code>		<code>\triangleprlinev</code>
	<code>\rhombusdot</code>		<code>\trianglepafillhl</code>		<code>\triangleprlinevh</code>
	<code>\rhombusfill</code>		<code>\trianglepafillhr</code>		

“fillha”, “fillhb”, “fillhl”, and “fillhr”, imply, respectively, “half-filled above”, “half-filled below”, “half-filled left”, and “half-filled right”. In the `\triangle...` symbols, “pa”, “pb”, “pr”, and “pl” refer respectively to “peak above”, “peak below”, “peak left”, and “peak right”.

All `oplotsymb1` symbols are implemented with `TikZ` graphics, not with a font.

TABLE 449: adorn Flourishes

	<code>\adfclosedflourishleft</code>		<code>\adfclosedflourishright</code>
	<code>\adfdoubleflourishleft</code>		<code>\adfdoubleflourishright</code>
	<code>\adfdoublesharppflourishleft</code>		<code>\adfdoublesharppflourishright</code>
	<code>\adfflourishleft</code>		<code>\adfflourishright</code>
	<code>\adfflourishleftdouble</code>		<code>\adfflourishrightdouble</code>
	<code>\adfopenflourishleft</code>		<code>\adfopenflourishright</code>
	<code>\adfsharpflourishleft</code>		<code>\adfsharpflourishright</code>
	<code>\adsickleflourishleft</code>		<code>\adsickleflourishright</code>
	<code>\adfsingleflourishleft</code>		<code>\adfsingleflourishright</code>
	<code>\adftripleflourishleft</code>		<code>\adftripleflourishright</code>
	<code>\adfwavesleft</code>		<code>\adfwavesright</code>

TABLE 450: Miscellaneous oplotsymb1 Symbols

– \lineh | \linev + \linevh × \scross \* \scrossvh

All oplotsymb1 symbols are implemented with TikZ graphics, not with a font.

TABLE 451: Miscellaneous dingbat Dingbats










	\anchor		\eye		\Sborder
	\carriagereturn		\filledsquarewithdots		\squarewithdots
	\checkmark		\satellitedish		\Zborder

TABLE 452: Miscellaneous bbding Dingbats

	\Envelope		\Peace		\PhoneHandset		\SunshineOpenCircled
	\OrnamentDiamondSolid		\Phone		\Plane		\Tape

TABLE 453: Miscellaneous pifont Dingbats















	\ding{37}		\ding{40}		\ding{164}		\ding{167}		\ding{171}
	\ding{38}		\ding{41}		\ding{165}		\ding{168}		\ding{169}
	\ding{39}		\ding{118}		\ding{166}		\ding{170}		

TABLE 454: Miscellaneous adorn Dingbats

• \adfbullet ◊ \adfdiamond ₣ \adfgee § \adfS ◻ \adfsquare



TABLE 455: Miscellaneous utfsym Dingbats

Ⓞ	<code>\usym{2706}</code>	‡	<code>\usym{2755}</code>	⋮	<code>\usym{2762}</code>	➤	<code>\usym{276F}</code>
Ⓟ	<code>\usym{2707}</code>	⬥	<code>\usym{2756}</code>	⋮	<code>\usym{2763}</code>	⚡	<code>\usym{2770}</code>
✈	<code>\usym{2708}</code>	!	<code>\usym{2757}</code>	♥	<code>\usym{2764}</code>	Ⓜ	<code>\usym{2771}</code>
☒	<code>\usym{2709}</code>		<code>\usym{2758}</code>	♣	<code>\usym{2765}</code>	(	<code>\usym{2772}</code>
✕	<code>\usym{274C}</code>		<code>\usym{2759}</code>	♣	<code>\usym{2766}</code>	)	<code>\usym{2773}</code>
○	<code>\usym{274D}</code>	■	<code>\usym{275A}</code>	♣	<code>\usym{2767}</code>	Ⓛ	<code>\usym{2774}</code>
☒	<code>\usym{274E}</code>	♠	<code>\usym{275B}</code>	(	<code>\usym{2768}</code>	Ⓜ	<code>\usym{2775}</code>
□	<code>\usym{274F}</code>	♠	<code>\usym{275C}</code>	)	<code>\usym{2769}</code>	+	<code>\usym{2795}</code>
□	<code>\usym{2750}</code>	“	<code>\usym{275D}</code>	(	<code>\usym{276A}</code>	—	<code>\usym{2796}</code>
□	<code>\usym{2751}</code>	”	<code>\usym{275E}</code>	)	<code>\usym{276B}</code>	÷	<code>\usym{2797}</code>
□	<code>\usym{2752}</code>	♠	<code>\usym{275F}</code>	(	<code>\usym{276C}</code>	σ	<code>\usym{27B0}</code>
?	<code>\usym{2753}</code>	”	<code>\usym{2760}</code>	)	<code>\usym{276D}</code>	σσ	<code>\usym{27BF}</code>
?	<code>\usym{2754}</code>	‡	<code>\usym{2761}</code>	◀	<code>\usym{276E}</code>		

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

## Chapter 6

# Ancient languages

This chapter presents letters and ideograms from various ancient scripts. Some of these symbols may also be useful in other typesetting contexts because of their pictorial nature.

TABLE 456: phaistos Symbols from the Phaistos Disk














































	<code>\PHarrow</code>		<code>\PHeagle</code>		<code>\PHplumedHead</code>
	<code>\PHbee</code>		<code>\PHflute</code>		<code>\PHram</code>
	<code>\PHbeehive</code>		<code>\PHgauntlet</code>		<code>\PHrosette</code>
	<code>\PHboomerang</code>		<code>\PHgrater</code>		<code>\PHsaw</code>
	<code>\PHbow</code>		<code>\PHhelmet</code>		<code>\PHshield</code>
	<code>\PHbullLeg</code>		<code>\PHhide</code>		<code>\PHship</code>
	<code>\PHcaptive</code>		<code>\PHhorn</code>		<code>\PHsling</code>
	<code>\PHcarpentryPlane</code>		<code>\PHlid</code>		<code>\PHsmallAxe</code>
	<code>\PHcat</code>		<code>\PHlily</code>		<code>\PHstrainer</code>
	<code>\PHchild</code>		<code>\PHmanacles</code>		<code>\PHtattooedHead</code>
	<code>\PHclub</code>		<code>\PHmattock</code>		<code>\PHtiara</code>
	<code>\PHcolumn</code>		<code>\PHoxBack</code>		<code>\PHtunny</code>
	<code>\PHcomb</code>		<code>\PHpapyrus</code>		<code>\PHvine</code>
	<code>\PHdolium</code>		<code>\PHpedestrian</code>		<code>\PHwavyBand</code>
	<code>\PHdove</code>		<code>\PHplaneTree</code>		<code>\PHwoman</code>

TABLE 457: protosem Proto-Semitic Characters

𐤀	<code>\Aaleph</code>	𐤁	<code>\AAhe</code>	𐤂	<code>\Akaph</code>	𐤃	<code>\AAayin</code>	𐤄	<code>\AAresh</code>
𐤅	<code>\AAaleph</code>	𐤆	<code>\Avav</code>	𐤇	<code>\AAkaph</code>	𐤈	<code>\Ape</code>	𐤉	<code>\Ashin</code>
𐤊	<code>\Abeth</code>	𐤋	<code>\Azayin</code>	𐤌	<code>\Alamed</code>	𐤍	<code>\AApe</code>	𐤎	<code>\Atav</code>
𐤏	<code>\AAbeth</code>	𐤐	<code>\Aheth</code>	𐤑	<code>\AAlamed</code>	𐤒	<code>\Asade</code>	𐤓	<code>\Ahelmet</code>
𐤔	<code>\Agimel</code>	𐤕	<code>\AAheth</code>	𐤖	<code>\Amem</code>	𐤗	<code>\AAsade</code>	𐤘	<code>\AAhelmet</code>
𐤙	<code>\Adaleth</code>	𐤚	<code>\Ateth</code>	𐤛	<code>\Anun</code>	𐤜	<code>\Aqoph</code>		
𐤝	<code>\AAdaleth</code>	𐤞	<code>\Ayod</code>	𐤟	<code>\Asamekh</code>	𐤠	<code>\AAqoph</code>		
𐤡	<code>\Ahe</code>	𐤢	<code>\AAyod</code>	𐤣	<code>\Aayin</code>	𐤤	<code>\Aresh</code>		

The `protosem` package defines abbreviated control sequences for each of the above. In addition, single-letter shortcuts can be used within the argument to the `\textproto` command (e.g., “`\textproto{Pakyn}`” produces “𐤑𐤕𐤂𐤅𐤊𐤛”). See the `protosem` documentation for more information.

TABLE 458: hieroglf Hieroglyphics

	<code>\HA</code>		<code>\HI</code>		<code>\Hn</code>		<code>\HT</code>
	<code>\Ha</code>		<code>\Hi</code>		<code>\HO</code>		<code>\Ht</code>
	<code>\HB</code>		<code>\Hibl</code>		<code>\Ho</code>		<code>\Htongue</code>
	<code>\Hb</code>		<code>\Hibp</code>		<code>\Hp</code>		<code>\HU</code>
	<code>\Hc</code>		<code>\Hibs</code>		<code>\HP</code>		<code>\Hu</code>
	<code>\HC</code>		<code>\Hibw</code>		<code>\Hplural</code>		<code>\HV</code>
	<code>\HD</code>		<code>\HJ</code>		<code>\Hplus</code>		<code>\Hv</code>
	<code>\Hd</code>		<code>\Hj</code>		<code>\HQ</code>		<code>\Hvbar</code>
	<code>\Hdual</code>		<code>\Hk</code>		<code>\Hq</code>		<code>\Hw</code>
	<code>\He</code>		<code>\HK</code>		<code>\Hquery</code>		<code>\HW</code>
	<code>\HE</code>		<code>\HL</code>		<code>\HR</code>		<code>\HX</code>
	<code>\Hf</code>		<code>\Hl</code>		<code>\Hr</code>		<code>\Hx</code>
	<code>\HF</code>		<code>\Hm</code>		<code>\Hs</code>		<code>\HY</code>
	<code>\HG</code>		<code>\HM</code>		<code>\HS</code>		<code>\Hy</code>
	<code>\Hg</code>		<code>\Hman</code>		<code>\Hscribe</code>		<code>\Hz</code>
	<code>\Hh</code>		<code>\Hms</code>		<code>\Hslash</code>		<code>\HZ</code>
	<code>\HH</code>		<code>\HN</code>		<code>\Hsv</code>		
	<code>\Hone</code>		<code>\Hhundred</code>		<code>\HXthousand</code>		<code>\Hmillion</code>
	<code>\Hten</code>		<code>\Hthousand</code>		<code>\HCThousand</code>		

The hieroglf package defines alternate control sequences and single-letter shortcuts for each of the above which can be used within the argument to the `\textpmhg` command (e.g., “`\textpmhg{Pakin}`” produces “”). See the hieroglf documentation for more information.

TABLE 459: linearA Linear A Script

	<code>\LinearAI</code>		<code>\LinearAXCIX</code>		<code>\LinearACXCVII</code>		<code>\LinearACCXCXV</code>
	<code>\LinearAII</code>		<code>\LinearAC</code>		<code>\LinearACXCVIII</code>		<code>\LinearACCXCXVI</code>
	<code>\LinearAIII</code>		<code>\LinearACI</code>		<code>\LinearACXCIX</code>		<code>\LinearACCXCXVII</code>
	<code>\LinearAIV</code>		<code>\LinearACII</code>		<code>\LinearACC</code>		<code>\LinearACCXCXVIII</code>
	<code>\LinearAV</code>		<code>\LinearACIII</code>		<code>\LinearACCI</code>		<code>\LinearACCXCXIX</code>

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𐀀	\LinearAVI	𐀁	\LinearACIV	𐀂	\LinearACCII	𐀃	\LinearACCC
𐀄	\LinearAVII	𐀅	\LinearACV	𐀆	\LinearACCIII	𐀇	\LinearACCCI
𐀈	\LinearAVIII	𐀉	\LinearACVI	𐀊	\LinearACCIV	𐀋	\LinearACCCII
𐀌	\LinearAIX	𐀍	\LinearACVII	𐀎	\LinearACCV	𐀏	\LinearACCCIII
𐀐	\LinearAX	𐀑	\LinearACVIII	𐀒	\LinearACCVI	𐀓	\LinearACCCIV
𐀔	\LinearAXI	𐀕	\LinearACIX	𐀖	\LinearACCVII	𐀗	\LinearACCCV
𐀘	\LinearAXII	𐀙	\LinearACX	𐀚	\LinearACCVIII	𐀛	\LinearACCCVI
𐀜	\LinearAXIII	𐀝	\LinearACXI	𐀞	\LinearACCIX	𐀟	\LinearACCCVII
𐀠	\LinearAXIV	𐀡	\LinearACXII	𐀢	\LinearACCX	𐀣	\LinearACCCVIII
𐀤	\LinearAXV	𐀥	\LinearACXIII	𐀦	\LinearACCXI	𐀧	\LinearACCCIX
𐀨	\LinearAXVI	𐀩	\LinearACXIV	𐀪	\LinearACCXII	𐀫	\LinearACCCX
𐀭	\LinearAXVII	𐀮	\LinearACXV	𐀯	\LinearACCXIII	𐀰	\LinearACCCXI
𐀲	\LinearAXVIII	𐀳	\LinearACXVI	𐀴	\LinearACCXIV	𐀵	\LinearACCCXII
𐀷	\LinearAXIX	𐀸	\LinearACXVII	𐀹	\LinearACCXV	𐀺	\LinearACCCXIII
𐀻	\LinearAXX	𐀼	\LinearACXVIII	𐀽	\LinearACCXVI	𐀾	\LinearACCCXIV
𐀿	\LinearAXXI	𐁀	\LinearACXIX	𐁁	\LinearACCXVII	𐁂	\LinearACCCXV
𐁄	\LinearAXXII	𐁅	\LinearACXX	𐁆	\LinearACCXVIII	𐁇	\LinearACCCXVI
𐁉	\LinearAXXIII	𐁊	\LinearACXXI	𐁋	\LinearACCXIX	𐁌	\LinearACCCXVII
𐁎	\LinearAXXIV	𐁏	\LinearACXXII	𐁐	\LinearACCXX	𐁑	\LinearACCCXVIII
𐁒	\LinearAXXV	𐁓	\LinearACXXIII	𐁔	\LinearACCXXI	𐁕	\LinearACCCXIX
𐁖	\LinearAXXVI	𐁗	\LinearACXXIV	𐁘	\LinearACCXXII	𐁙	\LinearACCCXX
𐁛	\LinearAXXVII	𐁜	\LinearACXXV	𐁝	\LinearACCXXIII	𐁞	\LinearACCCXXI
𐁟	\LinearAXXVIII	𐁠	\LinearACXXVI	𐁡	\LinearACCXXIV	𐁢	\LinearACCCXXII
𐁤	\LinearAXXIX	𐁥	\LinearACXXVII	𐁦	\LinearACCXXV	𐁧	\LinearACCCXXIII
𐁨	\LinearAXXX	𐁩	\LinearACXXVIII	𐁪	\LinearACCXXVI	𐁫	\LinearACCCXXIV
𐁯	\LinearAXXXI	𐁰	\LinearACXXIX	𐁱	\LinearACCXXVII	𐁲	\LinearACCCXXV
𐁴	\LinearAXXXII	𐁵	\LinearACXXX	𐁶	\LinearACCXXVIII	𐁷	\LinearACCCXXVI
𐁹	\LinearAXXXIII	𐁺	\LinearACXXXI	𐁻	\LinearACCXXIX	𐁼	\LinearACCCXXVII
𐁽	\LinearAXXXIV	𐁾	\LinearACXXXII	𐁿	\LinearACCXXX	𐂀	\LinearACCCXXVIII
𐂃	\LinearAXXXV	𐂄	\LinearACXXXIII	𐂅	\LinearACCXXXI	𐂆	\LinearACCCXXIX
𐂈	\LinearAXXXVI	𐂉	\LinearACXXXIV	𐂊	\LinearACCXXXII	𐂋	\LinearACCCXXX
𐂎	\LinearAXXXVII	𐂏	\LinearACXXXV	𐂐	\LinearACCXXXIII	𐂑	\LinearACCCXXXI
𐂔	\LinearAXXXVIII	𐂕	\LinearACXXXVI	𐂖	\LinearACCXXXIV	𐂗	\LinearACCCXXXII
𐂘	\LinearAXXXIX	𐂙	\LinearACXXXVII	𐂚	\LinearACCXXXV	𐂛	\LinearACCCXXXIII
𐂟	\LinearAXL	𐂠	\LinearACXXXVIII	𐂡	\LinearACCXXXVI	𐂢	\LinearACCCXXXIV
𐂤	\LinearAXLI	𐂥	\LinearACXXXIX	𐂦	\LinearACCXXXVII	𐂧	\LinearACCCXXXV
𐂨	\LinearAXLII	𐂩	\LinearACXL	𐂪	\LinearACCXXXVIII	𐂫	\LinearACCCXXXVI
𐂮	\LinearAXLIII	𐂯	\LinearACXLI	𐂰	\LinearACCXXXIX	𐂱	\LinearACCCXXXVII
𐂴	\LinearAXLIV	𐂵	\LinearACXLII	𐂶	\LinearACCXL	𐂷	\LinearACCCXXXVIII
𐂹	\LinearAXLV	𐂺	\LinearACXLIII	𐂻	\LinearACCXLI	𐂼	\LinearACCCXXXIX
𐂽	\LinearAXLVI	𐂾	\LinearACXLIV	𐂿	\LinearACCXLII	𐃀	\LinearACCCXL
𐃄	\LinearAXLVII	𐃅	\LinearACXLV	𐃆	\LinearACCXLIII	𐃇	\LinearACCCXLI
𐃈	\LinearAXLVIII	𐃉	\LinearACXLVI	𐃊	\LinearACCXLIV	𐃋	\LinearACCCXLII
𐃎	\LinearAXLIX	𐃏	\LinearACXLVII	𐃐	\LinearACCXLV	𐃑	\LinearACCCXLIII
𐃔	\LinearAL	𐃕	\LinearACXLVIII	𐃖	\LinearACCXLVI	𐃗	\LinearACCCXLIV

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𐀀	\LinearALI	𐀁	\LinearACXLIX	𐀂	\LinearACXLVII	𐀃	\LinearACCCXLV
𐀄	\LinearALII	𐀅	\LinearACL	𐀆	\LinearACXLVIII	𐀇	\LinearACCCXLVI
𐀈	\LinearALIII	𐀉	\LinearACLI	𐀊	\LinearACXLIX	𐀋	\LinearACCCXLVII
𐀌	\LinearALIV	𐀍	\LinearACLII	𐀎	\LinearACCL	𐀏	\LinearACCCXLVIII
𐀐	\LinearALV	𐀑	\LinearACLIII	𐀒	\LinearACCLI	𐀓	\LinearACCCXLIX
𐀔	\LinearALVI	𐀕	\LinearACLIV	𐀖	\LinearACCLII	𐀗	\LinearACCCCL
𐀘	\LinearALVII	𐀙	\LinearACLV	𐀚	\LinearACCLIII	𐀛	\LinearACCCCLI
𐀜	\LinearALVIII	𐀝	\LinearACLVI	𐀞	\LinearACCLIV	𐀟	\LinearACCCCLII
𐀠	\LinearALIX	𐀡	\LinearACLVII	𐀢	\LinearACCLV	𐀣	\LinearACCCCLIII
𐀤	\LinearALX	𐀥	\LinearACLVIII	𐀦	\LinearACCLVI	𐀧	\LinearACCCCLIV
𐀨	\LinearALXI	𐀩	\LinearACLIX	𐀪	\LinearACCLVII	𐀫	\LinearACCCCLV
𐀭	\LinearALXII	𐀮	\LinearACLX	𐀯	\LinearACCLVIII	𐀰	\LinearACCCCLVI
𐀲	\LinearALXIII	𐀳	\LinearACLXI	𐀴	\LinearACCLIX	𐀵	\LinearACCCCLVII
𐀷	\LinearALXIV	𐀸	\LinearACLXII	𐀹	\LinearACCLX	𐀺	\LinearACCCCLVIII
𐀻	\LinearALXV	𐀼	\LinearACLXIII	𐀽	\LinearACCLXI	𐀾	\LinearACCCCLIX
𐀿	\LinearALXVI	𐁀	\LinearACLXIV	𐁁	\LinearACCLXII	𐁂	\LinearACCCCLX
𐁄	\LinearALXVII	𐁅	\LinearACLXV	𐁆	\LinearACCLXIII	𐁇	\LinearACCCCLXI
𐁉	\LinearALXVIII	𐁊	\LinearACLXVI	𐁋	\LinearACCLXIV	𐁌	\LinearACCCCLXII
𐁎	\LinearALXIX	𐁏	\LinearACLXVII	𐁐	\LinearACCLXV	𐁑	\LinearACCCCLXIII
𐁒	\LinearALXX	𐁓	\LinearACLXVIII	𐁔	\LinearACCLXVI	𐁕	\LinearACCCCLXIV
𐁗	\LinearALXXI	𐁘	\LinearACLXIX	𐁙	\LinearACCLXVII	𐁚	\LinearACCCCLXV
𐁛	\LinearALXXII	𐁜	\LinearACLXX	𐁝	\LinearACCLXVIII	𐁞	\LinearACCCCLXVI
𐁠	\LinearALXXIII	𐁡	\LinearACLXXI	𐁢	\LinearACCLXIX	𐁣	\LinearACCCCLXVII
𐁤	\LinearALXXIV	𐁥	\LinearACLXXII	𐁦	\LinearACCLXX	𐁧	\LinearACCCCLXVIII
𐁨	\LinearALXXV	𐁩	\LinearACLXXIII	𐁪	\LinearACCLXXI	𐁫	\LinearACCCCLXIX
𐁭	\LinearALXXVI	𐁮	\LinearACLXXIV	𐁯	\LinearACCLXXII	𐁰	\LinearACCCCLXX
𐁴	\LinearALXXVII	𐁵	\LinearACLXXV	𐁶	\LinearACCLXXIII	𐁷	\LinearACCCCLXXI
𐁹	\LinearALXXVIII	𐁺	\LinearACLXXVI	𐁻	\LinearACCLXXIV	𐁼	\LinearACCCCLXXII
𐁿	\LinearALXXIX	𐂀	\LinearACLXXVII	𐂁	\LinearACCLXXV	𐂂	\LinearACCCCLXXIII
𐂄	\LinearALXXX	𐂅	\LinearACLXXVIII	𐂆	\LinearACCLXXVI	𐂇	\LinearACCCCLXXIV
𐂊	\LinearALXXXI	𐂋	\LinearACLXXIX	𐂌	\LinearACCLXXVII	𐂍	\LinearACCCCLXXV
𐂐	\LinearALXXXII	𐂑	\LinearACLXXX	𐂒	\LinearACCLXXVIII	𐂓	\LinearACCCCLXXVI
𐂗	\LinearALXXXIII	𐂘	\LinearACLXXXI	𐂙	\LinearACCLXXIX	𐂚	\LinearACCCCLXXVII
𐂛	\LinearALXXXIV	𐂜	\LinearACLXXXII	𐂝	\LinearACCLXXX	𐂞	\LinearACCCCLXXVIII
𐂠	\LinearALXXXV	𐂡	\LinearACLXXXIII	𐂢	\LinearACCLXXXI	𐂣	\LinearACCCCLXXIX
𐂤	\LinearALXXXVI	𐂥	\LinearACLXXXIV	𐂦	\LinearACCLXXXII	𐂧	\LinearACCCCLXXX
𐂨	\LinearALXXXVII	𐂩	\LinearACLXXXV	𐂪	\LinearACCLXXXIII	𐂫	\LinearACCCCLXXXI
𐂭	\LinearALXXXVIII	𐂮	\LinearACLXXXVI	𐂯	\LinearACCLXXXIV	𐂰	\LinearACCCCLXXXII
𐂴	\LinearALXXXIX	𐂵	\LinearACLXXXVII	𐂶	\LinearACCLXXXV	𐂷	\LinearACCCCLXXXIII
𐂹	\LinearALXXXX	𐂺	\LinearACLXXXVIII	𐂻	\LinearACCLXXXVI	𐂼	\LinearACCCCLXXXIV
𐂿	\LinearAXCI	𐃀	\LinearACLXXXIX	𐃁	\LinearACCLXXXVII	𐃂	\LinearACCCCLXXXV
𐃄	\LinearAXCII	𐃅	\LinearACLXXXX	𐃆	\LinearACCLXXXVIII	𐃇	\LinearACCCCLXXXVI
𐃊	\LinearAXCIII	𐃋	\LinearACXCI	𐃌	\LinearACCLXXXIX	𐃍	\LinearACCCCLXXXVII
𐃐	\LinearAXCIV	𐃑	\LinearACXCII	𐃒	\LinearACCLXXXX	𐃓	\LinearACCCCLXXXVIII
𐃗	\LinearAXCV	𐃘	\LinearACXCIII	𐃙	\LinearACCXCI	𐃚	\LinearACCCCLXXXIX
𐃛	\LinearAXCVI	𐃜	\LinearACXCIV	𐃝	\LinearACXCII		

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Ⲅ	<code>\LinearACVII</code>	Ⲉ	<code>\LinearACXCV</code>	Ⲋ	<code>\LinearACCXCIII</code>
Ⲍ	<code>\LinearACVIII</code>	Ⲋⲁ	<code>\LinearACXCVI</code>	Ⲋⲃ	<code>\LinearACCXCIV</code>

TABLE 460: linearb Linear B Basic and Optional Letters

Ⲁ	<code>\Ba</code>	Ⲁ	<code>\Bja</code>	Ⲁ	<code>\Bmu</code>	Ⲁ	<code>\Bpte</code>	Ⲁ	<code>\Broii</code>	Ⲁ	<code>\Bto</code>
Ⲁ	<code>\Baii</code>	Ⲁ	<code>\Bje</code>	Ⲁ	<code>\Bna</code>	Ⲁ	<code>\Bpu</code>	Ⲁ	<code>\Bru</code>	Ⲁ	<code>\Btu</code>
Ⲁ	<code>\Baiiii</code>	Ⲁ	<code>\Bjo</code>	Ⲁ	<code>\Bne</code>	Ⲁ	<code>\Bpuii</code>	Ⲁ	<code>\Bsa</code>	Ⲁ	<code>\Btwo</code>
Ⲁ	<code>\Bau</code>	Ⲁ	<code>\Bju</code>	Ⲁ	<code>\Bni</code>	Ⲁ	<code>\Bqa</code>	Ⲁ	<code>\Bse</code>	Ⲁ	<code>\Bu</code>
Ⲁ	<code>\Bda</code>	Ⲁ	<code>\Bka</code>	Ⲁ	<code>\Bno</code>	Ⲁ	<code>\Bqe</code>	Ⲁ	<code>\Bsi</code>	Ⲁ	<code>\Bwa</code>
Ⲁ	<code>\Bde</code>	Ⲁ	<code>\Bke</code>	Ⲁ	<code>\Bnu</code>	Ⲁ	<code>\Bqi</code>	Ⲁ	<code>\Bso</code>	Ⲁ	<code>\Bwe</code>
Ⲁ	<code>\Bdi</code>	Ⲁ	<code>\Bki</code>	Ⲁ	<code>\Bnwa</code>	Ⲁ	<code>\Bqo</code>	Ⲁ	<code>\Bsu</code>	Ⲁ	<code>\Bwi</code>
Ⲁ	<code>\Bdo</code>	Ⲁ	<code>\Bko</code>	Ⲁ	<code>\Bo</code>	Ⲁ	<code>\Bra</code>	Ⲁ	<code>\Bswa</code>	Ⲁ	<code>\Bwo</code>
Ⲁ	<code>\Bdu</code>	Ⲁ	<code>\Bku</code>	Ⲁ	<code>\Bpa</code>	Ⲁ	<code>\Brai</code>	Ⲁ	<code>\Bswi</code>	Ⲁ	<code>\Bza</code>
Ⲁ	<code>\Bdwe</code>	Ⲁ	<code>\Bma</code>	Ⲁ	<code>\Bpaiiii</code>	Ⲁ	<code>\Brai</code>	Ⲁ	<code>\Bta</code>	Ⲁ	<code>\Bze</code>
Ⲁ	<code>\Bdwo</code>	Ⲁ	<code>\Bme</code>	Ⲁ	<code>\Bpe</code>	Ⲁ	<code>\Bre</code>	Ⲁ	<code>\Btai</code>	Ⲁ	<code>\Bzo</code>
Ⲁ	<code>\Be</code>	Ⲁ	<code>\Bmi</code>	Ⲁ	<code>\Bpi</code>	Ⲁ	<code>\Bri</code>	Ⲁ	<code>\Bte</code>		
Ⲁ	<code>\Bi</code>	Ⲁ	<code>\Bmo</code>	Ⲁ	<code>\Bpo</code>	Ⲁ	<code>\Bro</code>	Ⲁ	<code>\Bti</code>		

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope. Single-character shortcuts are also supported: Both “`\textlinb{\Bpa\Bki\Bna}`” and “`\textlinb{pcn}`” produce “ⲉⲕⲁ”, for example. See the `linearb` documentation for more information.

TABLE 461: linearb Linear B Numerals

Ⲁ	<code>\BNi</code>	Ⲁ	<code>\BNvii</code>	Ⲁ	<code>\BNxl</code>	Ⲁ	<code>\BNc</code>	Ⲁ	<code>\BNdcc</code>
Ⲁ	<code>\BNii</code>	Ⲁ	<code>\BNviii</code>	Ⲁ	<code>\BNl</code>	Ⲁ	<code>\BNcc</code>	Ⲁ	<code>\BNdccc</code>
Ⲁ	<code>\BNiii</code>	Ⲁ	<code>\BNix</code>	Ⲁ	<code>\BNlx</code>	Ⲁ	<code>\BNccc</code>	Ⲁ	<code>\BNcm</code>
Ⲁ	<code>\BNiv</code>	Ⲁ	<code>\BNx</code>	Ⲁ	<code>\BNlxx</code>	Ⲁ	<code>\BNcd</code>	Ⲁ	<code>\BNm</code>
Ⲁ	<code>\BNv</code>	Ⲁ	<code>\BNxx</code>	Ⲁ	<code>\BNlxxx</code>	Ⲁ	<code>\BNd</code>		
Ⲁ	<code>\BNvi</code>	Ⲁ	<code>\BNxxx</code>	Ⲁ	<code>\BNxc</code>	Ⲁ	<code>\BNdc</code>		

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope.

TABLE 462: linearb Linear B Weights and Measures

	<code>\BPtalent</code>		<code>\BPvolb</code>		<code>\BPvolcf</code>		<code>\BPwtb</code>		<code>\BPwtd</code>
	<code>\BPvola</code>		<code>\BPvolcd</code>		<code>\BPwta</code>		<code>\BPwtc</code>		

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope.

TABLE 463: linearb Linear B Ideograms

	<code>\BPamphora</code>		<code>\BPchassis</code>		<code>\BPman</code>		<code>\BPwheat</code>
	<code>\BParrow</code>		<code>\BPcloth</code>		<code>\BPnanny</code>		<code>\BPwheel</code>
	<code>\BPbarley</code>		<code>\BPcow</code>		<code>\BPolive</code>		<code>\BPwine</code>
	<code>\BPbilly</code>		<code>\BPCup</code>		<code>\BPox</code>		<code>\BPwineeih</code>
	<code>\BPboar</code>		<code>\BPewe</code>		<code>\BPpig</code>		<code>\BPwineiih</code>
	<code>\BPbronze</code>		<code>\BPfoal</code>		<code>\BPram</code>		<code>\BPwineivh</code>
	<code>\BPbull</code>		<code>\BPgoat</code>		<code>\BPsheep</code>		<code>\BPwoman</code>
	<code>\BPcauldroni</code>		<code>\BPgoblet</code>		<code>\BPsow</code>		<code>\BPwool</code>
	<code>\BPcauldronii</code>		<code>\BPgold</code>		<code>\BPspear</code>		
	<code>\BPchariot</code>		<code>\BPhorse</code>		<code>\BPsword</code>		

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope.

TABLE 464: linearb Unidentified Linear B Symbols

	<code>\BUi</code>		<code>\BUiv</code>		<code>\BUvii</code>		<code>\BUx</code>		<code>\Btwe</code>
	<code>\BUii</code>		<code>\BUv</code>		<code>\BUviii</code>		<code>\BUxi</code>		
	<code>\BUiii</code>		<code>\BUvi</code>		<code>\BUix</code>		<code>\BUxii</code>		

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope.



TABLE 465: cypriot Cypriot Letters

✱	\Ca	✱	\Cku	✱	\Cmu	⤴	\Cpo	≡	\Cso	⋈	\Cwi
✱	\Ce	∇	\Cla	⤴	\Cna	⤴	\Cpu	⋈	\Csu	⤴	\Cwo
⋈	\Cga	∞	\Cle	⤴	\Cne	⤴	\Cra	⤴	\Cta	)	\Cxa
✱	\Ci	≤	\Cli	⤴	\Cni	⤴	\Cre	⤴	\Cte	(	\Cxe
∅	\Cja	+	\Clo	⤴	\Cno	⤴	\Cri	↑	\Cti	∅	\Cya
∞	\Cjo	∅	\Clu	⋈	\Cnu	⋈	\Cro	⤴	\Cto	∞	\Cyo
⤴	\Cka	✱	\Cma	≡	\Co	)	\Cru	⤴	\Ctu	⋈	\Cza
⋈	\Cke	✱	\Cme	⋈	\Cpa	∇	\Csa	⤴	\Cu	⋈	\Czo
⤴	\Cki	∇	\Cmi	⋈	\Cpe	⤴	\Cse	⋈	\Cwa		
∩	\Cko	∅	\Cmo	≡	\Cpi	⤴	\Csi	⤴	\Cwe		

These symbols must appear either within the argument to `\textcypr` or following the `\cyprfamily` font-selection command within a scope. Single-character shortcuts are also supported: Both “`\textcypr{\Cpa\Cki\Cna}`” and “`\textcypr{pcn}`” produce “`⋈⤴⤴`”, for example. See the cypriot documentation for more information.

TABLE 466: sarabian South Arabian Letters

◦	\SAa	⋈	\SAz	⋈	\SAm	⋈	\SAsd	⋈	\Sadb
∩	\SAb	⋈	\SAhd	⋈	\SAn	⋈	\SAq	⋈	\SAtb
∩	\SAg	∩	\SAtd	⋈	\SAs	⋈	\SAr	∩	\SAGA
⋈	\SAd	⋈	\SAy	⋈	\SAf	⋈	\SAsv	⋈	\SAzd
⋈	\SAh	⋈	\SAk	⋈	\SAlq	⋈	\SAt	⋈	\SAsa
∅	\SAw	∩	\SAl	⋈	\SAo	⋈	\SAhu	∩	\SAdd

These symbols must appear either within the argument to `\textsarab` or following the `\sarabfamily` font-selection command within a scope. Single-character shortcuts are also supported: Both “`\textsarab{\SAb\Sak\SAn}`” and “`\textsarab{bkn}`” produce “`∩∩∩`”, for example. See the sarabian documentation for more information.

TABLE 467: teubner Archaic Greek Letters and Greek Numerals

Ϟ	<code>\Coppa<sup>†</sup></code>	Ϝ	<code>\Digamma*</code>	Ϛ	<code>\sampi*</code>	ϙ	<code>\varstigma</code>
ϙ	<code>\coppa<sup>†</sup></code>	ϝ	<code>\koppa*</code>	ϛ	<code>\Stigma</code>		
ϝ	<code>\digamma*,<sup>‡</sup></code>	Ϟ	<code>\Sampi</code>	ϙ	<code>\stigma*</code>		

\* Technically, these symbols do not require `teubner`; it is sufficient to load the `babel` package with the `greek` option (upon which `teubner` depends)—but use `\qoppa` for `\koppa` and `\ddigamma` for `\digamma`.































<sup>†</sup> For compatibility with other naming conventions `teubner` defines `\Koppa` as a synonym for `\Coppa` and `\varcoppa` as a synonym for `\coppa`.

<sup>‡</sup> If both `teubner` and `amssymb` are loaded, `teubner`'s `\digamma` replaces `amssymb`'s `\digamma`, regardless of package-loading order.

TABLE 468: boisik Archaic Greek Letters and Greek Numerals


























































Ϝ	<code>\Digamma</code>	ϙ	<code>\qoppa</code>	ϙ	<code>\stigma</code>	Ϛ	<code>\varsampi</code>
ϝ	<code>\digamma</code>	Ϟ	<code>\Qoppa</code>	ϛ	<code>\Stigma</code>		
Ϛ	<code>\heta</code>	Ϟ	<code>\Sampi</code>	ϝ	<code>\vardigamma</code>		
ϛ	<code>\Heta</code>	Ϛ	<code>\sampi</code>	Ϛ	<code>\Varsampi</code>		

TABLE 469: epiolmec Epi-Olmec Script

	<code>\EOafter</code>		<code>\EOMiddle</code>		<code>\EOStarWarrior</code>
	<code>\EOandThen</code>		<code>\EOmonster</code>		<code>\EOstep</code>
	<code>\EOAppear</code>		<code>\EOMountain</code>		<code>\EOSu</code>
	<code>\EOBeardMask</code>		<code>\EOMuu</code>		<code>\EOsu</code>
	<code>\EOBedeck</code>		<code>\EOna</code>		<code>\EOSun</code>
	<code>\EOBlood</code>		<code>\EOne</code>		<code>\EOSuu</code>
	<code>\EObrace</code>		<code>\EOni</code>		<code>\EOSuu</code>
	<code>\EObuilding</code>		<code>\EOnow</code>		<code>\E0ta</code>
	<code>\EOBundle</code>		<code>\EOnu</code>		<code>\E0te</code>
	<code>\EOChop</code>		<code>\EOnuu</code>		<code>\EOthrone</code>

(continued on next page)

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	\EOChronI		\EOofficerI		\EOti
	\EOCloth		\EOofficerII		\EOtime
	\EODealWith		\EOofficerIII		\EOTime
	\EODeer		\EOofficerIV		\EOTitle
	\EOeat		\EOPA		\EOTitleII
	\EOflint		\EOPak		\EOTitleIV
	\EOflower		\EOPatron		\EOto
	\EOFold		\EOPatronII		\EOtu
	\EOGod		\EOpe		\EOtuki
	\EOGoUp		\EOOpenis		\EOtukpa
	\EOgovernor		\EOpi		\EOturtle
	\EOGuise		\EOPierce		\EOtuu
	\EOHallow		\EOPlant		\EOtza
	\EOja		\EOPlay		\EOtze
	\EOjaguar		\EOpo		\EOtzetze
	\EOje		\EOpriest		\EOtzi
	\EOji		\EOPrince		\EOtzu
	\EOJI		\EOpu		\EOtzuu
	\EOjo		\EOpuu		\EOundef
	\EOju		\EOpuuk		\EOvarBeardMask
	\EOkak		\EORain		\EOvarja
	\EOke		\EOSa		\EOvarji
	\EOki		\EOsa		\EOvarki
	\EOkij		\EOSacrifice		\EOvarkuu
	\EOKing		\EOSaw		\EOvarni
	\EOknottedCloth		\EOScorpious		\EOvarpa

*(continued on next page)*

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	\EOknottedClothStraps		\EOset		\EOvarSi
	\EOko		\EOsi		\EOvarsi
	\EOku		\EOSi		\EOvartza
	\EOkuu		\EOSing		\EOvarwuu
	\EOLetBlood		\EOSini		\EOvarYear
	\EOloinCloth		\EOSkin		\EOwa
	\EOlongLipII		\EOSky		\EOwe
	\EOLord		\EOskyAnimal		\EOwi
	\EOLose		\EOskyPillar		\EOwo
	\EOma		\EOSnake		\EOwuu
	\EOMacaw		\EOSo		\EOya
	\EOMacawI		\EOSpan		\EOyaj
	\EOme		\EOSprinkle		\EOye
	\EOMexNew		\EOstar		\EOYear
	\EOmi		\EOstarWarrior		\EOyuu

TABLE 470: epiolmec Epi-Olmec Numerals

	\EOzero		\EOvi		\EOxii		\EOxviii
	\EOi		\EOvii		\EOxiii		\EOxix
	\EOii		\EOviii		\EOxiv		\EOxx
	\EOiii		\EOix		\EOxv		
	\EOiv		\EOx		\EOxvi		
	\EOv		\EOxi		\EOxvii		

TABLE 471: allrunes Runes

þ	\a	ƿ	E	ϕ	\ING	𐌞	m	ŕ	R	⋈	\sthree
*	\A	ƿ	F	ϕ	\ing	†	n	⋈	\RR	†	T
ƿ	a	ƿ	f	ϕ	\Ing	◻	\NG	⋈	\s	↑	t
⋈	A	X	g	∞	\j	◊	\ng	⋈	s	⋈	\textsection
β	b	H	\h	∞	j	⊗	o	⋈	S	þ	\th
β	B	N	H	⋈	J	⋈	\p	⋈	\seight	Λ	U
⋈	\d	H	h	∞	\k	⋈	p	⋈	\sfive	∩	u
◻	D	β	\i	∞	\K	⋈	P	⋈	\sfour	þ	w
⋈	d	l	i	<	k	⋈	\R	⋈	\sseven		
⋈	e	⋈	I	†	l	R	r	⋈	\ssix		

The symbols in this table should appear within the argument to `\textarc` (for common Germanic runes), `\textara` (for Anglo-Frisian runes), `\textarn` (for normal runes), `\textart` (for short-twig runes), `\textarl` (for staveless runes), `\textarm` (for medieval runes), or within a scope that sets, respectively, `\arcfamily`, `\arafamily`, `\arnfamily`, `\artfamily`, `\arlfamily`, or `\armfamily`. Each family presents slightly different glyphs and/or slightly different subsets of the available runes. (The table presents the common Germanic runes.) See the `allrunes` documentation for more information.

TABLE 472: allrunes Rune Separators

†	\bar	:	\doubleeye	+	\plus	:	\triplidot
*	\cross	‡	\doubleplus	:	\quaddot	∞	\tripleeye
.	\dot	⋈	\doublestar	∞	\quadeye	‡	\tripleplus
†	\doublebar	.	\eye	*	\star		
⋈	\doublecross	:	\pentdot	†	\triplebar		
:	\doubledot	∞	\penteye	⋈	\triplecross		

See the usage comment under Table 471 on page 211.

## Chapter 7

# Musical symbols

The following symbols are used to typeset musical notation. The *lilyglyphs* package provides a large subset of the symbols in this chapter. Note, however, that *lilyglyphs* depends upon the *fontspec* package, OpenType (*.otf*) fonts, and some PDF graphics and therefore works only with Lua $\LaTeX$  or Xe $\LaTeX$ .

A simple way to typeset time signatures, due to Daniel Hirst, is to attach a superscript and a subscript to an empty math object. For example,  $\{\}^3_4$  renders as “ $\frac{3}{4}$ ”. Because superscripts and subscripts are left-justified, some extra padding may need to be added if the beats per measure and beat unit contain different numbers of digits. A 5 mu space (“\;”) vertically centers the “8” relative to the “12” in  $\{\}^{\!12}_{\!8}$  (“ $\frac{12}{8}$ ”). For boldface time signatures (e.g., “ $\frac{4}{4}$ ”), consider the boldface-math options presented in Section 12.5. See also Table 486.

TABLE 473:  $\LaTeX 2\epsilon$  Musical Symbols

$\flat$  \flat  $\natural$  \natural  $\sharp$  \sharp

TABLE 474: textcomp Musical Symbols

$\text{♪}$  \textmusicalnote

TABLE 475: wasysym Musical Symbols

$\text{♪}$  \eighthnote  $\text{♪}$  \halfnote  $\text{♪♪}$  \twonotes  $\text{♩}$  \fullnote  $\text{♪}$  \quarternote

TABLE 476: MnSymbol Musical Symbols

$\flat$  \flat  $\natural$  \natural  $\sharp$  \sharp

TABLE 477: fdsymbol Musical Symbols

`b` `\flat` `♮` `\natural` `#` `\sharp`

TABLE 478: boisik Musical Symbols

`b` `\flat` `♮` `\natural` `#` `\sharp`

TABLE 479: stix Musical Symbols

`♪` `\eighthnote` `♮` `\natural` `#` `\sharp`  
`b` `\flat` `♪` `\quarternote` `♪♪` `\twonotes`

TABLE 480: arev Musical Symbols























































`♪` `\quarternote` `♪` `\eighthnote` `♪♪` `\sixteenthnote`

TABLE 481: utfsym Musical Symbols

`♪` `\usym{2669}` `♪♪` `\usym{266C}` `#` `\usym{266F}` `♯` `\usym{1F3B5}`  
`♭` `\usym{266A}` `b` `\usym{266D}` `♪` `\usym{1F39C}` `♪♪` `\usym{1F3B6}`  
`♮` `\usym{266B}` `♮` `\usym{266E}` `♪` `\usym{1F39D}` `♯` `\usym{1F3BC}`

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.





TABLE 482: MusiX<sub>TEX</sub> Musical Symbols

	<code>\allabreve</code>		<code>\lsf</code>		<code>\shake</code>
	<code>\altoclef</code>		<code>\lsfz</code>		<code>\Shake</code>
	<code>\backturn</code>		<code>\maxima</code>		<code>\Shakel</code>
	<code>\bassclef</code>		<code>\meterplus</code>		<code>\Shakene</code>
	<code>\caesura</code>		<code>\mordent</code>		<code>\Shakenw</code>
	<code>\coda</code>		<code>\Mordent</code>		<code>\Shakesw</code>
	<code>\Coda</code>		<code>\PAUSE</code>		<code>\smallaltoclef</code>
	<code>\Dep</code>		<code>\PAUSE</code>		<code>\smallbassclef</code>
	<code>\doublethumb</code>		<code>\pause</code>		<code>\smalltrebleclef</code>
	<code>\downbow</code>		<code>\Ped</code>		<code>\sPed</code>
	<code>\ds</code>		<code>\qp</code>		<code>\trebleclef</code>
	<code>\duevolte</code>		<code>\qqs</code>		<code>\trill</code>
	<code>\fermatadown</code>		<code>\qs</code>		<code>\turn</code>
	<code>\fermataup</code>		<code>\reverseallabreve</code>		<code>\upbow</code>
	<code>\flageolett</code>		<code>\reverseC</code>		<code>\usf</code>
	<code>\hpause</code>		<code>\sDep</code>		<code>\usfz</code>
	<code>\hs</code>		<code>\Segno</code>		<code>\wq</code>
	<code>\longa</code>		<code>\segno</code>		<code>\bwq</code>

All of these symbols are intended to be used in the context of typesetting musical scores. See the MusiX<sub>TEX</sub> documentation for more information.






























TABLE 483: MusiX<sub>TEX</sub> Alternative Clefs

	<code>\drumclef</code>		<code>\gregorianFclef</code>
	<code>\gregorianCclef</code>		<code>\oldGclef</code>





















In addition to MusiX<sub>TEX</sub>, `\drumclef` requires the `musixper` package; `\oldGclef` requires the `musixlit` package; and both `\gregorianCclef` and `\gregorianFclef` require the `musixgre` package. Together with MusiX<sub>TEX</sub>, these packages provide a complete system for typesetting percussion notation (`musixper`), liturgical music (`musixlit`), and Gregorian chants (`musixgre`, including the staves and all of the necessary neumes. See the MusiX<sub>TEX</sub> documentation for more information.

TABLE 484: harmony Musical Symbols

	<code>\AAcht</code>		<code>\DDohne</code>		<code>\Halb</code>		<code>\SechBR</code>		<code>\VM</code>
	<code>\Acht</code>		<code>\Dohne</code>		<code>\HaPa</code>		<code>\SechBr</code>		<code>\Zwdr</code>
	<code>\AchtBL</code>		<code>\Ds</code>		<code>\Pu</code>		<code>\SePa</code>		<code>\ZwPa</code>
	<code>\AchtBR</code>		<code>\DS</code>		<code>\Sech</code>		<code>\UB</code>		
	<code>\AcPa</code>		<code>\Ganz</code>		<code>\SechBL</code>		<code>\Vier</code>		
	<code>\DD</code>		<code>\GaPa</code>		<code>\SechBl</code>		<code>\ViPa</code>		

The MusiX<sub>TEX</sub> package must be installed to use `harmony`.







TABLE 485: musicography Musical Symbols

	<code>\musDoubleFlat</code>		<code>\musNatural</code>		<code>\musSixtyFourth</code>
	<code>\musDoubleSharp</code>		<code>\musQuarter</code>		<code>\musSixtyFourthDotted</code>
	<code>\musEighth</code>		<code>\musQuarterDotted</code>		<code>\musThirtySecond</code>
	<code>\musEighthDotted</code>		<code>\musSegno</code>		<code>\musThirtySecondDotted</code>
	<code>\musFlat</code>		<code>\musSharp</code>		<code>\musWhole</code>
	<code>\musHalf</code>		<code>\musSixteenth</code>		<code>\musWholeDotted</code>
	<code>\musHalfDotted</code>		<code>\musSixteenthDotted</code>		

musicography defines `\fl`, `\sh`, and `\na` as shorthands for `\musFlat`, `\musSharp`, and `\musNatural`, respectively. It also defines `\musCorchea` as an alias for `\musEighth`, `\musCorcheaDotted` as an alias for `\musEighthDotted`, `\musFusa` as an alias for `\musEighth`, `\musFusaDotted` as an alias for `\musEighthDotted`, `\musMinim` as an alias for `\musHalf`, `\musMinimDotted` as an alias for `\musHalfDotted`, `\musSemibreve` as an alias for `\musWhole`, `\musSemibreveDotted` as an alias for `\musWholeDotted`, `\musSemiminim` as an alias for `\musQuarter`, and `\musSeminiminimDotted` as an alias for `\musQuarterDotted`.

The M<sub>u</sub>siX<sub>T</sub>E<sub>X</sub> package must be installed to use musicography.

TABLE 486: musicography Time Signatures

	<code>\meterC</code>		<code>\meterCThreeTwo</code>		<code>\meterCZ</code>
	<code>\meterCThree</code>		<code>\meterCutC</code>		<code>\meter0</code>

Other time signatures can be specified with `\musMeter`, as in

$$\text{\musMeter}\{2\}\{4\} \rightarrow \frac{2}{4}$$

The M<sub>u</sub>siX<sub>T</sub>E<sub>X</sub> package must be installed to use musicography.

TABLE 487: harmony Musical Accents

































$\hat{A}\hat{a}$	<code>\Ferli{A}\Ferli{a}</code> *	$\overset{\frown}{A}\overset{\frown}{a}$	<code>\Ohne{A}\Ohne{a}</code> *
$\widehat{A}\widehat{a}$	<code>\Fermi{A}\Fermi{a}</code>	$\overline{A a}$	<code>\Umd{A}\Umd{a}</code> *
$\textcircled{A}\textcircled{a}$	<code>\Kr{A}\Kr{a}</code>		

\* These symbols take an optional argument which shifts the accent either horizontally or vertically (depending on the command) by the given distance.

In addition to the accents shown above, `\HH` is a special accent command that accepts five period-separated characters and typesets them such that “`\HH.X.a.b.c.d.`” produces “ $X_a^b$ ”. All arguments except the first can be omitted: “`\HH.X....`” produces “ $X$ ”. `\Takt` takes two arguments and composes them into a musical time signature. For example, “`\Takt{12}{8}`” produces “ $\frac{12}{8}$ ”. As two special cases, “`\Takt{c}{0}`” produces “ $\mathbf{C}$ ” and “`\Takt{c}{1}`” produces “ $\mathbf{C}$ ”.

The MusiX<sub>TEX</sub> package must be installed to use harmony.

TABLE 488: *lily<sub>g</sub>ly<sub>p</sub>bs* Single Notes

	<code>\eighthNote</code>		<code>\quarterNoteDottedDown</code>
	<code>\eighthNoteDotted</code>		<code>\quarterNoteDown</code>
	<code>\eighthNoteDottedDouble</code>		<code>\sixteenthNote</code>
	<code>\eighthNoteDottedDoubleDown</code>		<code>\sixteenthNoteDotted</code>
	<code>\eighthNoteDottedDown</code>		<code>\sixteenthNoteDottedDouble</code>
	<code>\eighthNoteDown</code>		<code>\sixteenthNoteDottedDoubleDown</code>
	<code>\halfNote</code>		<code>\sixteenthNoteDottedDown</code>
	<code>\halfNoteDotted</code>		<code>\sixteenthNoteDown</code>
	<code>\halfNoteDottedDouble</code>		<code>\thirtysecondNote</code>
	<code>\halfNoteDottedDoubleDown</code>		<code>\thirtysecondNoteDotted</code>
	<code>\halfNoteDottedDown</code>		<code>\thirtysecondNoteDottedDouble</code>
	<code>\halfNoteDown</code>		<code>\thirtysecondNoteDottedDoubleDown</code>
	<code>\quarterNote</code>		<code>\thirtysecondNoteDottedDown</code>
	<code>\quarterNoteDotted</code>		<code>\thirtysecondNoteDown</code>
	<code>\quarterNoteDottedDouble</code>		<code>\wholeNote</code>
	<code>\quarterNoteDottedDoubleDown</code>		<code>\wholeNoteDotted</code>

*lily<sub>g</sub>ly<sub>p</sub>bs* defines synonyms for all of the preceding symbols:

































	<code>\crotchet</code>		<code>\minimDottedDown</code>
	<code>\crotchetDotted</code>		<code>\minimDown</code>
	<code>\crotchetDottedDouble</code>		<code>\quaver</code>
	<code>\crotchetDottedDoubleDown</code>		<code>\quaverDotted</code>
	<code>\crotchetDottedDown</code>		<code>\quaverDottedDouble</code>
	<code>\crotchetDown</code>		<code>\quaverDottedDoubleDown</code>
	<code>\demisemiquaver</code>		<code>\quaverDottedDown</code>
	<code>\demisemiquaverDotted</code>		<code>\quaverDown</code>
	<code>\demisemiquaverDottedDouble</code>		<code>\semibreve</code>
	<code>\demisemiquaverDottedDoubleDown</code>		<code>\semibreveDotted</code>
	<code>\demisemiquaverDottedDown</code>		<code>\semiquaver</code>
	<code>\demisemiquaverDown</code>		<code>\semiquaverDotted</code>
	<code>\minim</code>		<code>\semiquaverDottedDouble</code>
	<code>\minimDotted</code>		<code>\semiquaverDottedDoubleDown</code>
	<code>\minimDottedDouble</code>		<code>\semiquaverDottedDown</code>
	<code>\minimDottedDoubleDown</code>		<code>\semiquaverDown</code>

TABLE 489: *lily<sub>g</sub>ly<sub>p</sub>bs* Beamed Notes









	<code>\twoBeamedQuavers</code>		<code>\threeBeamedQuaversII</code>
	<code>\threeBeamedQuavers</code>		<code>\threeBeamedQuaversIII</code>
	<code>\threeBeamedQuaversI</code>		

TABLE 490: *lily<sub>g</sub>ly<sub>p</sub>bs* Clefs

	<code>\clefC</code>		<code>\clefF</code>		<code>\clefG</code>
---	---------------------	---	---------------------	---	---------------------

Each of these symbols provides a smaller, “inline” form (`\clefCInline`, `\clefFInline`, and `\clefGInline`, respectively) intended for use within a paragraph. See the *lily<sub>g</sub>ly<sub>p</sub>bs* documentation for more information.

TABLE 491: *lilypond* Time Signatures

<b>C</b>	<code>\lilyTimeC</code>	<b>Ⓒ</b>	<code>\lilyTimeCHalf</code>
----------	-------------------------	----------	-----------------------------

*lilypond* also provides a `\lilyTimeSignature` command that lets a user typeset single and compound time signatures by specifying a numerator and a denominator. See the *lilypond* documentation for more information.

TABLE 492: *lilypond* Accidentals

<b>⦿</b>	<code>\doublesharp</code>	<b>⚡</b>	<code>\sharpArrowdown</code>
<b>b</b>	<code>\flat</code>	<b>⚡</b>	<code>\sharpArrowup</code>
<b>♭♭</b>	<code>\flatflat</code>	<b>⚡</b>	<code>\sharpSlashslashslashStem</code>
<b>♮</b>	<code>\natural</code>	<b>⚡</b>	<code>\sharpSlashslashslashStemstem</code>
<b>#</b>	<code>\sharp</code>	<b>⚡</b>	<code>\sharpSlashslashStem</code>
<b>⚡</b>	<code>\sharpArrowboth</code>	<b>⚡</b>	<code>\sharpSlashslashStemstemstem</code>

TABLE 493: *lilypond* Rests

<b>⏏</b>	<code>\crotchetRest</code>	<b>7.</b>	<code>\quaverRestDotted</code>
<b>⏏.</b>	<code>\crotchetRestDotted</code>	<b>7̣</b>	<code>\semiquaverRest</code>
<b>—</b>	<code>\halfNoteRest</code>	<b>7.</b>	<code>\semiquaverRestDotted</code>
<b>—.</b>	<code>\halfNoteRestDotted</code>	<b>—</b>	<code>\wholeNoteRest</code>
<b>7</b>	<code>\quaverRest</code>	<b>—.</b>	<code>\wholeNoteRestDotted</code>

Multiply dotted rests can be produced with the `\lilyPrintMoreDots` command. See the *lilypond* documentation for more information.

TABLE 494: *lilypond* Dynamics Letters

<b><i>f</i></b>	<code>\lilyDynamics{f}</code>	<b><i>r</i></b>	<code>\lilyDynamics{r}</code>
<b><i>p</i></b>	<code>\lilyDynamics{p}</code>	<b><i>s</i></b>	<code>\lilyDynamics{s}</code>
<b><i>m</i></b>	<code>\lilyDynamics{m}</code>	<b><i>z</i></b>	<code>\lilyDynamics{z}</code>
<b><i>rf</i></b>	<code>\lilyRF</code>	<b><i>rfz</i></b>	<code>\lilyRFZ</code>

These letters and the digits 0–9 are the only alphanumerics defined by *lilypond*'s underlying Emmentaler fonts.

TABLE 495: *lilyglyphs* Dynamics Symbols

$\langle$	<code>\crescHairpin</code>	$\rangle$	<code>\decrecHairpin</code>
-----------	----------------------------	-----------	-----------------------------

TABLE 496: *lilyglyphs* Articulations

$>$	<code>\lilyAccent</code>	$\wedge$	<code>\marcato</code>	$\cdot$	<code>\staccatissimo</code>
$\langle \rangle$	<code>\lilyEspressivo</code>	$\nabla$	<code>\marcatoDown</code>	$-$	<code>\tenuto</code>
$\cdot$	<code>\lilyStaccato</code>	$\pm$	<code>\portato</code>		
$\circ$	<code>\lilyThumb</code>	$\bar{-}$	<code>\portatoDown</code>		

TABLE 497: *lilyglyphs* Scripts

$\frown$	<code>\fermata</code>
----------	-----------------------

TABLE 498: *lilyglyphs* Accordion Notation








































































$\boxplus$	<code>\accordionBayanBass</code>	$\otimes$	<code>\accordionOldEE</code>	$\oplus$	<code>\accordionStdBass</code>
$\ominus$	<code>\accordionDiscant</code>	$\upharpoonright$	<code>\accordionPull</code>		
$\ominus$	<code>\accordionFreeBass</code>	$\succ$	<code>\accordionPush</code>		

TABLE 499: *lilyglyphs* Named Time Signatures

$\textcircled{C}$	<code>\lilyGlyph{timesig.C22}</code>	$\textcircled{\phi}$	<code>\lilyGlyph{timesig.mensural98}</code>
$\textcircled{C}$	<code>\lilyGlyph{timesig.C44}</code>	$\textcircled{C}$	<code>\lilyGlyph{timesig.neomensural22}</code>
$\textcircled{\phi}$	<code>\lilyGlyph{timesig.mensural22}</code>	$\textcircled{D}$	<code>\lilyGlyph{timesig.neomensural24}</code>
$\textcircled{\phi}$	<code>\lilyGlyph{timesig.mensural24}</code>	$\textcircled{O}$	<code>\lilyGlyph{timesig.neomensural32}</code>
$\textcircled{O}$	<code>\lilyGlyph{timesig.mensural32}</code>	$\textcircled{\textcircled{O}}$	<code>\lilyGlyph{timesig.neomensural34}</code>
$\textcircled{\phi}$	<code>\lilyGlyph{timesig.mensural34}</code>	$\textcircled{C}$	<code>\lilyGlyph{timesig.neomensural44}</code>
$\textcircled{C}$	<code>\lilyGlyph{timesig.mensural44}</code>	$\textcircled{C}$	<code>\lilyGlyph{timesig.neomensural48}</code>
$\textcircled{C}$	<code>\lilyGlyph{timesig.mensural48}</code>	$\textcircled{C}$	<code>\lilyGlyph{timesig.neomensural64}</code>
$\textcircled{C}$	<code>\lilyGlyph{timesig.mensural64}</code>	$\textcircled{C}$	<code>\lilyGlyph{timesig.neomensural68}</code>
$\textcircled{\phi}$	<code>\lilyGlyph{timesig.mensural68}</code>	$\textcircled{\textcircled{C}}$	<code>\lilyGlyph{timesig.neomensural68alt}</code>
$\textcircled{\textcircled{C}}$	<code>\lilyGlyph{timesig.mensural68alt}</code>	$\textcircled{\textcircled{O}}$	<code>\lilyGlyph{timesig.neomensural94}</code>
$\textcircled{\textcircled{O}}$	<code>\lilyGlyph{timesig.mensural94}</code>	$\textcircled{\textcircled{\textcircled{O}}}$	<code>\lilyGlyph{timesig.neomensural98}</code>

*lilyglyphs* defines shorter names for a few of these symbols. See Table 491.

TABLE 500: *lilyglyphs* Named Scripts

	<code>\lilyGlyph{scripts.arpeggio}</code>		<code>\lilyGlyph{scripts.prallmordent}</code>
	<code>\lilyGlyph{scripts.arpeggio.arrow.1}</code>		<code>\lilyGlyph{scripts.prallprall}</code>
	<code>\lilyGlyph{scripts.arpeggio.arrow.M1}</code>		<code>\lilyGlyph{scripts.prallup}</code>
	<code>\lilyGlyph{scripts.augmentum}</code>		<code>\lilyGlyph{scripts.rcomma}</code>
	<code>\lilyGlyph{scripts.barline.kievian}</code>		<code>\lilyGlyph{scripts.reverseturn}</code>
	<code>\lilyGlyph{scripts.caesura.curved}</code>		<code>\lilyGlyph{scripts.rvarcomma}</code>
	<code>\lilyGlyph{scripts.caesura.straight}</code>		<code>\lilyGlyph{scripts.segno}</code>
	<code>\lilyGlyph{scripts.circulus}</code>		<code>\lilyGlyph{scripts.sforzato}</code>
	<code>\lilyGlyph{scripts.coda}</code>		<code>\lilyGlyph{scripts.snappizzicato}</code>
	<code>\lilyGlyph{scripts.daccentus}</code>		<code>\lilyGlyph{scripts.staccato}</code>
	<code>\lilyGlyph{scripts.dfermata}</code>		<code>\lilyGlyph{scripts.stopped}</code>
	<code>\lilyGlyph{scripts.dlongfermata}</code>		<code>\lilyGlyph{scripts.tenuto}</code>
	<code>\lilyGlyph{scripts.dmarcato}</code>		<code>\lilyGlyph{scripts.thumb}</code>
	<code>\lilyGlyph{scripts.downbow}</code>		<code>\lilyGlyph{scripts.tickmark}</code>
	<code>\lilyGlyph{scripts.downmordent}</code>		<code>\lilyGlyph{scripts.trilelement}</code>
	<code>\lilyGlyph{scripts.downprall}</code>		<code>\lilyGlyph{scripts.trill}</code>
	<code>\lilyGlyph{scripts.dpedalheel}</code>		<code>\lilyGlyph{scripts.trill_element}</code>
	<code>\lilyGlyph{scripts.dpedaltoe}</code>		<code>\lilyGlyph{scripts.turn}</code>
	<code>\lilyGlyph{scripts.dportato}</code>		<code>\lilyGlyph{scripts.uaccentus}</code>
	<code>\lilyGlyph{scripts.dsemicirculus}</code>		<code>\lilyGlyph{scripts.ufermata}</code> *
	<code>\lilyGlyph{scripts.dshortfermata}</code>		<code>\lilyGlyph{scripts.ulongfermata}</code>
	<code>\lilyGlyph{scripts.dsignumcongruentiae}</code>		<code>\lilyGlyph{scripts.umarcato}</code>
	<code>\lilyGlyph{scripts.dstaccatissimo}</code>		<code>\lilyGlyph{scripts.upbow}</code>
	<code>\lilyGlyph{scripts.dverylongfermata}</code>		<code>\lilyGlyph{scripts.upedalheel}</code>
	<code>\lilyGlyph{scripts.espr}</code>		<code>\lilyGlyph{scripts.upedaltoe}</code>
	<code>\lilyGlyph{scripts.flageolet}</code>		<code>\lilyGlyph{scripts.upmordent}</code>
	<code>\lilyGlyph{scripts.halfopen}</code>		<code>\lilyGlyph{scripts.uportato}</code>
	<code>\lilyGlyph{scripts.halfopenvertical}</code>		<code>\lilyGlyph{scripts.upprall}</code>
	<code>\lilyGlyph{scripts.ictus}</code>		<code>\lilyGlyph{scripts.usemicirculus}</code>
	<code>\lilyGlyph{scripts.lcomma}</code>		<code>\lilyGlyph{scripts.ushortfermata}</code>
	<code>\lilyGlyph{scripts.lineprall}</code>		<code>\lilyGlyph{scripts.usignumcongruentiae}</code>
	<code>\lilyGlyph{scripts.lvarcomma}</code>		<code>\lilyGlyph{scripts.ustaccatissimo}</code>
	<code>\lilyGlyph{scripts.mordent}</code>		<code>\lilyGlyph{scripts.uverylongfermata}</code>
	<code>\lilyGlyph{scripts.open}</code>		<code>\lilyGlyph{scripts.varcoda}</code>
	<code>\lilyGlyph{scripts.prall}</code>		<code>\lilyGlyph{scripts.varsegno}</code>
	<code>\lilyGlyph{scripts.pralldown}</code>		


\* *lilyglyphs* defines `\fermata` as a shorter name for “” than `\lilyGlyph{scripts.ufermata}`. See Table 497.

TABLE 501: *lilyglyphs* Named Rests

—	<code>\lilyGlyph{rests.0}</code>	⋈	<code>\lilyGlyph{rests.4mensural}</code>
·	<code>\lilyGlyph{rests.0mensural}</code>	⋈	<code>\lilyGlyph{rests.4neomensural}</code>
·	<code>\lilyGlyph{rests.0neomensural}</code>	⋈	<code>\lilyGlyph{rests.5}</code>
—	<code>\lilyGlyph{rests.0o}</code> *	⋈	<code>\lilyGlyph{rests.6}</code>
—	<code>\lilyGlyph{rests.1}</code>	⋈	<code>\lilyGlyph{rests.7}</code>
·	<code>\lilyGlyph{rests.1mensural}</code>	■	<code>\lilyGlyph{rests.M1}</code>
·	<code>\lilyGlyph{rests.1neomensural}</code>	·	<code>\lilyGlyph{rests.M1mensural}</code>
—	<code>\lilyGlyph{rests.1o}</code> *	·	<code>\lilyGlyph{rests.M1neomensural}</code>
⋈	<code>\lilyGlyph{rests.2}</code> *	■	<code>\lilyGlyph{rests.M1o}</code>
⋈	<code>\lilyGlyph{rests.2classical}</code>	■	<code>\lilyGlyph{rests.M2}</code>
⋈	<code>\lilyGlyph{rests.2mensural}</code>		<code>\lilyGlyph{rests.M2mensural}</code>
⋈	<code>\lilyGlyph{rests.2neomensural}</code>		<code>\lilyGlyph{rests.M2neomensural}</code>
⋈	<code>\lilyGlyph{rests.3}</code> *		<code>\lilyGlyph{rests.M3}</code>
·	<code>\lilyGlyph{rests.3mensural}</code>		<code>\lilyGlyph{rests.M3mensural}</code>
·	<code>\lilyGlyph{rests.3neomensural}</code>		<code>\lilyGlyph{rests.M3neomensural}</code>
⋈	<code>\lilyGlyph{rests.4}</code> *		

\* *lilyglyphs* defines shorter names for these symbols. See Table 493.

TABLE 502: *lilyglyphs* Named Pedals

*	<code>\lilyGlyph{pedal.*}</code>	-	<code>\lilyGlyph{pedal.M}</code>
·	<code>\lilyGlyph{pedal..}</code>	⊗	<code>\lilyGlyph{pedal.P}</code>
δ	<code>\lilyGlyph{pedal.d}</code>	⊗	<code>\lilyGlyph{pedal.Ped}</code>
ε	<code>\lilyGlyph{pedal.e}</code>		



TABLE 503: *lilyglyphs* Named Flags





































	<code>\lilyGlyph{flags.d3}</code>		<code>\lilyGlyph{flags.mensuralu03}</code>
	<code>\lilyGlyph{flags.d4}</code>		<code>\lilyGlyph{flags.mensuralu04}</code>
	<code>\lilyGlyph{flags.d5}</code>		<code>\lilyGlyph{flags.mensuralu05}</code>
	<code>\lilyGlyph{flags.d6}</code>		<code>\lilyGlyph{flags.mensuralu06}</code>
	<code>\lilyGlyph{flags.d7}</code>		<code>\lilyGlyph{flags.mensuralu13}</code>
	<code>\lilyGlyph{flags.dgrace}</code>		<code>\lilyGlyph{flags.mensuralu14}</code>
	<code>\lilyGlyph{flags.mensurald03}</code>		<code>\lilyGlyph{flags.mensuralu15}</code>
	<code>\lilyGlyph{flags.mensurald04}</code>		<code>\lilyGlyph{flags.mensuralu16}</code>
	<code>\lilyGlyph{flags.mensurald05}</code>		<code>\lilyGlyph{flags.mensuralu23}</code>
	<code>\lilyGlyph{flags.mensurald06}</code>		<code>\lilyGlyph{flags.mensuralu24}</code>
	<code>\lilyGlyph{flags.mensurald13}</code>		<code>\lilyGlyph{flags.mensuralu25}</code>
	<code>\lilyGlyph{flags.mensurald14}</code>		<code>\lilyGlyph{flags.mensuralu26}</code>
	<code>\lilyGlyph{flags.mensurald15}</code>		<code>\lilyGlyph{flags.u3}</code>
	<code>\lilyGlyph{flags.mensurald16}</code>		<code>\lilyGlyph{flags.u4}</code>
	<code>\lilyGlyph{flags.mensurald23}</code>		<code>\lilyGlyph{flags.u5}</code>
	<code>\lilyGlyph{flags.mensurald24}</code>		<code>\lilyGlyph{flags.u6}</code>
	<code>\lilyGlyph{flags.mensurald25}</code>		<code>\lilyGlyph{flags.u7}</code>
	<code>\lilyGlyph{flags.mensurald26}</code>		<code>\lilyGlyph{flags.ugrace}</code>

TABLE 504: *lilyglyphs* Named Custodes











































































	<code>\lilyGlyph{custodes.hufnagel.d0}</code>		<code>\lilyGlyph{custodes.mensural.d0}</code>
	<code>\lilyGlyph{custodes.hufnagel.d1}</code>		<code>\lilyGlyph{custodes.mensural.d1}</code>
	<code>\lilyGlyph{custodes.hufnagel.d2}</code>		<code>\lilyGlyph{custodes.mensural.d2}</code>
	<code>\lilyGlyph{custodes.hufnagel.u0}</code>		<code>\lilyGlyph{custodes.mensural.u0}</code>
	<code>\lilyGlyph{custodes.hufnagel.u1}</code>		<code>\lilyGlyph{custodes.mensural.u1}</code>
	<code>\lilyGlyph{custodes.hufnagel.u2}</code>		<code>\lilyGlyph{custodes.mensural.u2}</code>
	<code>\lilyGlyph{custodes.medicaea.d0}</code>		<code>\lilyGlyph{custodes.vaticana.d0}</code>
	<code>\lilyGlyph{custodes.medicaea.d1}</code>		<code>\lilyGlyph{custodes.vaticana.d1}</code>
	<code>\lilyGlyph{custodes.medicaea.d2}</code>		<code>\lilyGlyph{custodes.vaticana.d2}</code>
	<code>\lilyGlyph{custodes.medicaea.u0}</code>		<code>\lilyGlyph{custodes.vaticana.u0}</code>
	<code>\lilyGlyph{custodes.medicaea.u1}</code>		<code>\lilyGlyph{custodes.vaticana.u1}</code>
	<code>\lilyGlyph{custodes.medicaea.u2}</code>		<code>\lilyGlyph{custodes.vaticana.u2}</code>

TABLE 505: *lilyglyphs* Named Clefs

	<code>\lilyGlyph{clefs.blackmensural.c}</code>		<code>\lilyGlyph{clefs.mensural.g_change}</code>
	<code>\lilyGlyph{clefs.blackmensural.c_change}</code>		<code>\lilyGlyph{clefs.neomensural.c}</code>
	<code>\lilyGlyph{clefs.C}*</code>		<code>\lilyGlyph{clefs.neomensural.c_change}</code>
	<code>\lilyGlyph{clefs.C_change}*</code>		<code>\lilyGlyph{clefs.percussion}</code>
	<code>\lilyGlyph{clefs.F}*</code>		<code>\lilyGlyph{clefs.percussion_change}</code>
	<code>\lilyGlyph{clefs.F_change}*</code>		<code>\lilyGlyph{clefs.petrucci.c1}</code>
	<code>\lilyGlyph{clefs.G}*</code>		<code>\lilyGlyph{clefs.petrucci.c1_change}</code>
	<code>\lilyGlyph{clefs.G_change}*</code>		<code>\lilyGlyph{clefs.petrucci.c2}</code>
	<code>\lilyGlyph{clefs.hufnagel.do}</code>		<code>\lilyGlyph{clefs.petrucci.c2_change}</code>
	<code>\lilyGlyph{clefs.hufnagel.do.fa}</code>		<code>\lilyGlyph{clefs.petrucci.c3}</code>
	<code>\lilyGlyph{clefs.hufnagel.do.fa_change}</code>		<code>\lilyGlyph{clefs.petrucci.c3_change}</code>
	<code>\lilyGlyph{clefs.hufnagel.do_change}</code>		<code>\lilyGlyph{clefs.petrucci.c4}</code>
	<code>\lilyGlyph{clefs.hufnagel.fa}</code>		<code>\lilyGlyph{clefs.petrucci.c4_change}</code>
	<code>\lilyGlyph{clefs.hufnagel.fa_change}</code>		<code>\lilyGlyph{clefs.petrucci.c5}</code>
	<code>\lilyGlyph{clefs.kievan.do}</code>		<code>\lilyGlyph{clefs.petrucci.c5_change}</code>
	<code>\lilyGlyph{clefs.kievan.do_change}</code>		<code>\lilyGlyph{clefs.petrucci.f}</code>
	<code>\lilyGlyph{clefs.medicaea.do}</code>		<code>\lilyGlyph{clefs.petrucci.f_change}</code>
	<code>\lilyGlyph{clefs.medicaea.do_change}</code>		<code>\lilyGlyph{clefs.petrucci.g}</code>
	<code>\lilyGlyph{clefs.medicaea.fa}</code>		<code>\lilyGlyph{clefs.petrucci.g_change}</code>
	<code>\lilyGlyph{clefs.medicaea.fa_change}</code>		<code>\lilyGlyph{clefs.tab}</code>
	<code>\lilyGlyph{clefs.mensural.c}</code>		<code>\lilyGlyph{clefs.tab_change}</code>
	<code>\lilyGlyph{clefs.mensural.c_change}</code>		<code>\lilyGlyph{clefs.vaticana.do}</code>
	<code>\lilyGlyph{clefs.mensural.f}</code>		<code>\lilyGlyph{clefs.vaticana.do_change}</code>
	<code>\lilyGlyph{clefs.mensural.f_change}</code>		<code>\lilyGlyph{clefs.vaticana.fa}</code>
	<code>\lilyGlyph{clefs.mensural.g}</code>		<code>\lilyGlyph{clefs.vaticana.fa_change}</code>












































\* *lilyglyphs* defines shorter names for these symbols. See Table 490.

TABLE 506: *lilyglyphs* Named Noteheads

◩	<code>\lilyGlyph{noteheads.d0doFunk}</code>
◪	<code>\lilyGlyph{noteheads.d0fa}</code>
◤	<code>\lilyGlyph{noteheads.d0faFunk}</code>
◥	<code>\lilyGlyph{noteheads.d0faThin}</code>
◊	<code>\lilyGlyph{noteheads.d0miFunk}</code>
◄	<code>\lilyGlyph{noteheads.d0reFunk}</code>
◅	<code>\lilyGlyph{noteheads.d0tiFunk}</code>
▲	<code>\lilyGlyph{noteheads.d1do}</code>
◩	<code>\lilyGlyph{noteheads.d1doFunk}</code>
◪	<code>\lilyGlyph{noteheads.d1doThin}</code>
◤	<code>\lilyGlyph{noteheads.d1doWalker}</code>
◥	<code>\lilyGlyph{noteheads.d1fa}</code>
◤	<code>\lilyGlyph{noteheads.d1faFunk}</code>
◥	<code>\lilyGlyph{noteheads.d1faThin}</code>
◤	<code>\lilyGlyph{noteheads.d1faWalker}</code>
◊	<code>\lilyGlyph{noteheads.d1miFunk}</code>
◩	<code>\lilyGlyph{noteheads.d1re}</code>
◄	<code>\lilyGlyph{noteheads.d1reFunk}</code>
◩	<code>\lilyGlyph{noteheads.d1reThin}</code>
◩	<code>\lilyGlyph{noteheads.d1reWalker}</code>
◊	<code>\lilyGlyph{noteheads.d1ti}</code>
◅	<code>\lilyGlyph{noteheads.d1tiFunk}</code>
◊	<code>\lilyGlyph{noteheads.d1tiThin}</code>
◄	<code>\lilyGlyph{noteheads.d1tiWalker}</code>
➤	<code>\lilyGlyph{noteheads.d1triangle}</code>
▲	<code>\lilyGlyph{noteheads.d2do}</code>
◩	<code>\lilyGlyph{noteheads.d2doFunk}</code>
▲	<code>\lilyGlyph{noteheads.d2doThin}</code>
▲	<code>\lilyGlyph{noteheads.d2doWalker}</code>
◤	<code>\lilyGlyph{noteheads.d2fa}</code>
◤	<code>\lilyGlyph{noteheads.d2faFunk}</code>
◤	<code>\lilyGlyph{noteheads.d2faThin}</code>
◤	<code>\lilyGlyph{noteheads.d2faWalker}</code>
⌈	<code>\lilyGlyph{noteheads.d2kievan}</code>
◩	<code>\lilyGlyph{noteheads.d2re}</code>
◄	<code>\lilyGlyph{noteheads.d2reFunk}</code>
◩	<code>\lilyGlyph{noteheads.d2reThin}</code>
◩	<code>\lilyGlyph{noteheads.d2reWalker}</code>
◊	<code>\lilyGlyph{noteheads.d2ti}</code>
◄	<code>\lilyGlyph{noteheads.d2tiFunk}</code>
◊	<code>\lilyGlyph{noteheads.d2tiThin}</code>
◄	<code>\lilyGlyph{noteheads.d2tiWalker}</code>
➤	<code>\lilyGlyph{noteheads.d2triangle}</code>

*(continued on next page)*

*(continued from previous page)*

	<code>\lilyGlyph{noteheads.d3kievan}</code>
	<code>\lilyGlyph{noteheads.dM2}</code>
	<code>\lilyGlyph{noteheads.dM2blackmensural}</code>
	<code>\lilyGlyph{noteheads.dM2mensural}</code>
	<code>\lilyGlyph{noteheads.dM2neomensural}</code>
	<code>\lilyGlyph{noteheads.dM2semimensural}</code>
	<code>\lilyGlyph{noteheads.dM3blackmensural}</code>
	<code>\lilyGlyph{noteheads.dM3mensural}</code>
	<code>\lilyGlyph{noteheads.dM3neomensural}</code>
	<code>\lilyGlyph{noteheads.dM3semimensural}</code>
	<code>\lilyGlyph{noteheads.drM2mensural}</code>
	<code>\lilyGlyph{noteheads.drM2neomensural}</code>
	<code>\lilyGlyph{noteheads.drM2semimensural}</code>
	<code>\lilyGlyph{noteheads.drM3mensural}</code>
	<code>\lilyGlyph{noteheads.drM3neomensural}</code>
	<code>\lilyGlyph{noteheads.drM3semimensural}</code>
	<code>\lilyGlyph{noteheads.s0}</code>
	<code>\lilyGlyph{noteheads.s0blackmensural}</code>
	<code>\lilyGlyph{noteheads.s0blackpetrucci}</code>
	<code>\lilyGlyph{noteheads.s0cross}</code>
	<code>\lilyGlyph{noteheads.s0diamond}</code>
	<code>\lilyGlyph{noteheads.s0do}</code>
	<code>\lilyGlyph{noteheads.s0doThin}</code>
	<code>\lilyGlyph{noteheads.s0doWalker}</code>
	<code>\lilyGlyph{noteheads.s0faWalker}</code>
	<code>\lilyGlyph{noteheads.s0harmonic}</code>
	<code>\lilyGlyph{noteheads.s0kievan}</code>
	<code>\lilyGlyph{noteheads.s0la}</code>
	<code>\lilyGlyph{noteheads.s0laFunk}</code>
	<code>\lilyGlyph{noteheads.s0laThin}</code>
	<code>\lilyGlyph{noteheads.s0laWalker}</code>
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	<code>\lilyGlyph{noteheads.s0mi}</code>
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	<code>\lilyGlyph{noteheads.s0miThin}</code>
	<code>\lilyGlyph{noteheads.s0miWalker}</code>
	<code>\lilyGlyph{noteheads.s0neomensural}</code>
	<code>\lilyGlyph{noteheads.s0petrucci}</code>
	<code>\lilyGlyph{noteheads.s0re}</code>
	<code>\lilyGlyph{noteheads.s0reThin}</code>
	<code>\lilyGlyph{noteheads.s0reWalker}</code>
	<code>\lilyGlyph{noteheads.s0slash}</code>
	<code>\lilyGlyph{noteheads.s0sol}</code>

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◦ \lilyGlyph{noteheads.s0solFunk}
◊ \lilyGlyph{noteheads.s0ti}
◊ \lilyGlyph{noteheads.s0tiThin}
◄ \lilyGlyph{noteheads.s0tiWalker}
▷ \lilyGlyph{noteheads.s0triangle}
◦ \lilyGlyph{noteheads.s1}
◆ \lilyGlyph{noteheads.s1blackpetrucci}
⊗ \lilyGlyph{noteheads.s1cross}
◊ \lilyGlyph{noteheads.s1diamond}
† \lilyGlyph{noteheads.s1kievan}
■ \lilyGlyph{noteheads.s1la}
◻ \lilyGlyph{noteheads.s1laFunk}
◻ \lilyGlyph{noteheads.s1laThin}
◻ \lilyGlyph{noteheads.s1laWalker}
◊ \lilyGlyph{noteheads.s1mensural}
◊ \lilyGlyph{noteheads.s1mi}
◊ \lilyGlyph{noteheads.s1miMirror}
◊ \lilyGlyph{noteheads.s1miThin}
◊ \lilyGlyph{noteheads.s1miWalker}
◊ \lilyGlyph{noteheads.s1neomensural}
◆ \lilyGlyph{noteheads.s1petrucci}
// \lilyGlyph{noteheads.s1slash}
◦ \lilyGlyph{noteheads.s1sol}
◦ \lilyGlyph{noteheads.s1solFunk}
● \lilyGlyph{noteheads.s2}
◆ \lilyGlyph{noteheads.s2blackpetrucci}
× \lilyGlyph{noteheads.s2cross}
// \lilyGlyph{noteheads.s2diamond}
◆ \lilyGlyph{noteheads.s2harmonic}
■ \lilyGlyph{noteheads.s2la}
■ \lilyGlyph{noteheads.s2laFunk}
■ \lilyGlyph{noteheads.s2laThin}
■ \lilyGlyph{noteheads.s2laWalker}
◊ \lilyGlyph{noteheads.s2mensural}
◊ \lilyGlyph{noteheads.s2mi}
◊ \lilyGlyph{noteheads.s2miFunk}
◊ \lilyGlyph{noteheads.s2miMirror}
◊ \lilyGlyph{noteheads.s2miThin}
◊ \lilyGlyph{noteheads.s2miWalker}
◊ \lilyGlyph{noteheads.s2neomensural}
◆ \lilyGlyph{noteheads.s2petrucci}
/ \lilyGlyph{noteheads.s2slash}
● \lilyGlyph{noteheads.s2sol}
● \lilyGlyph{noteheads.s2solFunk}
⊗ \lilyGlyph{noteheads.s2xcircle}
■ \lilyGlyph{noteheads.shufnagel.lpes}

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♦      \lilyGlyph{noteheads.shufnagel.punctum}
†      \lilyGlyph{noteheads.shufnagel.virga}
♩      \lilyGlyph{noteheads.sM1}
♩      \lilyGlyph{noteheads.sM1blackmensural}
♩      \lilyGlyph{noteheads.sM1double}
♩      \lilyGlyph{noteheads.sM1kievan}
♩      \lilyGlyph{noteheads.sM1mensural}
♩      \lilyGlyph{noteheads.sM1neomensural}
♩      \lilyGlyph{noteheads.sM1semimensural}
♩      \lilyGlyph{noteheads.sM2blackligmensural}
♩      \lilyGlyph{noteheads.sM2kievan}
♩      \lilyGlyph{noteheads.sM2ligmensural}
♩      \lilyGlyph{noteheads.sM2semiligmensural}
♩      \lilyGlyph{noteheads.sM3blackligmensural}
♩      \lilyGlyph{noteheads.sM3ligmensural}
♩      \lilyGlyph{noteheads.sM3semiligmensural}
♦      \lilyGlyph{noteheads.smedicaea.inclinatum}
▪      \lilyGlyph{noteheads.smedicaea.punctum}
┌      \lilyGlyph{noteheads.smedicaea.rvirga}
└      \lilyGlyph{noteheads.smedicaea.virga}
└      \lilyGlyph{noteheads.sr1kievan}
♩      \lilyGlyph{noteheads.srM1mensural}
♩      \lilyGlyph{noteheads.srM1neomensural}
♩      \lilyGlyph{noteheads.srM1semimensural}
♩      \lilyGlyph{noteheads.srM2ligmensural}
♩      \lilyGlyph{noteheads.srM2semiligmensural}
♩      \lilyGlyph{noteheads.srM3ligmensural}
♩      \lilyGlyph{noteheads.srM3semiligmensural}
,      \lilyGlyph{noteheads.ssolesmes.auct.asc}
,      \lilyGlyph{noteheads.ssolesmes.auct.desc}
,      \lilyGlyph{noteheads.ssolesmes.incl.auctum}
.      \lilyGlyph{noteheads.ssolesmes.incl.parvum}
.      \lilyGlyph{noteheads.ssolesmes.oriscus}
,      \lilyGlyph{noteheads.ssolesmes.stropha}
,      \lilyGlyph{noteheads.ssolesmes.stropha.aucta}
^      \lilyGlyph{noteheads.svaticana.cephalicus}
^      \lilyGlyph{noteheads.svaticana.epiphonus}
♦      \lilyGlyph{noteheads.svaticana.inclinatum}
▪      \lilyGlyph{noteheads.svaticana.inner.cephalicus}
▪      \lilyGlyph{noteheads.svaticana.linea.punctum}
◻      \lilyGlyph{noteheads.svaticana.linea.punctum.cavum}
▪      \lilyGlyph{noteheads.svaticana.lpes}
.      \lilyGlyph{noteheads.svaticana.plica}
▪      \lilyGlyph{noteheads.svaticana.punctum}
◻      \lilyGlyph{noteheads.svaticana.punctum.cavum}

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• \lilyGlyph{noteheads.svaticana.quilisma}
. \lilyGlyph{noteheads.svaticana.reverse.plica}
. \lilyGlyph{noteheads.svaticana.reverse.vplica}
▪ \lilyGlyph{noteheads.svaticana.upes}
▪ \lilyGlyph{noteheads.svaticana.vepiphonus}
▪ \lilyGlyph{noteheads.svaticana.vlpes}
. \lilyGlyph{noteheads.svaticana.vplica}
▪ \lilyGlyph{noteheads.svaticana.vupes}
◊ \lilyGlyph{noteheads.u0doFunk}
♯ \lilyGlyph{noteheads.u0fa}
♯ \lilyGlyph{noteheads.u0faFunk}
♯ \lilyGlyph{noteheads.u0faThin}
◊ \lilyGlyph{noteheads.u0miFunk}
♭ \lilyGlyph{noteheads.u0reFunk}
◊ \lilyGlyph{noteheads.u0tiFunk}
♯ \lilyGlyph{noteheads.u1do}
◊ \lilyGlyph{noteheads.u1doFunk}
♯ \lilyGlyph{noteheads.u1doThin}
♭ \lilyGlyph{noteheads.u1doWalker}
♯ \lilyGlyph{noteheads.u1fa}
♯ \lilyGlyph{noteheads.u1faFunk}
♯ \lilyGlyph{noteheads.u1faThin}
♯ \lilyGlyph{noteheads.u1faWalker}
◊ \lilyGlyph{noteheads.u1miFunk}
♭ \lilyGlyph{noteheads.u1re}
♭ \lilyGlyph{noteheads.u1reFunk}
♭ \lilyGlyph{noteheads.u1reThin}
♭ \lilyGlyph{noteheads.u1reWalker}
◊ \lilyGlyph{noteheads.u1ti}
◊ \lilyGlyph{noteheads.u1tiFunk}
◊ \lilyGlyph{noteheads.u1tiThin}
♭ \lilyGlyph{noteheads.u1tiWalker}
♭ \lilyGlyph{noteheads.u1triangle}
♯ \lilyGlyph{noteheads.u2do}
♭ \lilyGlyph{noteheads.u2doFunk}
♯ \lilyGlyph{noteheads.u2doThin}
♭ \lilyGlyph{noteheads.u2doWalker}
♭ \lilyGlyph{noteheads.u2fa}
♭ \lilyGlyph{noteheads.u2faFunk}
♭ \lilyGlyph{noteheads.u2faThin}
♭ \lilyGlyph{noteheads.u2faWalker}
♭ \lilyGlyph{noteheads.u2kievan}
♭ \lilyGlyph{noteheads.u2re}
♭ \lilyGlyph{noteheads.u2reFunk}
♭ \lilyGlyph{noteheads.u2reThin}
♭ \lilyGlyph{noteheads.u2reWalker}

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♢	<code>\lilyGlyph{noteheads.u2ti}</code>
♣	<code>\lilyGlyph{noteheads.u2tiFunk}</code>
♤	<code>\lilyGlyph{noteheads.u2tiThin}</code>
♥	<code>\lilyGlyph{noteheads.u2tiWalker}</code>
♦	<code>\lilyGlyph{noteheads.u2triangle}</code>
♧	<code>\lilyGlyph{noteheads.u3kievan}</code>
♨	<code>\lilyGlyph{noteheads.uM2}</code>
♩	<code>\lilyGlyph{noteheads.uM2blackmensural}</code>
♪	<code>\lilyGlyph{noteheads.uM2mensural}</code>
♫	<code>\lilyGlyph{noteheads.uM2neomensural}</code>
♬	<code>\lilyGlyph{noteheads.uM2semimensural}</code>
♭	<code>\lilyGlyph{noteheads.uM3blackmensural}</code>
♮	<code>\lilyGlyph{noteheads.uM3mensural}</code>
♯	<code>\lilyGlyph{noteheads.uM3neomensural}</code>
♰	<code>\lilyGlyph{noteheads.uM3semimensural}</code>
♱	<code>\lilyGlyph{noteheads.urM2mensural}</code>
♲	<code>\lilyGlyph{noteheads.urM2neomensural}</code>
♳	<code>\lilyGlyph{noteheads.urM2semimensural}</code>
♴	<code>\lilyGlyph{noteheads.urM3mensural}</code>
♵	<code>\lilyGlyph{noteheads.urM3neomensural}</code>
♶	<code>\lilyGlyph{noteheads.urM3semimensural}</code>

TABLE 507: *lilyglyphs* Named Accordion Symbols

☰	<code>\lilyGlyph{accordion.bayanbass}</code>	⊗	<code>\lilyGlyph{accordion.oldEE}</code>
⊖	<code>\lilyGlyph{accordion.discant}</code>	⌋	<code>\lilyGlyph{accordion.pull}</code>
.	<code>\lilyGlyph{accordion.dot}</code>	>	<code>\lilyGlyph{accordion.push}</code>
⊖	<code>\lilyGlyph{accordion.freebass}</code>	⊖	<code>\lilyGlyph{accordion.stdbass}</code>

*lilyglyphs* defines shorter names for all of these symbols except `\lilyGlyph{accordion.dot}`. See Table 498.



TABLE 508: *lilyglyphs* Named Accidentals

×	<code>\lilyGlyph{accidentals.doublsharp}*</code>
♭	<code>\lilyGlyph{accidentals.flat}*</code>
↕	<code>\lilyGlyph{accidentals.flat.arrowboth}</code>
↓	<code>\lilyGlyph{accidentals.flat.arrowdown}</code>
↑	<code>\lilyGlyph{accidentals.flat.arrowup}</code>
♮	<code>\lilyGlyph{accidentals.flat.slash}</code>
♮	<code>\lilyGlyph{accidentals.flat.slashslash}</code>
♮	<code>\lilyGlyph{accidentals.flatflat}*</code>
♮	<code>\lilyGlyph{accidentals.flatflat.slash}</code>
♮	<code>\lilyGlyph{accidentals.hufnagelM1}</code>
✖	<code>\lilyGlyph{accidentals.kievan1}</code>
⓪	<code>\lilyGlyph{accidentals.kievanM1}</code>
(	<code>\lilyGlyph{accidentals.leftparen}</code>
♮	<code>\lilyGlyph{accidentals.medicaeaM1}</code>
×	<code>\lilyGlyph{accidentals.mensural1}</code>
♮	<code>\lilyGlyph{accidentals.mensuralM1}</code>
♮	<code>\lilyGlyph{accidentals.mirroredflat}</code>
♮	<code>\lilyGlyph{accidentals.mirroredflat.backslash}</code>
♮	<code>\lilyGlyph{accidentals.mirroredflat.flat}</code>
♮	<code>\lilyGlyph{accidentals.natural}*</code>
↕	<code>\lilyGlyph{accidentals.natural.arrowboth}</code>
↓	<code>\lilyGlyph{accidentals.natural.arrowdown}</code>
↑	<code>\lilyGlyph{accidentals.natural.arrowup}</code>
)	<code>\lilyGlyph{accidentals.rightparen}</code>
♯	<code>\lilyGlyph{accidentals.sharp}*</code>
↕	<code>\lilyGlyph{accidentals.sharp.arrowboth}*</code>
↓	<code>\lilyGlyph{accidentals.sharp.arrowdown}*</code>
↑	<code>\lilyGlyph{accidentals.sharp.arrowup}*</code>
♯	<code>\lilyGlyph{accidentals.sharp.slashslash.stem}*</code>
♯	<code>\lilyGlyph{accidentals.sharp.slashslash.stemstem}*</code>
♯	<code>\lilyGlyph{accidentals.sharp.slashslashslash.stem}*</code>
♯	<code>\lilyGlyph{accidentals.sharp.slashslashslash.stemstem}*</code>
♯	<code>\lilyGlyph{accidentals.vaticana0}</code>
♯	<code>\lilyGlyph{accidentals.vaticanaM1}</code>

\* *lilyglyphs* defines shorter names for these symbols. See Table 492.

TABLE 509: *lilyglyphs* Named Arrowheads

▶	<code>\lilyGlyph{arrowheads.close.01}</code>	>	<code>\lilyGlyph{arrowheads.open.01}</code>
◄	<code>\lilyGlyph{arrowheads.close.0M1}</code>	<	<code>\lilyGlyph{arrowheads.open.0M1}</code>
▲	<code>\lilyGlyph{arrowheads.close.11}</code>	⤴	<code>\lilyGlyph{arrowheads.open.11}</code>
▼	<code>\lilyGlyph{arrowheads.close.1M1}</code>	⤵	<code>\lilyGlyph{arrowheads.open.1M1}</code>

TABLE 510: *lilyglyphs* Named Alphanumerics and Punctuation

<b>0</b>	<code>\lilyGlyph{zero}</code>	<b>4</b>	<code>\lilyGlyph{four}</code>	<b>8</b>	<code>\lilyGlyph{eight}</code>
<b>1</b>	<code>\lilyGlyph{one}</code>	<b>5</b>	<code>\lilyGlyph{five}</code>	<b>9</b>	<code>\lilyGlyph{nine}</code>
<b>2</b>	<code>\lilyGlyph{two}</code>	<b>6</b>	<code>\lilyGlyph{six}</code>		
<b>3</b>	<code>\lilyGlyph{three}</code>	<b>7</b>	<code>\lilyGlyph{seven}</code>		
<b><i>f</i></b>	<code>\lilyGlyph{f}</code>	<b><i>p</i></b>	<code>\lilyGlyph{p}</code>	<b><i>s</i></b>	<code>\lilyGlyph{s}</code>
<b><i>m</i></b>	<code>\lilyGlyph{m}</code>	<b><i>r</i></b>	<code>\lilyGlyph{r}</code>	<b><i>z</i></b>	<code>\lilyGlyph{z}</code>
<b>,</b>	<code>\lilyGlyph{comma}</code>	<b>.</b>	<code>\lilyGlyph{period}</code>		
<b>-</b>	<code>\lilyGlyph{hyphen}</code>	<b>+</b>	<code>\lilyGlyph{plus}</code>		

See Table 494 for an alternative way to typeset dynamics letters. *lilyglyphs* additionally provides a `\lilyText` command that can be useful for typesetting groups of the preceding symbols. See the *lilyglyphs* documentation for more information.

TABLE 511: Miscellaneous *lilyglyphs* Named Musical Symbols

∩	<code>\lilyGlyph{brackettips.down}</code>	.	<code>\lilyGlyph{dots.dotvaticana}</code>
∪	<code>\lilyGlyph{brackettips.up}</code>	⌋	<code>\lilyGlyph{ties.lyric.default}</code>
.	<code>\lilyGlyph{dots.dot}</code>	⌋	<code>\lilyGlyph{ties.lyric.short}</code>
•	<code>\lilyGlyph{dots.dotkievan}</code>		

## Chapter 8

# Gaming symbols

This chapter presents symbols related to games and gaming: playing-card suits, dice, and symbols used to represent pieces and moves in various games. Additional gaming symbols appear in Chapter 11, but those symbols are delivered by packages that provide minimal L<sup>A</sup>T<sub>E</sub>X support.

TABLE 512: L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Playing-Card Suits

♣ `\clubsuit`    ♦ `\diamondsuit`    ♥ `\heartsuit`    ♠ `\spadesuit`

TABLE 513: txfonts/pxfonts Playing-Card Suits

♣ `\varclubsuit`    ♦ `\vardiamondsuit`    ♥ `\varheartsuit`    ♠ `\varspadesuit`

TABLE 514: MnSymbol Playing-Card Suits

♣ `\clubsuit`    ♦ `\diamondsuit`    ♥ `\heartsuit`    ♠ `\spadesuit`

TABLE 515: fdsymbol Playing-Card Suits

♣ `\clubsuit`    ♥ `\heartsuit`    ♦ `\vardiamondsuit`  
♦ `\diamondsuit`    ♠ `\spadesuit`    ♥ `\varheartsuit`

TABLE 516: boisik Playing-Card Suits

♣ `\clubsuit`    ♦ `\diamondsuit`    ♥ `\heartsuit`    ♠ `\spadesuit`

TABLE 517: stix Playing-Card Suits

♣	<code>\clubsuit</code>	♥	<code>\heartsuit</code>	♠	<code>\varclubsuit</code>	♥	<code>\varheartsuit</code>
◇	<code>\diamondsuit</code>	♠	<code>\spadesuit</code>	◆	<code>\vardiamondsuit</code>	♠	<code>\varspadesuit</code>

TABLE 518: arev Playing-Card Suits

♠	<code>\varclub</code>	◆	<code>\vardiamond</code>	♥	<code>\varheart</code>	♠	<code>\varspade</code>
---	-----------------------	---	--------------------------	---	------------------------	---	------------------------

TABLE 519: twemojis Playing-Card Suits

♣	<code>\twemoji{club suit}</code>	♥	<code>\twemoji{heart suit}</code>
◆	<code>\twemoji{diamond suit}</code>	♠	<code>\twemoji{spade suit}</code>

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.



















































































All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

TABLE 520: utfsym Playing-Card Suits

♠	<code>\usym{2660}</code>	◇	<code>\usym{2662}</code>	♠	<code>\usym{2664}</code>	◆	<code>\usym{2666}</code>
♥	<code>\usym{2661}</code>	♣	<code>\usym{2663}</code>	♥	<code>\usym{2665}</code>	♠	<code>\usym{2667}</code>

All utfsym symbols are implemented with TikZ graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the utfsym documentation for more information.

TABLE 521: utfsym Playing Cards

	<code>\usym{1FOA0}</code>		<code>\usym{1FOB7}</code>		<code>\usym{1FOCD}</code>		<code>\usym{1FOE3}</code>
	<code>\usym{1FOA1}</code>		<code>\usym{1FOB8}</code>		<code>\usym{1FOCE}</code>		<code>\usym{1FOE4}</code>
	<code>\usym{1FOA2}</code>		<code>\usym{1FOB9}</code>		<code>\usym{1FOCF}</code>		<code>\usym{1FOE5}</code>
	<code>\usym{1FOA3}</code>		<code>\usym{1FOBA}</code>		<code>\usym{1FOD1}</code>		<code>\usym{1FOE6}</code>
	<code>\usym{1FOA4}</code>		<code>\usym{1FOBB}</code>		<code>\usym{1FOD2}</code>		<code>\usym{1FOE7}</code>
	<code>\usym{1FOA5}</code>		<code>\usym{1FOBC}</code>		<code>\usym{1FOD3}</code>		<code>\usym{1FOE8}</code>
	<code>\usym{1FOA6}</code>		<code>\usym{1FOBD}</code>		<code>\usym{1FOD4}</code>		<code>\usym{1FOE9}</code>
	<code>\usym{1FOA7}</code>		<code>\usym{1FOBE}</code>		<code>\usym{1FOD5}</code>		<code>\usym{1FOEA}</code>
	<code>\usym{1FOA8}</code>		<code>\usym{1FOBF}</code>		<code>\usym{1FOD6}</code>		<code>\usym{1FOEB}</code>
	<code>\usym{1FOA9}</code>		<code>\usym{1FOC1}</code>		<code>\usym{1FOD7}</code>		<code>\usym{1FOEC}</code>
	<code>\usym{1FOAA}</code>		<code>\usym{1FOC2}</code>		<code>\usym{1FOD8}</code>		<code>\usym{1FOED}</code>
	<code>\usym{1FOAB}</code>		<code>\usym{1FOC3}</code>		<code>\usym{1FOD9}</code>		<code>\usym{1FOEE}</code>
	<code>\usym{1FOAC}</code>		<code>\usym{1FOC4}</code>		<code>\usym{1FODA}</code>		<code>\usym{1FOEF}</code>
	<code>\usym{1FOAD}</code>		<code>\usym{1FOC5}</code>		<code>\usym{1FODB}</code>		<code>\usym{1FOF0}</code>
	<code>\usym{1FOAE}</code>		<code>\usym{1FOC6}</code>		<code>\usym{1FODC}</code>		<code>\usym{1FOF1}</code>
	<code>\usym{1FOB1}</code>		<code>\usym{1FOC7}</code>		<code>\usym{1FODD}</code>		<code>\usym{1FOF2}</code>
	<code>\usym{1FOB2}</code>		<code>\usym{1FOC8}</code>		<code>\usym{1FODE}</code>		<code>\usym{1FOF3}</code>
	<code>\usym{1FOB3}</code>		<code>\usym{1FOC9}</code>		<code>\usym{1FODF}</code>		<code>\usym{1FOF4}</code>
	<code>\usym{1FOB4}</code>		<code>\usym{1FOCA}</code>		<code>\usym{1FOE0}</code>		<code>\usym{1FOF5}</code>
	<code>\usym{1FOB5}</code>		<code>\usym{1FOCB}</code>		<code>\usym{1FOE1}</code>		
	<code>\usym{1FOB6}</code>		<code>\usym{1FOCC}</code>		<code>\usym{1FOE2}</code>		

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, “`\usymH{1FOBE}{36pt}`” produces



See the `utfsym` documentation for more information.

TABLE 522: epsdice Dice













	<code>\epsdice{1}</code>		<code>\epsdice{3}</code>		<code>\epsdice{5}</code>
	<code>\epsdice{2}</code>		<code>\epsdice{4}</code>		<code>\epsdice{6}</code>

TABLE 523: hhcount Dice

	<code>\fcdice{1}</code>		<code>\fcdice{3}</code>		<code>\fcdice{5}</code>
	<code>\fcdice{2}</code>		<code>\fcdice{4}</code>		<code>\fcdice{6}</code>

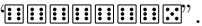
The `\fcdice` command accepts values larger than 6. For example, “`\fcdice{47}`” produces “”.

TABLE 524: stix Dice







	<code>\dicei</code>		<code>\diceiii</code>		<code>\dicev</code>
	<code>\diceii</code>		<code>\diceiv</code>		<code>\dicevi</code>

TABLE 525: ifsym Dice













	<code>\Cube{1}</code>		<code>\Cube{3}</code>		<code>\Cube{5}</code>
	<code>\Cube{2}</code>		<code>\Cube{4}</code>		<code>\Cube{6}</code>

TABLE 526: utfsym Dice

	<code>\usym{2680}</code>		<code>\usym{2682}</code>		<code>\usym{2684}</code>
	<code>\usym{2681}</code>		<code>\usym{2683}</code>		<code>\usym{2685}</code>

All `utfsym` symbols are implemented with *TikZ* graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 527: fontawesome5 Dice














































































































	<code>\faDice</code>		<code>\faDiceFive</code>		<code>\faDiceSix</code>
	<code>\faDiceD20</code>		<code>\faDiceFour</code>		<code>\faDiceThree</code>
	<code>\faDiceD6</code>		<code>\faDiceOne</code>		<code>\faDiceTwo</code>

TABLE 528: utfsym Domino Tiles













































	<code>\usym{1F030}</code>		<code>\usym{1F049}</code>		<code>\usym{1F062}</code>		<code>\usym{1F07B}</code>
	<code>\usym{1F031}</code>		<code>\usym{1F04A}</code>		<code>\usym{1F063}</code>		<code>\usym{1F07C}</code>
	<code>\usym{1F032}</code>		<code>\usym{1F04B}</code>		<code>\usym{1F064}</code>		<code>\usym{1F07D}</code>
	<code>\usym{1F033}</code>		<code>\usym{1F04C}</code>		<code>\usym{1F065}</code>		<code>\usym{1F07E}</code>
	<code>\usym{1F034}</code>		<code>\usym{1F04D}</code>		<code>\usym{1F066}</code>		<code>\usym{1F07F}</code>
	<code>\usym{1F035}</code>		<code>\usym{1F04E}</code>		<code>\usym{1F067}</code>		<code>\usym{1F080}</code>
	<code>\usym{1F036}</code>		<code>\usym{1F04F}</code>		<code>\usym{1F068}</code>		<code>\usym{1F081}</code>
	<code>\usym{1F037}</code>		<code>\usym{1F050}</code>		<code>\usym{1F069}</code>		<code>\usym{1F082}</code>
	<code>\usym{1F038}</code>		<code>\usym{1F051}</code>		<code>\usym{1F06A}</code>		<code>\usym{1F083}</code>
	<code>\usym{1F039}</code>		<code>\usym{1F052}</code>		<code>\usym{1F06B}</code>		<code>\usym{1F084}</code>
	<code>\usym{1F03A}</code>		<code>\usym{1F053}</code>		<code>\usym{1F06C}</code>		<code>\usym{1F085}</code>
	<code>\usym{1F03B}</code>		<code>\usym{1F054}</code>		<code>\usym{1F06D}</code>		<code>\usym{1F086}</code>
	<code>\usym{1F03C}</code>		<code>\usym{1F055}</code>		<code>\usym{1F06E}</code>		<code>\usym{1F087}</code>
	<code>\usym{1F03D}</code>		<code>\usym{1F056}</code>		<code>\usym{1F06F}</code>		<code>\usym{1F088}</code>
	<code>\usym{1F03E}</code>		<code>\usym{1F057}</code>		<code>\usym{1F070}</code>		<code>\usym{1F089}</code>
	<code>\usym{1F03F}</code>		<code>\usym{1F058}</code>		<code>\usym{1F071}</code>		<code>\usym{1F08A}</code>
	<code>\usym{1F040}</code>		<code>\usym{1F059}</code>		<code>\usym{1F072}</code>		<code>\usym{1F08B}</code>
	<code>\usym{1F041}</code>		<code>\usym{1F05A}</code>		<code>\usym{1F073}</code>		<code>\usym{1F08C}</code>
	<code>\usym{1F042}</code>		<code>\usym{1F05B}</code>		<code>\usym{1F074}</code>		<code>\usym{1F08D}</code>
	<code>\usym{1F043}</code>		<code>\usym{1F05C}</code>		<code>\usym{1F075}</code>		<code>\usym{1F08E}</code>
	<code>\usym{1F044}</code>		<code>\usym{1F05D}</code>		<code>\usym{1F076}</code>		<code>\usym{1F08F}</code>
	<code>\usym{1F045}</code>		<code>\usym{1F05E}</code>		<code>\usym{1F077}</code>		<code>\usym{1F090}</code>
	<code>\usym{1F046}</code>		<code>\usym{1F05F}</code>		<code>\usym{1F078}</code>		<code>\usym{1F091}</code>
	<code>\usym{1F047}</code>		<code>\usym{1F060}</code>		<code>\usym{1F079}</code>		<code>\usym{1F092}</code>
	<code>\usym{1F048}</code>		<code>\usym{1F061}</code>		<code>\usym{1F07A}</code>		<code>\usym{1F093}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, “`\usymH{1F089}{36pt}`” produces



See the `utfsym` documentation for more information.

TABLE 529: utfsym Mahjong Tiles



 <code>\usym{1F000}</code>	 <code>\usym{1F00B}</code>	 <code>\usym{1F016}</code>	 <code>\usym{1F021}</code>
 <code>\usym{1F001}</code>	 <code>\usym{1F00C}</code>	 <code>\usym{1F017}</code>	 <code>\usym{1F022}</code>
 <code>\usym{1F002}</code>	 <code>\usym{1F00D}</code>	 <code>\usym{1F018}</code>	 <code>\usym{1F023}</code>
 <code>\usym{1F003}</code>	 <code>\usym{1F00E}</code>	 <code>\usym{1F019}</code>	 <code>\usym{1F024}</code>
 <code>\usym{1F004}</code>	 <code>\usym{1F00F}</code>	 <code>\usym{1F01A}</code>	 <code>\usym{1F025}</code>
 <code>\usym{1F005}</code>	 <code>\usym{1F010}</code>	 <code>\usym{1F01B}</code>	 <code>\usym{1F026}</code>
 <code>\usym{1F006}</code>	 <code>\usym{1F011}</code>	 <code>\usym{1F01C}</code>	 <code>\usym{1F027}</code>
 <code>\usym{1F007}</code>	 <code>\usym{1F012}</code>	 <code>\usym{1F01D}</code>	 <code>\usym{1F028}</code>
 <code>\usym{1F008}</code>	 <code>\usym{1F013}</code>	 <code>\usym{1F01E}</code>	 <code>\usym{1F029}</code>
 <code>\usym{1F009}</code>	 <code>\usym{1F014}</code>	 <code>\usym{1F01F}</code>	 <code>\usym{1F02A}</code>
 <code>\usym{1F00A}</code>	 <code>\usym{1F015}</code>	 <code>\usym{1F020}</code>	 <code>\usym{1F02B}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, “`\usymH{1F00B}{36pt}`” produces



See the `utfsym` documentation for more information.

TABLE 530: utfsym Chess Pieces

 <code>\usym{2654}</code>	 <code>\usym{2657}</code>	 <code>\usym{265A}</code>	 <code>\usym{265D}</code>
 <code>\usym{2655}</code>	 <code>\usym{2658}</code>	 <code>\usym{265B}</code>	 <code>\usym{265E}</code>
 <code>\usym{2656}</code>	 <code>\usym{2659}</code>	 <code>\usym{265C}</code>	 <code>\usym{265F}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.



TABLE 531: skak Chess Informator Symbols

	<code>\bbetter</code>		<code>\doublepawns</code>		<code>\seppawns</code>
$-+$	<code>\bdecisive</code>	$\perp$	<code>\ending</code>	$O-O$	<code>\shortcastling</code>
$\cup$	<code>\betteris</code>	$=$	<code>\equal</code>	$\oplus$	<code>\timelimit</code>
	<code>\bishoppair</code>	$\leftrightarrow$	<code>\file</code>	$\infty$	<code>\unclear</code>
$\mp$	<code>\bupperhand</code>	$\gg$	<code>\kside</code>	$\circ\circ$	<code>\unitedpawns</code>
$\times$	<code>\capturesymbol</code>	$O-O-O$	<code>\longcastling</code>	$R$	<code>\various</code>
$O$	<code>\castlingchar</code>	$\times$	<code>\markera</code>	$\pm$	<code>\wbetter</code>
$-$	<code>\castlinghyphen</code>	$O$	<code>\markerb</code>	$+ -$	<code>\wdecisive</code>
	<code>\centre</code>	$\#$	<code>\mate</code>	$\times$	<code>\weakpt</code>
$+$	<code>\checksymbol</code>	$>$	<code>\morepawns</code>	$\perp$	<code>\with</code>
$RR$	<code>\chesscomment</code>	$O$	<code>\moreroom</code>	$\rightarrow$	<code>\withattack</code>
$\parallel$	<code>\chessetc</code>	$N$	<code>\novelty</code>	$\triangle$	<code>\withidea</code>
$-$	<code>\chesssee</code>	$\square$	<code>\onlymove</code>	$\uparrow$	<code>\withinitt</code>
	<code>\compensation</code>		<code>\opposbishops</code>	$\perp$	<code>\without</code>
	<code>\counterplay</code>	$\circ$	<code>\passedpawn</code>	$\pm$	<code>\wupperhand</code>
$\circlearrowleft$	<code>\devadvantage</code>	$\ll$	<code>\qside</code>	$\odot$	<code>\zugzwang</code>
	<code>\diagonal</code>		<code>\samebishops</code>		

TABLE 532: skak Chess Pieces and Chessboard Squares

	<code>\BlackBishopOnBlack</code>		<code>\BlackRookOnBlack</code>		<code>\WhiteKingOnBlack</code>
	<code>\BlackBishopOnWhite</code>		<code>\BlackRookOnWhite</code>		<code>\WhiteKingOnWhite</code>
	<code>\BlackEmptySquare</code>		<code>\symbishop</code>		<code>\WhiteKnightOnBlack</code>
	<code>\BlackKingOnBlack</code>		<code>\symking</code>		<code>\WhiteKnightOnWhite</code>
	<code>\BlackKingOnWhite</code>		<code>\symknight</code>		<code>\WhitePawnOnBlack</code>
	<code>\BlackKnightOnBlack</code>		<code>\sympawn</code>		<code>\WhitePawnOnWhite</code>
	<code>\BlackKnightOnWhite</code>		<code>\symqueen</code>		<code>\WhiteQueenOnBlack</code>
	<code>\BlackPawnOnBlack</code>		<code>\symrook</code>		<code>\WhiteQueenOnWhite</code>
	<code>\BlackPawnOnWhite</code>		<code>\WhiteBishopOnBlack</code>		<code>\WhiteRookOnBlack</code>
	<code>\BlackQueenOnBlack</code>		<code>\WhiteBishopOnWhite</code>		<code>\WhiteRookOnWhite</code>
	<code>\BlackQueenOnWhite</code>		<code>\WhiteEmptySquare</code>		

The skak package also provides commands for drawing complete chessboards. See the skak documentation for more information.

TABLE 533: fontawesome5 Chess Pieces and Chessboards



























	<code>\faChess</code>		<code>\faChessKing</code>		<code>\faChessQueen</code>
	<code>\faChessBishop</code>		<code>\faChessKnight</code>		<code>\faChessRook</code>
	<code>\faChessBoard</code>		<code>\faChessPawn</code>		













TABLE 534: igo Go Symbols













	<code>\blackstone[\igocircle]</code>		<code>\whitestone[\igocircle]</code>
	<code>\blackstone[\igocross]</code>		<code>\whitestone[\igocross]</code>
	<code>\blackstone[\igonone]</code>		<code>\whitestone[\igonone]</code>
	<code>\blackstone[\igosquare]</code>		<code>\whitestone[\igosquare]</code>
	<code>\blackstone[\igotriangle]</code>		<code>\whitestone[\igotriangle]</code>

In addition to the symbols shown above, igo's `\blackstone` and `\whitestone` commands accept numbers from 1 to 99 and display them circled as , , , ...,  and , , , ..., , respectively.

The igo package is intended to typeset complete Go boards (goban). See the igo documentation for more information.

TABLE 535: go Go Symbols

	<code>\botborder</code>		<code>\leftbotcorner</code>		<code>\rttopcorner</code>
	<code>\empty</code>		<code>\lefttopcorner</code>		<code>\square</code>
	<code>\hoshi</code>		<code>\rtborder</code>		<code>\topborder</code>
	<code>\leftborder</code>		<code>\rtbotcorner</code>		<code>\triangle</code>

In addition to the board fragments and stones shown above, go's `\black` and `\white` commands accept numbers from 1 to 253 and display them circled as , , , ...,  and , , , ..., , respectively. `\black` and `\white` additionally accept `\square` and `\triangle` as arguments, producing  and  for `\black` and  and  for `\white`.

The go package is intended to typeset complete Go boards (goban). See the go documentation for more information.

TABLE 536: fontawesome5 Sports





















	<code>\faBaseballBall</code>		<code>\faFootballBall</code>		<code>\faSkiing</code>
	<code>\faBasketballBall</code>		<code>\faFutbol</code>		<code>\faSkiingNordic</code>
	<code>\faBiking</code>		<code>\faFutbol[regular]</code>		<code>\faSnowboarding</code>
	<code>\faBowlingBall</code>		<code>\faGolfBall</code>		<code>\faSwimmer</code>
	<code>\faDribbble</code>		<code>\faHockeyPuck</code>		<code>\faTableTennis</code>
	<code>\faDribbbleSquare</code>		<code>\faQuidditch</code>		<code>\faVolleyballBall</code>
	<code>\faDumbbell</code>		<code>\faSkating</code>		

TABLE 537: utfsym Games and Sports

	<code>\usym{1F3AE}</code>		<code>\usym{1F3BF}</code>		<code>\usym{1F3C6}</code>		<code>\usym{1F3CF}</code>
	<code>\usym{1F3AF}</code>		<code>\usym{1F3C0}</code>		<code>\usym{1F3C7}</code>		<code>\usym{1F3D0}</code>
	<code>\usym{1F3B0}</code>		<code>\usym{1F3C1}</code>		<code>\usym{1F3C8}</code>		<code>\usym{1F3D1}</code>
	<code>\usym{1F3B1}</code>		<code>\usym{1F3C2}</code>		<code>\usym{1F3C9}</code>		<code>\usym{1F3D2}</code>
	<code>\usym{1F3B2}</code>		<code>\usym{1F3C3}</code>		<code>\usym{1F3CA}</code>		<code>\usym{1F3D3}</code>
	<code>\usym{1F3B3}</code>		<code>\usym{1F3C4}</code>		<code>\usym{1F3CB}</code>		<code>\usym{1F3F8}</code>
	<code>\usym{1F3BE}</code>		<code>\usym{1F3C5}</code>		<code>\usym{1F3CC}</code>		<code>\usym{1F3F9}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, “`\usymH{1F3B0}{36pt}`” produces








See the `utfsym` documentation for more information.

## Chapter 9

# Geographical Symbols

The symbols in this chapter relate in some manner to geography. In particular, the following tables present both maps and national and regional flags.

TABLE 538: `countriesofeuropa` Country Maps

	<code>\Albania</code>		<code>\Latvia</code>
	<code>\Andorra</code>		<code>\Liechtenstein</code>
	<code>\Austria</code>		<code>\Lithuania</code>
	<code>\Belarus</code>		<code>\Luxembourg</code>
	<code>\Belgium</code>		<code>\Macedonia</code>
	<code>\Bosnia</code>		<code>\Malta</code>
	<code>\Bulgaria</code>		<code>\Moldova</code>
	<code>\Croatia</code>		<code>\Montenegro</code>
	<code>\Czechia</code>		<code>\Netherlands</code>

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The preceding commands work only when the `CountriesOfEurope` font family is active. For convenience, the package defines a `\countriesofeuropfamily` command that switches to that font family.














By default, countries are drawn in the current font size. Hence, “`{\countriesofeuropfamily\France}`” draws a nearly unrecognizable “”. For clarity of presentation, Table 538 scales each glyph to 72 pt. via an explicit `\fontsize{72}{72}`. An alternative is to specify the scaled package option to scale all country glyphs by a given factor of the font size.

TABLE 539: rojud Maps of Romanian Counties

	<code>\jAB</code>		<code>\jCT</code>		<code>\jMS</code>
	<code>\jAG</code>		<code>\jCV</code>		<code>\jNT</code>
	<code>\jAR</code>		<code>\jDB</code>		<code>\jOT</code>
	<code>\jBC</code>		<code>\jDJ</code>		<code>\jPH</code>
	<code>\jBH</code>		<code>\jGJ</code>		<code>\jSB</code>
	<code>\jBI</code>		<code>\jGL</code>		<code>\jSJ</code>
	<code>\jBN</code>		<code>\jGR</code>		<code>\jSM</code>
	<code>\jBR</code>		<code>\jHD</code>		<code>\jSV</code>
	<code>\jBT</code>		<code>\jHR</code>		<code>\jTL</code>
	<code>\jBV</code>		<code>\jIF</code>		<code>\jTM</code>

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	<code>\jBZ</code>		<code>\jIL</code>		<code>\jTR</code>
	<code>\jCJ</code>		<code>\jIS</code>		<code>\jVL</code>
	<code>\jCL</code>		<code>\jMH</code>		<code>\jVN</code>
	<code>\jCS</code>		<code>\jMM</code>		<code>\jVS</code>

The preceding commands work only when the `rojud` font family is active. Use the OT1 font encoding in `pdfLATEX` and the TU font encoding in `XYLATEX`. (`rojud` requires one of those two T<sub>E</sub>X engines.) For example, “`{\usefont{OT1}{rojud}{m}{n}\jBI}`” draws Bucharest.<sup>a</sup>

<sup>a</sup>technically a municipality, not a county

TABLE 540: `euflag` European Union Flag



`\euflag`

The `\euflag` flag is drawn using the L<sup>A</sup>T<sub>E</sub>X `picture` environment.



TABLE 541: worldflags Flags of Sovereign States

	<code>\worldflag{AD}</code>		<code>\worldflag{EC}</code>		<code>\worldflag{LC}</code>		<code>\worldflag{RW}</code>
	<code>\worldflag{AE}</code>		<code>\worldflag{EE}</code>		<code>\worldflag{LI}</code>		<code>\worldflag{SA}</code>
	<code>\worldflag{AF}</code>		<code>\worldflag{EG}</code>		<code>\worldflag{LK}</code>		<code>\worldflag{SB}</code>
	<code>\worldflag{AG}</code>		<code>\worldflag{ER}</code>		<code>\worldflag{LR}</code>		<code>\worldflag{SC}</code>
	<code>\worldflag{AL}</code>		<code>\worldflag{ES}</code>		<code>\worldflag{LS}</code>		<code>\worldflag{SD}</code>
	<code>\worldflag{AM}</code>		<code>\worldflag{ET}</code>		<code>\worldflag{LT}</code>		<code>\worldflag{SE}</code>
	<code>\worldflag{AO}</code>		<code>\worldflag{FI}</code>		<code>\worldflag{LU}</code>		<code>\worldflag{SG}</code>
	<code>\worldflag{AR}</code>		<code>\worldflag{FJ}</code>		<code>\worldflag{LV}</code>		<code>\worldflag{SI}</code>
	<code>\worldflag{AT}</code>		<code>\worldflag{FM}</code>		<code>\worldflag{LY}</code>		<code>\worldflag{SK}</code>
	<code>\worldflag{AU}</code>		<code>\worldflag{FR}</code>		<code>\worldflag{MA}</code>		<code>\worldflag{SL}</code>
	<code>\worldflag{AZ}</code>		<code>\worldflag{GA}</code>		<code>\worldflag{MD}</code>		<code>\worldflag{SM}</code>
	<code>\worldflag{BA}</code>		<code>\worldflag{GB}</code>		<code>\worldflag{ME}</code>		<code>\worldflag{SN}</code>
	<code>\worldflag{BB}</code>		<code>\worldflag{GD}</code>		<code>\worldflag{MG}</code>		<code>\worldflag{SO}</code>
	<code>\worldflag{BD}</code>		<code>\worldflag{GE}</code>		<code>\worldflag{MH}</code>		<code>\worldflag{SR}</code>
	<code>\worldflag{BE}</code>		<code>\worldflag{GH}</code>		<code>\worldflag{MK}</code>		<code>\worldflag{SS}</code>
	<code>\worldflag{BF}</code>		<code>\worldflag{GM}</code>		<code>\worldflag{ML}</code>		<code>\worldflag{ST}</code>
	<code>\worldflag{BG}</code>		<code>\worldflag{GN}</code>		<code>\worldflag{MM}</code>		<code>\worldflag{SV}</code>
	<code>\worldflag{BH}</code>		<code>\worldflag{GQ}</code>		<code>\worldflag{MN}</code>		<code>\worldflag{SY}</code>
	<code>\worldflag{BI}</code>		<code>\worldflag{GR}</code>		<code>\worldflag{MR}</code>		<code>\worldflag{SZ}</code>
	<code>\worldflag{BJ}</code>		<code>\worldflag{GT}</code>		<code>\worldflag{MT}</code>		<code>\worldflag{TD}</code>
	<code>\worldflag{BN}</code>		<code>\worldflag{GW}</code>		<code>\worldflag{MU}</code>		<code>\worldflag{TG}</code>
	<code>\worldflag{BO}</code>		<code>\worldflag{GY}</code>		<code>\worldflag{MV}</code>		<code>\worldflag{TH}</code>
	<code>\worldflag{BR}</code>		<code>\worldflag{HN}</code>		<code>\worldflag{MW}</code>		<code>\worldflag{TJ}</code>
	<code>\worldflag{BS}</code>		<code>\worldflag{HR}</code>		<code>\worldflag{MX}</code>		<code>\worldflag{TL}</code>
	<code>\worldflag{BT}</code>		<code>\worldflag{HT}</code>		<code>\worldflag{MY}</code>		<code>\worldflag{TM}</code>
	<code>\worldflag{BW}</code>		<code>\worldflag{HU}</code>		<code>\worldflag{MZ}</code>		<code>\worldflag{TN}</code>
	<code>\worldflag{BY}</code>		<code>\worldflag{ID}</code>		<code>\worldflag{NA}</code>		<code>\worldflag{TO}</code>
	<code>\worldflag{BZ}</code>		<code>\worldflag{IE}</code>		<code>\worldflag{NE}</code>		<code>\worldflag{TR}</code>
	<code>\worldflag{CA}</code>		<code>\worldflag{IL}</code>		<code>\worldflag{NG}</code>		<code>\worldflag{TT}</code>
	<code>\worldflag{CD}</code>		<code>\worldflag{IN}</code>		<code>\worldflag{NI}</code>		<code>\worldflag{TV}</code>
	<code>\worldflag{CF}</code>		<code>\worldflag{IQ}</code>		<code>\worldflag{NL}</code>		<code>\worldflag{TW}</code>
	<code>\worldflag{CG}</code>		<code>\worldflag{IR}</code>		<code>\worldflag{NO}</code>		<code>\worldflag{TZ}</code>
	<code>\worldflag{CH}</code>		<code>\worldflag{IS}</code>		<code>\worldflag{NP}</code>		<code>\worldflag{UA}</code>
	<code>\worldflag{CI}</code>		<code>\worldflag{IT}</code>		<code>\worldflag{NR}</code>		<code>\worldflag{UG}</code>

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	<code>\worldflag{CK}</code>		<code>\worldflag{JM}</code>		<code>\worldflag{NZ}</code>		<code>\worldflag{US}</code>
	<code>\worldflag{CL}</code>		<code>\worldflag{JO}</code>		<code>\worldflag{OM}</code>		<code>\worldflag{UY}</code>
	<code>\worldflag{CM}</code>		<code>\worldflag{JP}</code>		<code>\worldflag{PA}</code>		<code>\worldflag{UZ}</code>
	<code>\worldflag{CN}</code>		<code>\worldflag{KE}</code>		<code>\worldflag{PE}</code>		<code>\worldflag{VA}</code>
	<code>\worldflag{CO}</code>		<code>\worldflag{KG}</code>		<code>\worldflag{PG}</code>		<code>\worldflag{VC}</code>
	<code>\worldflag{CR}</code>		<code>\worldflag{KH}</code>		<code>\worldflag{PH}</code>		<code>\worldflag{VE}</code>
	<code>\worldflag{CU}</code>		<code>\worldflag{KI}</code>		<code>\worldflag{PK}</code>		<code>\worldflag{VN}</code>
	<code>\worldflag{CV}</code>		<code>\worldflag{KM}</code>		<code>\worldflag{PL}</code>		<code>\worldflag{VU}</code>
	<code>\worldflag{CY}</code>		<code>\worldflag{KN}</code>		<code>\worldflag{PS}</code>		<code>\worldflag{WS}</code>
	<code>\worldflag{CZ}</code>		<code>\worldflag{KO}</code>		<code>\worldflag{PT}</code>		<code>\worldflag{YE}</code>
	<code>\worldflag{DE}</code>		<code>\worldflag{KP}</code>		<code>\worldflag{PW}</code>		<code>\worldflag{ZA}</code>
	<code>\worldflag{DJ}</code>		<code>\worldflag{KR}</code>		<code>\worldflag{PY}</code>		<code>\worldflag{ZM}</code>
	<code>\worldflag{DK}</code>		<code>\worldflag{KW}</code>		<code>\worldflag{QA}</code>		<code>\worldflag{ZW}</code>
	<code>\worldflag{DM}</code>		<code>\worldflag{KZ}</code>		<code>\worldflag{RO}</code>		
	<code>\worldflag{DO}</code>		<code>\worldflag{LA}</code>		<code>\worldflag{RS}</code>		
	<code>\worldflag{DZ}</code>		<code>\worldflag{LB}</code>		<code>\worldflag{RU}</code>		










All worldflags symbols are implemented with TikZ graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

TABLE 542: worldflags Flags of Non-Sovereign Countries and Territories

	<code>\worldflag{Abkhazia}</code>		<code>\worldflag{GF}</code>		<code>\worldflag{PR}</code>
	<code>\worldflag{AQ}</code>		<code>\worldflag{GG}</code>		<code>\worldflag{RE}</code>
	<code>\worldflag{Artsakh}</code>		<code>\worldflag{GI}</code>		<code>\worldflag{Saba}</code>
	<code>\worldflag{AX}</code>		<code>\worldflag{GL}</code>		<code>\worldflag{Somaliland}</code>
	<code>\worldflag{Bonaire}</code>		<code>\worldflag{IM}</code>		<code>\worldflag{StEustasius}</code>
	<code>\worldflag{EH}</code>		<code>\worldflag{JE}</code>		<code>\worldflag{Tibet}</code>
	<code>\worldflag{FO}</code>		<code>\worldflag{NU}</code>		<code>\worldflag{Transnistria}</code>



























































All worldflags symbols are implemented with TikZ graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

TABLE 543: worldflags Flags of Austrian Federal States

	<code>\worldflag{AT-B}</code>		<code>\worldflag{AT-O}</code>		<code>\worldflag{AT-T}</code>
	<code>\worldflag{AT-K}</code>		<code>\worldflag{AT-S}</code>		<code>\worldflag{AT-V}</code>
	<code>\worldflag{AT-N}</code>		<code>\worldflag{AT-St}</code>		<code>\worldflag{AT-W}</code>















































































All `worldflags` symbols are implemented with `TikZ` graphics, not with a font. The package provides a number of options for controlling flag size and style. See the `worldflags` documentation for more information.

TABLE 544: twemojis Flags

	<code>\twemoji{flag: Åland Islands}</code>		<code>\twemoji{flag: Lesotho}</code>
	<code>\twemoji{flag: Afghanistan}</code>		<code>\twemoji{flag: Liberia}</code>
	<code>\twemoji{flag: Albania}</code>		<code>\twemoji{flag: Libya}</code>
	<code>\twemoji{flag: Algeria}</code>		<code>\twemoji{flag: Liechtenstein}</code>
	<code>\twemoji{flag: American Samoa}</code>		<code>\twemoji{flag: Lithuania}</code>
	<code>\twemoji{flag: Andorra}</code>		<code>\twemoji{flag: Luxembourg}</code>
	<code>\twemoji{flag: Angola}</code>		<code>\twemoji{flag: Macao SAR China}</code>
	<code>\twemoji{flag: Anguilla}</code>		<code>\twemoji{flag: Madagascar}</code>
	<code>\twemoji{flag: Antarctica}</code>		<code>\twemoji{flag: Malawi}</code>
	<code>\twemoji{flag: Antigua &amp; Barbuda}</code>		<code>\twemoji{flag: Malaysia}</code>
	<code>\twemoji{flag: Argentina}</code>		<code>\twemoji{flag: Maldives}</code>
	<code>\twemoji{flag: Armenia}</code>		<code>\twemoji{flag: Mali}</code>
	<code>\twemoji{flag: Aruba}</code>		<code>\twemoji{flag: Malta}</code>
	<code>\twemoji{flag: Ascension Island}</code>		<code>\twemoji{flag: Marshall Islands}</code>
	<code>\twemoji{flag: Australia}</code>		<code>\twemoji{flag: Martinique}</code>
	<code>\twemoji{flag: Austria}</code>		<code>\twemoji{flag: Mauritania}</code>
	<code>\twemoji{flag: Azerbaijan}</code>		<code>\twemoji{flag: Mauritius}</code>
	<code>\twemoji{flag: Bahamas}</code>		<code>\twemoji{flag: Mayotte}</code>
	<code>\twemoji{flag: Bahrain}</code>		<code>\twemoji{flag: Mexico}</code>
	<code>\twemoji{flag: Bangladesh}</code>		<code>\twemoji{flag: Micronesia}</code>
	<code>\twemoji{flag: Barbados}</code>		<code>\twemoji{flag: Moldova}</code>
	<code>\twemoji{flag: Belarus}</code>		<code>\twemoji{flag: Monaco}</code>
	<code>\twemoji{flag: Belgium}</code>		<code>\twemoji{flag: Mongolia}</code>
	<code>\twemoji{flag: Belize}</code>		<code>\twemoji{flag: Montenegro}</code>
	<code>\twemoji{flag: Benin}</code>		<code>\twemoji{flag: Montserrat}</code>
	<code>\twemoji{flag: Bermuda}</code>		<code>\twemoji{flag: Morocco}</code>
	<code>\twemoji{flag: Bhutan}</code>		<code>\twemoji{flag: Mozambique}</code>
	<code>\twemoji{flag: Bolivia}</code>		<code>\twemoji{flag: Myanmar (Burma)}</code>
	<code>\twemoji{flag: Bosnia &amp; Herzegovina}</code>		<code>\twemoji{flag: Namibia}</code>

















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 \twemoji{flag: Botswana}	 \twemoji{flag: Nauru}
 \twemoji{flag: Bouvet Island}	 \twemoji{flag: Nepal}
 \twemoji{flag: Brazil}	 \twemoji{flag: Netherlands}
 \twemoji{flag: British Indian Ocean Territory}	 \twemoji{flag: New Caledonia}
 \twemoji{flag: British Virgin Islands}	 \twemoji{flag: New Zealand}
 \twemoji{flag: Brunei}	 \twemoji{flag: Nicaragua}
 \twemoji{flag: Bulgaria}	 \twemoji{flag: Nigeria}
 \twemoji{flag: Burkina Faso}	 \twemoji{flag: Niger}
 \twemoji{flag: Burundi}	 \twemoji{flag: Niue}
 \twemoji{flag: Cambodia}	 \twemoji{flag: Norfolk Island}
 \twemoji{flag: Cameroon}	 \twemoji{flag: North Korea}
 \twemoji{flag: Canada}	 \twemoji{flag: North Macedonia}
 \twemoji{flag: Canary Islands}	 \twemoji{flag: Northern Mariana Islands}
 \twemoji{flag: Cape Verde}	 \twemoji{flag: Norway}
 \twemoji{flag: Caribbean Netherlands}	 \twemoji{flag: Oman}
 \twemoji{flag: Cayman Islands}	 \twemoji{flag: Pakistan}
 \twemoji{flag: Central African Republic}	 \twemoji{flag: Palau}
 \twemoji{flag: Ceuta & Melilla}	 \twemoji{flag: Palestinian Territories}
 \twemoji{flag: Chad}	 \twemoji{flag: Panama}
 \twemoji{flag: Chile}	 \twemoji{flag: Papua New Guinea}
 \twemoji{flag: China}	 \twemoji{flag: Paraguay}
 \twemoji{flag: Christmas Island}	 \twemoji{flag: Peru}
 \twemoji{flag: Clipperton Island}	 \twemoji{flag: Philippines}
 \twemoji{flag: Cocos (Keeling) Islands}	 \twemoji{flag: Pitcairn Islands}
 \twemoji{flag: Colombia}	 \twemoji{flag: Poland}
 \twemoji{flag: Comoros}	 \twemoji{flag: Portugal}
 \twemoji{flag: Congo - Brazzaville}	 \twemoji{flag: Puerto Rico}
 \twemoji{flag: Congo - Kinshasa}	 \twemoji{flag: Qatar}
 \twemoji{flag: Cook Islands}	 \twemoji{flag: Romania}
 \twemoji{flag: Costa Rica}	 \twemoji{flag: Russia}
 \twemoji{flag: Croatia}	 \twemoji{flag: Rwanda}
 \twemoji{flag: Cuba}	 \twemoji{flag: Réunion}
 \twemoji{flag: Curaçao}	 \twemoji{flag: Samoa}
 \twemoji{flag: Cyprus}	 \twemoji{flag: San Marino}
 \twemoji{flag: Czechia}	 \twemoji{flag: Saudi Arabia}
 \twemoji{flag: Côte d'Ivoire}	 \twemoji{flag: Scotland}
 \twemoji{flag: Denmark}	 \twemoji{flag: Senegal}
 \twemoji{flag: Diego Garcia}	 \twemoji{flag: Serbia}
 \twemoji{flag: Djibouti}	 \twemoji{flag: Seychelles}














































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 \twemoji{flag: Dominican Republic}	 \twemoji{flag: Sierra Leone}
 \twemoji{flag: Dominica}	 \twemoji{flag: Singapore}
 \twemoji{flag: Ecuador}	 \twemoji{flag: Sint Maarten}
 \twemoji{flag: Egypt}	 \twemoji{flag: Slovakia}
 \twemoji{flag: El Salvador}	 \twemoji{flag: Slovenia}
 \twemoji{flag: England}	 \twemoji{flag: Solomon Islands}
 \twemoji{flag: Equatorial Guinea}	 \twemoji{flag: Somalia}
 \twemoji{flag: Eritrea}	 \twemoji{flag: South Africa}
 \twemoji{flag: Estonia}	 \twemoji{flag: South Georgia & South Sandwich Islands}
 \twemoji{flag: Eswatini}	 \twemoji{flag: South Korea}
 \twemoji{flag: Ethiopia}	 \twemoji{flag: South Sudan}
 \twemoji{flag: European Union}	 \twemoji{flag: Spain}
 \twemoji{flag: Falkland Islands}	 \twemoji{flag: Sri Lanka}
 \twemoji{flag: Faroe Islands}	 \twemoji{flag: St. Barthélemy}
 \twemoji{flag: Fiji}	 \twemoji{flag: St. Helena}
 \twemoji{flag: Finland}	 \twemoji{flag: St. Kitts & Nevis}
 \twemoji{flag: France}	 \twemoji{flag: St. Lucia}
 \twemoji{flag: French Guiana}	 \twemoji{flag: St. Martin}
 \twemoji{flag: French Polynesia}	 \twemoji{flag: St. Pierre & Miquelon}
 \twemoji{flag: French Southern Territories}	 \twemoji{flag: St. Vincent & Grenadines}
 \twemoji{flag: Gabon}	 \twemoji{flag: Sudan}
 \twemoji{flag: Gambia}	 \twemoji{flag: Suriname}
 \twemoji{flag: Georgia}	 \twemoji{flag: Svalbard & Jan Mayen}
 \twemoji{flag: Germany}	 \twemoji{flag: Sweden}
 \twemoji{flag: Ghana}	 \twemoji{flag: Switzerland}
 \twemoji{flag: Gibraltar}	 \twemoji{flag: Syria}
 \twemoji{flag: Greece}	 \twemoji{flag: São Tomé & Príncipe}
 \twemoji{flag: Greenland}	 \twemoji{flag: Taiwan}
 \twemoji{flag: Grenada}	 \twemoji{flag: Tajikistan}
 \twemoji{flag: Guadeloupe}	 \twemoji{flag: Tanzania}
 \twemoji{flag: Guam}	 \twemoji{flag: Thailand}
 \twemoji{flag: Guatemala}	 \twemoji{flag: Timor-Leste}
 \twemoji{flag: Guernsey}	 \twemoji{flag: Togo}
 \twemoji{flag: Guinea-Bissau}	 \twemoji{flag: Tokelau}
 \twemoji{flag: Guinea}	 \twemoji{flag: Tonga}
 \twemoji{flag: Guyana}	 \twemoji{flag: Trinidad & Tobago}
 \twemoji{flag: Haiti}	 \twemoji{flag: Tristan da Cunha}
 \twemoji{flag: Heard & McDonald Islands}	 \twemoji{flag: Tunisia}
 \twemoji{flag: Honduras}	 \twemoji{flag: Turkey}
 \twemoji{flag: Hong Kong SAR China}	 \twemoji{flag: Turkmenistan}

*(continued on next page)*

(continued from previous page)

 <code>\twemoji{flag: Hungary}</code>	 <code>\twemoji{flag: Turks &amp; Caicos Islands}</code>
 <code>\twemoji{flag: Iceland}</code>	 <code>\twemoji{flag: Tuvalu}</code>
 <code>\twemoji{flag: India}</code>	 <code>\twemoji{flag: U.S. Outlying Islands}</code>
 <code>\twemoji{flag: Indonesia}</code>	 <code>\twemoji{flag: U.S. Virgin Islands}</code>
 <code>\twemoji{flag: Iran}</code>	 <code>\twemoji{flag: Uganda}</code>
 <code>\twemoji{flag: Iraq}</code>	 <code>\twemoji{flag: Ukraine}</code>
 <code>\twemoji{flag: Ireland}</code>	 <code>\twemoji{flag: United Arab Emirates}</code>
 <code>\twemoji{flag: Isle of Man}</code>	 <code>\twemoji{flag: United Kingdom}</code>
 <code>\twemoji{flag: Israel}</code>	 <code>\twemoji{flag: United Nations}</code>
 <code>\twemoji{flag: Italy}</code>	 <code>\twemoji{flag: United States}</code>
 <code>\twemoji{flag: Jamaica}</code>	 <code>\twemoji{flag: Uruguay}</code>
 <code>\twemoji{flag: Japan}</code>	 <code>\twemoji{flag: Uzbekistan}</code>
 <code>\twemoji{flag: Jersey}</code>	 <code>\twemoji{flag: Vanuatu}</code>
 <code>\twemoji{flag: Jordan}</code>	 <code>\twemoji{flag: Vatican City}</code>
 <code>\twemoji{flag: Kazakhstan}</code>	 <code>\twemoji{flag: Venezuela}</code>
 <code>\twemoji{flag: Kenya}</code>	 <code>\twemoji{flag: Vietnam}</code>
 <code>\twemoji{flag: Kiribati}</code>	 <code>\twemoji{flag: Wales}</code>
 <code>\twemoji{flag: Kosovo}</code>	 <code>\twemoji{flag: Wallis &amp; Futuna}</code>
 <code>\twemoji{flag: Kuwait}</code>	 <code>\twemoji{flag: Western Sahara}</code>
 <code>\twemoji{flag: Kyrgyzstan}</code>	 <code>\twemoji{flag: Yemen}</code>
 <code>\twemoji{flag: Laos}</code>	 <code>\twemoji{flag: Zambia}</code>
 <code>\twemoji{flag: Latvia}</code>	 <code>\twemoji{flag: Zimbabwe}</code>
 <code>\twemoji{flag: Lebanon}</code>	

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

## Chapter 10

# Other symbols

The following are all the symbols that didn't fit neatly or unambiguously into any of the previous chapters. (Do weather symbols belong under "Science and technology"? Should tally markers be considered "mathematics"?) While some of the tables contain clearly related groups of symbols (e.g., symbols related to cooking), others represent motley assortments of whatever the font designer felt like drawing.

TABLE 545: `textcomp` Genealogical Symbols









































































































★	<code>\textborn</code>	∅	<code>\textdivorced</code>	∞	<code>\textmarried</code>
†	<code>\textdied</code>	☞	<code>\textleaf</code>		

TABLE 546: `wasysym` General Symbols

☒	<code>\ataribox</code>	∅	<code>\diameter</code>	⚡	<code>\lightning</code>	☼	<code>\sun</code>
🔔	<code>\bell</code>	▼	<code>\DOWNarrow</code>	☎	<code>\phone</code>	▲	<code>\UParrow</code>
☹	<code>\blacksmiley</code>	☹	<code>\frownie</code>	☞	<code>\pointer</code>	⌘	<code>\wasycmd*</code>
☒	<code>\Bowtie</code>	∅	<code>\invdiameter</code>	🎧	<code>\recorder</code>	⬠	<code>\wasylozenge</code>
!	<code>\brokenvert</code>	✱	<code>\kreuz</code>	▶	<code>\RIGHTarrow</code>		
✓	<code>\checked</code>	◀	<code>\LEFTarrow</code>	↻	<code>\rightturn</code>		
🕒	<code>\clock</code>	↻	<code>\leftturn</code>	☺	<code>\smiley</code>		

\* `wasysym` defines `\applecmd` as a synonym for `\wasycmd`.

TABLE 547: utfsym Transportation Symbols

	<code>\usym{1F3CD}</code>		<code>\usym{1F698}</code>		<code>\usym{1F6B2}</code>		<code>\usym{1F6CC}</code>
	<code>\usym{1F3CE}</code>		<code>\usym{1F699}</code>		<code>\usym{1F6B3}</code>		<code>\usym{1F6CD}</code>
	<code>\usym{1F680}</code>		<code>\usym{1F69A}</code>		<code>\usym{1F6B4}</code>		<code>\usym{1F6CE}</code>
	<code>\usym{1F681}</code>		<code>\usym{1F69B}</code>		<code>\usym{1F6B5}</code>		<code>\usym{1F6CF}</code>
	<code>\usym{1F682}</code>		<code>\usym{1F69C}</code>		<code>\usym{1F6B6}</code>		<code>\usym{1F6D0}</code>
	<code>\usym{1F683}</code>		<code>\usym{1F69D}</code>		<code>\usym{1F6B7}</code>		<code>\usym{1F6D1}</code>
	<code>\usym{1F684}</code>		<code>\usym{1F69E}</code>		<code>\usym{1F6B8}</code>		<code>\usym{1F6D2}</code>
	<code>\usym{1F685}</code>		<code>\usym{1F69F}</code>		<code>\usym{1F6B9}</code>		<code>\usym{1F6E0}</code>
	<code>\usym{1F686}</code>		<code>\usym{1F6A0}</code>		<code>\usym{1F6BA}</code>		<code>\usym{1F6E1}</code>
	<code>\usym{1F687}</code>		<code>\usym{1F6A1}</code>		<code>\usym{1F6BB}</code>		<code>\usym{1F6E2}</code>
	<code>\usym{1F688}</code>		<code>\usym{1F6A2}</code>		<code>\usym{1F6BC}</code>		<code>\usym{1F6E3}</code>
	<code>\usym{1F689}</code>		<code>\usym{1F6A3}</code>		<code>\usym{1F6BD}</code>		<code>\usym{1F6E4}</code>
	<code>\usym{1F68A}</code>		<code>\usym{1F6A4}</code>		<code>\usym{1F6BE}</code>		<code>\usym{1F6E5}</code>
	<code>\usym{1F68B}</code>		<code>\usym{1F6A5}</code>		<code>\usym{1F6BF}</code>		<code>\usym{1F6E6}</code>
	<code>\usym{1F68C}</code>		<code>\usym{1F6A6}</code>		<code>\usym{1F6C0}</code>		<code>\usym{1F6E7}</code>
	<code>\usym{1F68D}</code>		<code>\usym{1F6A7}</code>		<code>\usym{1F6C1}</code>		<code>\usym{1F6E8}</code>
	<code>\usym{1F68E}</code>		<code>\usym{1F6A8}</code>		<code>\usym{1F6C2}</code>		<code>\usym{1F6E9}</code>
	<code>\usym{1F68F}</code>		<code>\usym{1F6A9}</code>		<code>\usym{1F6C3}</code>		<code>\usym{1F6EA}</code>
	<code>\usym{1F690}</code>		<code>\usym{1F6AA}</code>		<code>\usym{1F6C4}</code>		<code>\usym{1F6EB}</code>
	<code>\usym{1F691}</code>		<code>\usym{1F6AB}</code>		<code>\usym{1F6C5}</code>		<code>\usym{1F6EC}</code>
	<code>\usym{1F692}</code>		<code>\usym{1F6AC}</code>		<code>\usym{1F6C6}</code>		<code>\usym{1F6F1}</code>
	<code>\usym{1F693}</code>		<code>\usym{1F6AD}</code>		<code>\usym{1F6C7}</code>		<code>\usym{1F6F2}</code>
	<code>\usym{1F694}</code>		<code>\usym{1F6AE}</code>		<code>\usym{1F6C8}</code>		<code>\usym{1F6F3}</code>
	<code>\usym{1F695}</code>		<code>\usym{1F6AF}</code>		<code>\usym{1F6C9}</code>		<code>\usym{1F6F4}</code>
	<code>\usym{1F696}</code>		<code>\usym{1F6B0}</code>		<code>\usym{1F6CA}</code>		<code>\usym{1F6F5}</code>
	<code>\usym{1F697}</code>		<code>\usym{1F6B1}</code>		<code>\usym{1F6CB}</code>		<code>\usym{1F6F6}</code>




All utfsym symbols are implemented with TikZ graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, “`\usymH{1F6F3}{36pt}`” produces



See the utfsym documentation for more information.



TABLE 548: manfnt Dangerous Bend Symbols

	<code>\dbend</code>		<code>\lhdbend</code>		<code>\reversedvideobend</code>
---	---------------------	---	-----------------------	---	---------------------------------

Note that these symbols descend far beneath the baseline. `manfnt` also defines non-descending versions, which it calls, correspondingly, `\textdbend`, `\textlhdbend`, and `\textreversedvideobend`.

TABLE 549: Miscellaneous manfnt Symbols























	<code>\manboldkidney</code>		<code>\manpenkidney</code>
	<code>\manconcentriccircles</code>		<code>\manquadrifolium</code>
	<code>\manconcentricdiamond</code>		<code>\manquartercircle</code>
	<code>\mancone</code>		<code>\manrotatedquadrifolium</code>
	<code>\mancube</code>		<code>\manrotatedquartercircle</code>
	<code>\manerrarrow</code>		<code>\manstar</code>
	<code>\manfilledquartercircle</code>		<code>\mantilt pennib</code>
	<code>\manhpennib</code>		<code>\mantriangledown</code>
	<code>\manimpossiblecube</code>		<code>\mantriangleright</code>
	<code>\mankidney</code>		<code>\mantriangleup</code>
	<code>\manlhpenkidney</code>		<code>\manvpennib</code>

TABLE 550: marvosym Media Control Symbols



































	<code>\Forward</code>		<code>\MoveDown</code>		<code>\RewindToIndex</code>		<code>\ToTop</code>
	<code>\ForwardToEnd</code>		<code>\MoveUp</code>		<code>\RewindToStart</code>		
	<code>\ForwardToIndex</code>		<code>\Rewind</code>		<code>\ToBottom</code>		

TABLE 551: typicons Media Control Symbols

	<code>\tiEject</code>		<code>\tiMediaPlay</code>		<code>\tiMediaStop</code>
	<code>\tiEjectOutline</code>		<code>\tiMediaPlayOutline</code>		<code>\tiMediaStopOutline</code>
	<code>\tiMediaEject</code>		<code>\tiMediaPlayReverse</code>		<code>\tiPower</code>
	<code>\tiMediaEjectOutline</code>		<code>\tiMediaPlayReverseOutline</code>		<code>\tiPowerOutline</code>
	<code>\tiMediaFastForward</code>		<code>\tiMediaRecord</code>		<code>\tiVolume</code>
	<code>\tiMediaFastForwardOutline</code>		<code>\tiMediaRecordOutline</code>		<code>\tiVolumeDown</code>
	<code>\tiMediaPause</code>		<code>\tiMediaRewind</code>		<code>\tiVolumeMute</code>
	<code>\tiMediaPauseOutline</code>		<code>\tiMediaRewindOutline</code>		<code>\tiVolumeUp</code>

`typicons` requires either `LuaLATEX` or `XYLATEX`.

TABLE 552: fontawesome5 Media Control Symbols

	<code>\faBackward</code>		<code>\faPlayCircle</code>		<code>\faStopCircle[regular]</code>
	<code>\faEject</code>		<code>\faPlayCircle[regular]</code>		<code>\faVolumeDown</code>
	<code>\faFastBackward</code>		<code>\faStepBackward</code>		<code>\faVolumeMute</code>
	<code>\faFastForward</code>		<code>\faStepForward</code>		<code>\faVolumeOff</code>
	<code>\faForward</code>		<code>\faStop</code>		<code>\faVolumeUp</code>
	<code>\faPlay</code>		<code>\faStopCircle</code>		

TABLE 553: utfsym Media Control Symbols

	<code>\usym{1F500}</code>		<code>\usym{1F504}</code>		<code>\usym{1F508}</code>		<code>\usym{1F569}</code>
	<code>\usym{1F501}</code>		<code>\usym{1F505}</code>		<code>\usym{1F509}</code>		<code>\usym{1F56A}</code>
	<code>\usym{1F502}</code>		<code>\usym{1F506}</code>		<code>\usym{1F50A}</code>		
	<code>\usym{1F503}</code>		<code>\usym{1F507}</code>		<code>\usym{1F568}</code>		

All utfsym symbols are implemented with TikZ graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the utfsym documentation for more information.

TABLE 554: typicons Left/Right Pointers

	<code>\tiChevronLeft</code>		<code>\tiChevronRight</code>
	<code>\tiChevronLeftOutline</code>		<code>\tiChevronRightOutline</code>

typicons requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 555: fontawesome5 Up/Down/Left/Right Pointers

	<code>\faAngleDoubleDown</code>		<code>\faCaretRight</code>		<code>\faChevronCircleDown</code>
	<code>\faAngleDoubleLeft</code>		<code>\faCaretSquareDown</code>		<code>\faChevronCircleLeft</code>
	<code>\faAngleDoubleRight</code>		<code>\faCaretSquareDown[regular]</code>		<code>\faChevronCircleRight</code>
	<code>\faAngleDoubleUp</code>		<code>\faCaretSquareLeft</code>		<code>\faChevronCircleUp</code>
	<code>\faAngleDown</code>		<code>\faCaretSquareLeft[regular]</code>		<code>\faChevronDown</code>
	<code>\faAngleLeft</code>		<code>\faCaretSquareRight</code>		<code>\faChevronLeft</code>
	<code>\faAngleRight</code>		<code>\faCaretSquareRight[regular]</code>		<code>\faChevronRight</code>
	<code>\faAngleUp</code>		<code>\faCaretSquareUp</code>		<code>\faChevronUp</code>
	<code>\faCaretDown</code>		<code>\faCaretSquareUp[regular]</code>		
	<code>\faCaretLeft</code>		<code>\faCaretUp</code>		

TABLE 556: marvosym Laundry Symbols

	<code>\AtForty</code>		<code>\Handwash</code>		<code>\ShortNinetyFive</code>
	<code>\AtNinetyFive</code>		<code>\IroningI</code>		<code>\ShortSixty</code>
	<code>\AtSixty</code>		<code>\IroningII</code>		<code>\ShortThirty</code>
	<code>\Bleech</code>		<code>\IroningIII</code>		<code>\SpecialForty</code>
	<code>\CleaningA</code>		<code>\NoBleech</code>		<code>\Tumbler</code>
	<code>\CleaningF</code>		<code>\NoChemicalCleaning</code>		<code>\WashCotton</code>
	<code>\CleaningFF</code>		<code>\NoIroning</code>		<code>\WashSynthetics</code>
	<code>\CleaningP</code>		<code>\NoTumbler</code>		<code>\WashWool</code>
	<code>\CleaningPP</code>		<code>\ShortFifty</code>		
	<code>\Dontwash</code>		<code>\ShortForty</code>		

TABLE 557: Miscellaneous marvosym Symbols

	<code>\Ankh</code>		<code>\CircledA</code>		<code>\Industry</code>		<code>\PointingHand</code>
	<code>\Bat</code>		<code>\ClockLogo</code>		<code>\Info</code>		<code>\Smiley</code>
	<code>\Bicycle</code>		<code>\Coffeecup</code>		<code>\Ladiesroom</code>		<code>\Wheelchair</code>
	<code>\B0Logo</code>		<code>\Cross</code>		<code>\ManFace</code>		<code>\WomanFace</code>
	<code>\B0LogoL</code>		<code>\Football</code>		<code>\MineSign</code>		<code>\WritingHand</code>
	<code>\B0LogoP</code>		<code>\Frowny</code>		<code>\Mundus</code>		<code>\Yinyang</code>
	<code>\Bouquet</code>		<code>\Gentsroom</code>		<code>\MVAT</code>		
	<code>\Celtcross</code>		<code>\Heart</code>		<code>\PeaceDove</code>		

TABLE 558: Miscellaneous universa Symbols

	<code>\bauforms</code>		<code>\bauhead</code>
--	------------------------	--	-----------------------

TABLE 559: Miscellaneous fourier Symbols

	<code>\bomb</code>		<code>\noway</code>		<code>\textxswdown*</code>		<code>\warning</code>
	<code>\grimace</code>		<code>\texttthing*</code>		<code>\textxswup*</code>		

\* fourier defines math-mode synonyms for a few of the preceding symbols: `\thething` (“”), `\xswsup` (“”), and `\xswdown` (“”).

TABLE 560: utfsym Weather Symbols

	<code>\usym{1F321}</code>		<code>\usym{1F324}</code>		<code>\usym{1F327}</code>		<code>\usym{1F32A}</code>
	<code>\usym{1F322}</code>		<code>\usym{1F325}</code>		<code>\usym{1F328}</code>		<code>\usym{1F32B}</code>
	<code>\usym{1F323}</code>		<code>\usym{1F326}</code>		<code>\usym{1F329}</code>		<code>\usym{1F32C}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 561: twemojis Weather Symbols

	<code>\twemoji{cloud}</code>		<code>\twemoji{sun behind cloud}</code>
	<code>\twemoji{cloud with lightning}</code>		<code>\twemoji{sun behind large cloud}</code>
	<code>\twemoji{cloud with lightning and rain}</code>		<code>\twemoji{sun behind rain cloud}</code>
	<code>\twemoji{cloud with rain}</code>		<code>\twemoji{sun behind small cloud}</code>
	<code>\twemoji{cloud with snow}</code>		<code>\twemoji{thermometer}</code>
	<code>\twemoji{fog}</code>		<code>\twemoji{tornado}</code>
	<code>\twemoji{sun}</code>		<code>\twemoji{wind face}</code>

Most `twemojis` symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All `twemojis` symbols are implemented as PDF graphics, not with a font. See also the `hwemoji` package, which enables direct Unicode entry of emoji characters in `pdfLATEX`; the `emoji` package, which provides a `LuaLATEX` interface to different underlying emoji fonts; and the `emo` package, which uses a font if possible, otherwise PDF graphics.












TABLE 562: ifsym Weather Symbols

	<code>\Cloud</code>		<code>\Hail</code>		<code>\Sleet</code>		<code>\WeakRain</code>
	<code>\FilledCloud</code>		<code>\HalfSun</code>		<code>\Snow</code>		<code>\WeakRainCloud</code>
	<code>\FilledRainCloud</code>		<code>\Lightning</code>		<code>\SnowCloud</code>		<code>\FilledSnowCloud</code>
	<code>\FilledSunCloud</code>		<code>\NoSun</code>		<code>\Sun</code>		
	<code>\FilledWeakRainCloud</code>		<code>\Rain</code>		<code>\SunCloud</code>		
	<code>\Fog</code>		<code>\RainCloud</code>		<code>\ThinFog</code>		

In addition, `\Thermo{0}... \Thermo{6}` produce thermometers that are between 0/6 and 6/6 full of mercury:

Similarly, `\wind{sun}{angle}{strength}` will draw wind symbols with a given amount of sun (0–4), a given angle (in degrees), and a given strength in km/h (0–100). For example, `\wind{0}{0}{0}` produces “”, `\wind{2}{0}{0}` produces “”, and `\wind{4}{0}{100}` produces “”.

TABLE 563: typicons Weather Symbols

	<code>\tiThermometer</code>		<code>\tiWeatherPartlySunny</code>		<code>\tiWeatherSunny</code>
	<code>\tiWeatherCloudy</code>		<code>\tiWeatherShower</code>		<code>\tiWeatherWindy</code>
	<code>\tiWeatherDownpour</code>		<code>\tiWeatherSnow</code>		<code>\tiWeatherWindyCloudy</code>
	<code>\tiWeatherNight</code>		<code>\tiWeatherStormy</code>		

typicons requires either LuaL<sup>A</sup>T<sub>E</sub>X or X<sub>L</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 564: fontawesome5 Weather Symbols
































	<code>\faCloud</code>		<code>\faIcicles</code>		<code>\faThermometerEmpty</code>
	<code>\faCloudMeatball</code>		<code>\faSmog</code>		<code>\faThermometerFull</code>
	<code>\faCloudMoon</code>		<code>\faSnowflake</code>		<code>\faThermometerHalf</code>
	<code>\faCloudMoonRain</code>		<code>\faSnowflake[regular]</code>		<code>\faThermometerQuarter</code>
	<code>\faCloudRain</code>		<code>\faSun</code>		<code>\faThermometerThreeQuarters</code>
	<code>\faCloudShowersHeavy</code>		<code>\faSun[regular]</code>		<code>\faWind</code>
	<code>\faCloudSun</code>		<code>\faTemperatureHigh</code>		
	<code>\faCloudSunRain</code>		<code>\faTemperatureLow</code>		

TABLE 565: figchild Weather Symbols

	<code>\fcCloud</code>		<code>\fcCloudC</code>		<code>\fcSunB</code>
	<code>\fcCloudA</code>		<code>\fcSun</code>		<code>\fcThermometerA</code>
	<code>\fcCloudB</code>		<code>\fcSunA</code>		<code>\fcThermometerB</code>

All figchild symbols are implemented with T<sub>i</sub>k<sub>Z</sub> graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

TABLE 566: ifsym Alpine Symbols

























	<code>\SummitSign</code>		<code>\Summit</code>		<code>\SurveySign</code>		<code>\HalfFilledHut</code>
	<code>\StoneMan</code>		<code>\Mountain</code>		<code>\Joch</code>		<code>\VarSummit</code>
	<code>\Hut</code>		<code>\IceMountain</code>		<code>\Flag</code>		
	<code>\FilledHut</code>		<code>\VarMountain</code>		<code>\VarFlag</code>		
	<code>\Village</code>		<code>\VarIceMountain</code>		<code>\Tent</code>		

TABLE 567: ifsym Clocks

	<code>\Interval</code>		<code>\StopWatchStart</code>		<code>\VarClock</code>		<code>\Wecker</code>
	<code>\StopWatchEnd</code>		<code>\Taschenuhr</code>		<code>\VarTaschenuhr</code>		



































ifsym also exports a `\showclock` macro. `\showclock{<hours>}{<minutes>}` outputs a clock displaying the corresponding time. For instance, “`\showclock{5}{40}`” produces “”. `<hours>` must be an integer from 0 to 11, and `<minutes>` must be an integer multiple of 5 from 0 to 55.

TABLE 568: utfsym Clocks

	<code>\usym{1F550}</code>		<code>\usym{1F557}</code>		<code>\usym{1F55E}</code>		<code>\usym{1F565}</code>
	<code>\usym{1F551}</code>		<code>\usym{1F558}</code>		<code>\usym{1F55F}</code>		<code>\usym{1F566}</code>
	<code>\usym{1F552}</code>		<code>\usym{1F559}</code>		<code>\usym{1F560}</code>		<code>\usym{1F567}</code>
	<code>\usym{1F553}</code>		<code>\usym{1F55A}</code>		<code>\usym{1F561}</code>		<code>\usym{1F570}</code>
	<code>\usym{1F554}</code>		<code>\usym{1F55B}</code>		<code>\usym{1F562}</code>		
	<code>\usym{1F555}</code>		<code>\usym{1F55C}</code>		<code>\usym{1F563}</code>		
	<code>\usym{1F556}</code>		<code>\usym{1F55D}</code>		<code>\usym{1F564}</code>		































All utfsym symbols are implemented with TikZ graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the utfsym documentation for more information.

TABLE 569: clock Clocks

<code>\ClockStyle</code>	<code>\ClockFramefalse</code>	<code>\ClockFrametrue</code>
0		
1		
2		
3		

The clock package provides a `\clock` command to typeset an arbitrary time on an analog clock (and `\clocktime` to typeset the document’s build time). For example, the clocks in the above table were produced with `\clock{15}{41}`. Clock symbols are composed from a font of clock-face fragments using one of four values for `\ClockStyle` and either `\ClockFrametrue` or `\ClockFramefalse` as illustrated above. See the clock documentation for more information.

TABLE 570: twemojis Clocks

	<code>\twemoji{one o'clock}</code>		<code>\twemoji{eight-thirty}</code>
	<code>\twemoji{one-thirty}</code>		<code>\twemoji{nine o'clock}</code>
	<code>\twemoji{two o'clock}</code>		<code>\twemoji{nine-thirty}</code>
	<code>\twemoji{two-thirty}</code>		<code>\twemoji{ten o'clock}</code>
	<code>\twemoji{three o'clock}</code>		<code>\twemoji{ten-thirty}</code>
	<code>\twemoji{three-thirty}</code>		<code>\twemoji{eleven o'clock}</code>
	<code>\twemoji{four o'clock}</code>		<code>\twemoji{eleven-thirty}</code>
	<code>\twemoji{four-thirty}</code>		<code>\twemoji{twelve o'clock}</code>
	<code>\twemoji{five o'clock}</code>		<code>\twemoji{twelve-thirty}</code>
	<code>\twemoji{five-thirty}</code>		<code>\twemoji{alarm clock}</code>
	<code>\twemoji{six o'clock}</code>		<code>\twemoji{hourglass done}</code>
	<code>\twemoji{six-thirty}</code>		<code>\twemoji{hourglass not done}</code>
	<code>\twemoji{seven o'clock}</code>		<code>\twemoji{mantelpiece clock}</code>
	<code>\twemoji{seven-thirty}</code>		<code>\twemoji{stopwatch}</code>
	<code>\twemoji{eight o'clock}</code>		<code>\twemoji{timer clock}</code>

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

TABLE 571: typicons Time and Date Symbols

	<code>\tiCalendar</code>		<code>\tiStopwatch</code>		<code>\tiWatch</code>
	<code>\tiCalendarOutline</code>		<code>\tiTime</code>		

typicons requires either LuaL<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 572: fontawesome5 Time and Date Symbols

























	<code>\faBusinessTime</code>		<code>\faCalendarMinus</code>		<code>\faClock[regular]</code>
	<code>\faCalendar*[regular]</code>		<code>\faCalendarMinus[regular]</code>		<code>\faDigitalTachograph</code>
	<code>\faCalendar*</code>		<code>\faCalendarPlus</code>		<code>\faHourglass</code>
	<code>\faCalendar</code>		<code>\faCalendarPlus[regular]</code>		<code>\faHourglass[regular]</code>
	<code>\faCalendar[regular]</code>		<code>\faCalendarTimes</code>		<code>\faHourglassEnd</code>
	<code>\faCalendarCheck</code>		<code>\faCalendarTimes[regular]</code>		<code>\faHourglassHalf</code>
	<code>\faCalendarCheck[regular]</code>		<code>\faCalendarWeek</code>		<code>\faHourglassStart</code>
	<code>\faCalendarDay</code>		<code>\faClock</code>		<code>\faTachometer*</code>


TABLE 573: twemojis Animals

	<code>\twemoji{ant}</code>		<code>\twemoji{microbe}</code>
	<code>\twemoji{baby chick}</code>		<code>\twemoji{monkey}</code>
	<code>\twemoji{badger}</code>		<code>\twemoji{monkey face}</code>
	<code>\twemoji{bat}</code>		<code>\twemoji{mosquito}</code>
	<code>\twemoji{bear}</code>		<code>\twemoji{mouse face}</code>
	<code>\twemoji{beaver}</code>		<code>\twemoji{mouse2}</code>
	<code>\twemoji{beetle}</code>		<code>\twemoji{octopus}</code>
	<code>\twemoji{bird}</code>		<code>\twemoji{orangutan}</code>
	<code>\twemoji{black cat}</code>		<code>\twemoji{otter}</code>
	<code>\twemoji{blowfish}</code>		<code>\twemoji{owl}</code>
	<code>\twemoji{boar}</code>		<code>\twemoji{ox}</code>
	<code>\twemoji{bug}</code>		<code>\twemoji{oyster}</code>
	<code>\twemoji{butterfly}</code>		<code>\twemoji{panda}</code>
	<code>\twemoji{cat face}</code>		<code>\twemoji{parrot}</code>
	<code>\twemoji{cat2}</code>		<code>\twemoji{paw prints}</code>
	<code>\twemoji{chicken}</code>		<code>\twemoji{peacock}</code>
	<code>\twemoji{chipmunk}</code>		<code>\twemoji{penguin}</code>
	<code>\twemoji{cockroach}</code>		<code>\twemoji{pig face}</code>
	<code>\twemoji{cow face}</code>		<code>\twemoji{pig nose}</code>
	<code>\twemoji{cow2}</code>		<code>\twemoji{pig2}</code>
	<code>\twemoji{crab}</code>		<code>\twemoji{polar bear}</code>
	<code>\twemoji{cricket}</code>		<code>\twemoji{poodle}</code>
	<code>\twemoji{crocodile}</code>		<code>\twemoji{rabbit face}</code>
	<code>\twemoji{deer}</code>		<code>\twemoji{rabbit2}</code>
	<code>\twemoji{dodo}</code>		<code>\twemoji{raccoon}</code>
	<code>\twemoji{dog face}</code>		<code>\twemoji{racehorse}</code>
	<code>\twemoji{dog2}</code>		<code>\twemoji{ram}</code>
	<code>\twemoji{dolphin}</code>		<code>\twemoji{rat}</code>
	<code>\twemoji{dragon}</code>		<code>\twemoji{rhinoceros}</code>
	<code>\twemoji{dragon face}</code>		<code>\twemoji{rooster}</code>
	<code>\twemoji{dromedary camel}</code>		<code>\twemoji{sauropod}</code>
	<code>\twemoji{duck}</code>		<code>\twemoji{scorpion}</code>
	<code>\twemoji{eagle}</code>		<code>\twemoji{seal}</code>
	<code>\twemoji{elephant}</code>		<code>\twemoji{service dog}</code>
	<code>\twemoji{fish}</code>		<code>\twemoji{shark}</code>
	<code>\twemoji{flamingo}</code>		<code>\twemoji{sheep}</code>
	<code>\twemoji{fly}</code>		<code>\twemoji{shrimp}</code>
	<code>\twemoji{fox}</code>		<code>\twemoji{skunk}</code>
	<code>\twemoji{frog}</code>		<code>\twemoji{sloth}</code>
	<code>\twemoji{front-facing baby chick}</code>		<code>\twemoji{snail}</code>
	<code>\twemoji{giraffe}</code>		<code>\twemoji{snake}</code>
	<code>\twemoji{goat}</code>		<code>\twemoji{spiral shell}</code>
	<code>\twemoji{gorilla}</code>		<code>\twemoji{spouting whale}</code>

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	<code>\twemoji{guide dog}</code>		<code>\twemoji{squid}</code>
	<code>\twemoji{hamster}</code>		<code>\twemoji{swan}</code>
	<code>\twemoji{hatching chick}</code>		<code>\twemoji{T-Rex}</code>
	<code>\twemoji{hedgehog}</code>		<code>\twemoji{tiger face}</code>
	<code>\twemoji{hippopotamus}</code>		<code>\twemoji{tiger2}</code>
	<code>\twemoji{honeybee}</code>		<code>\twemoji{tropical fish}</code>
	<code>\twemoji{horse face}</code>		<code>\twemoji{turkey}</code>
	<code>\twemoji{kangaroo}</code>		<code>\twemoji{turtle}</code>
	<code>\twemoji{koala}</code>		<code>\twemoji{two-hump camel}</code>
	<code>\twemoji{lady beetle}</code>		<code>\twemoji{unicorn}</code>
	<code>\twemoji{leopard}</code>		<code>\twemoji{water buffalo}</code>
	<code>\twemoji{lion}</code>		<code>\twemoji{whale2}</code>
	<code>\twemoji{lizard}</code>		<code>\twemoji{wolf}</code>
	<code>\twemoji{llama}</code>		<code>\twemoji{worm}</code>
	<code>\twemoji{lobster}</code>		<code>\twemoji{zebra}</code>
	<code>\twemoji{mammoth}</code>		

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

TABLE 574: fontawesome5 Animals































































































	<code>\faBug</code>		<code>\faDove</code>		<code>\faHippo</code>		<code>\faOtter</code>
	<code>\faCat</code>		<code>\faDragon</code>		<code>\faHorse</code>		<code>\faSpider</code>
	<code>\faCrow</code>		<code>\faFish</code>		<code>\faHorseHead</code>		
	<code>\faDog</code>		<code>\faFrog</code>		<code>\faKiwiBird</code>		

TABLE 575: figchild Animals

	<code>\fcAlligator</code>		<code>\fcGiraffeA</code>
	<code>\fcAlligatorA</code>		<code>\fcGiraffeB</code>
	<code>\fcAnt</code>		<code>\fcGiraffes</code>
	<code>\fcAntA</code>		<code>\fcGnat</code>
	<code>\fcAntelope</code>		<code>\fcGoose</code>
	<code>\fcArmadillo</code>		<code>\fcHerring</code>
	<code>\fcBat</code>		<code>\fcHippo</code>
	<code>\fcBear</code>		<code>\fcHorse</code>
	<code>\fcBearA</code>		<code>\fcHorseA</code>
	<code>\fcBearB</code>		<code>\fcHummingbird</code>
	<code>\fcBearC</code>		<code>\fcKittenA</code>
	<code>\fcBearD</code>		<code>\fcKittenB</code>
	<code>\fcBears</code>		<code>\fcKittensA</code>
	<code>\fcBee</code>		<code>\fcKittensB</code>
	<code>\fcBeeA</code>		<code>\fcLadybird</code>
	<code>\fcBird</code>		<code>\fcLadybirdB</code>
	<code>\fcBirdA</code>		<code>\fcLadyBug</code>
	<code>\fcBirdB</code>		<code>\fcLamb</code>
	<code>\fcBirdC</code>		<code>\fcLion</code>
	<code>\fcBirdD</code>		<code>\fcLionA</code>
	<code>\fcBirdE</code>		<code>\fcLittleBirds</code>
	<code>\fcBull</code>		<code>\fcLittleMouse</code>
































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	<code>\fcBunnyA</code>		<code>\fcLocust</code>
	<code>\fcBunnyB</code>		<code>\fcLouvadeus</code>
	<code>\fcBunnyC</code>		<code>\fcMacaw</code>
	<code>\fcBunnyD</code>		<code>\fcMonkey</code>
	<code>\fcBunnyE</code>		<code>\fcMonkeyA</code>
	<code>\fcButterfly</code>		<code>\fcMoonfish</code>
	<code>\fcButterflyA</code>		<code>\fcMoose</code>
	<code>\fcButterflyB</code>		<code>\fcMouse</code>
	<code>\fcButterflyC</code>		<code>\fcMouseA</code>
	<code>\fcCalf</code>		<code>\fcMouseB</code>
	<code>\fcCat</code>		<code>\fcOctopus</code>
	<code>\fcCaterpillar</code>		<code>\fcOctopusA</code>
	<code>\fcCatfish</code>		<code>\fcOrca</code>
	<code>\fcCentipede</code>		<code>\fcOstrich</code>
	<code>\fcChick</code>		<code>\fcOwl</code>
	<code>\fcChicken</code>		<code>\fcOwlA</code>
	<code>\fcChicks</code>		<code>\fcOwlB</code>
	<code>\fcCobrabebe</code>		<code>\fcOx</code>
	<code>\fcCow</code>		<code>\fcPandaBear</code>
	<code>\fcCrabA</code>		<code>\fcParrot</code>
	<code>\fcCrabB</code>		<code>\fcPeacock</code>
	<code>\fcDinosaurA</code>		<code>\fcPenguin</code>
	<code>\fcDinosaurB</code>		<code>\fcPerch</code>



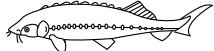








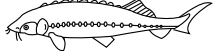












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	<code>\fcDinosaurC</code>		<code>\fcPeruA</code>
	<code>\fcDinosaurD</code>		<code>\fcPeruB</code>
	<code>\fcDinosaurE</code>		<code>\fcPig</code>
	<code>\fcDinosaurF</code>		<code>\fcPigA</code>
	<code>\fcDinosaurG</code>		<code>\fcPigB</code>
	<code>\fcDinosaurH</code>		<code>\fcPigC</code>
	<code>\fcDinosaurI</code>		<code>\fcPigD</code>
	<code>\fcDinosaurJ</code>		<code>\fcPigE</code>
	<code>\fcDog</code>		<code>\fcPuppy</code>
	<code>\fcDolphin</code>		<code>\fcRabbit</code>
	<code>\fcDolphinA</code>		<code>\fcRabbitA</code>
	<code>\fcDragonFly</code>		<code>\fcRabbits</code>
	<code>\fcDuck</code>		<code>\fcRaccoon</code>
	<code>\fcDuckA</code>		<code>\fcScorpion</code>
	<code>\fcDuckB</code>		<code>\fcSeahorse</code>
	<code>\fcDuckC</code>		<code>\fcShark</code>
	<code>\fcElephant</code>		<code>\fcSheep</code>
	<code>\fcElephantA</code>		<code>\fcSheepA</code>
	<code>\fcElephantB</code>		<code>\fcSheepB</code>
	<code>\fcFishA</code>		<code>\fcSheepC</code>
	<code>\fcFishB</code>		<code>\fcSnailA</code>
	<code>\fcFishC</code>		<code>\fcSnailB</code>
	<code>\fcFishD</code>		<code>\fcSnailC</code>

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
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	<code>\fcFishE</code>		<code>\fcSpider</code>
	<code>\fcFishF</code>		<code>\fcSpiderA</code>
	<code>\fcFishG</code>		<code>\fcSpiderB</code>
	<code>\fcFishH</code>		<code>\fcSquirrel</code>
	<code>\fcFishI</code>		<code>\fcSquirrelA</code>
	<code>\fcFishK</code>		<code>\fcSturgeon</code>
	<code>\fcFishL</code>		<code>\fcToucan</code>
	<code>\fcFishM</code>		<code>\fcTurtle</code>
	<code>\fcFlamingo</code>		<code>\fcTurtleA</code>
	<code>\fcFlamingoA</code>		<code>\fcTurtleB</code>
	<code>\fcFrog</code>		<code>\fcUrchin</code>
	<code>\fcGiraffe</code>		<code>\fcZebra</code>

All `figchild` symbols are implemented with `TikZ` graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the `figchild` documentation for more information.



TABLE 579: `bullcntr` Tally Markers

<code>\bullcntr{&lt;1&gt;}</code>		<code>\bullcntr{&lt;4&gt;}</code>		<code>\bullcntr{&lt;7&gt;}</code>
<code>\bullcntr{&lt;2&gt;}</code>		<code>\bullcntr{&lt;5&gt;}</code>		<code>\bullcntr{&lt;8&gt;}</code>
<code>\bullcntr{&lt;3&gt;}</code>		<code>\bullcntr{&lt;6&gt;}</code>		<code>\bullcntr{&lt;9&gt;}</code>

The notation for `\bullcntr` used in the above bears explanation. `\bullcntr` does not take a number as its argument but rather a  $\text{\LaTeX}$  counter, whose value it uses to typeset a tally marker. “`\bullcntr{<3>}`”, for example, means to invoke `\bullcntr` with a counter whose value is 3. (`\bullcntr` usage is therefore akin to that of  $\text{\LaTeX}$ ’s `\fnsymbol`.) The intention is to use `\bullcntr` indirectly via the `bullenum` package’s `bullenum` environment, which is a variation on the `enumerate` environment that uses `\bullcntr` to typeset the labels.




To typeset individual tally markers, one can define a helper command:

```

\newcounter{bull}
\newcommand{\showbullcntr}[1]{%
  \setcounter{bull}{#1}%
  \bullcntr{bull}%
}

```

`bullcntr`’s package options `smallctrbull`, `largectrbull`, and `heartctrbull` and corresponding commands `\smallctrbull`, `\largectrbull`, and `\heartctrbull` control the formatting of each tally marker:























	small	large	heart
<code>\bullcntr{&lt;5&gt;}</code>			

The default is `smartctrbull` (`\smartctrbull`), which maps counter values 1–5 to large pips and 6–9 to small pips. It is also possible to use arbitrary symbols for `\bullcntr`’s pips. See the `bullcntr` documentation for more information.

TABLE 580: `dozenal` Tally Markers

<code>\tally{1}</code>	<code>\tally{3}</code>	<code>\tally{5}</code>
<code>\tally{2}</code>	<code>\tally{4}</code>	<code>\tally{6}</code>

TABLE 581: figchild Letters and Digits

	<code>\fcLetterK</code>		<code>\fcLetterT</code>		<code>\fcNumberThree</code>
	<code>\fcLetterL</code>		<code>\fcLetterU</code>		<code>\fcNumberFour</code>
	<code>\fcLetterM</code>		<code>\fcLetterV</code>		<code>\fcNumberFive</code>
	<code>\fcLetterN</code>		<code>\fcLetterW</code>		<code>\fcNumberSix</code>
	<code>\fcLetterO</code>		<code>\fcLetterX</code>		<code>\fcNumberSeven</code>
	<code>\fcLetterP</code>		<code>\fcLetterY</code>		<code>\fcNumberEight</code>
	<code>\fcLetterQ</code>		<code>\fcLetterZ</code>		<code>\fcNumberNine</code>
	<code>\fcLetterR</code>		<code>\fcNumberOne</code>		<code>\fcNumberTen</code>
	<code>\fcLetterS</code>		<code>\fcNumberTwo</code>		

It's a mystery why figchild's alphabet begins with "K".

All figchild symbols are implemented with *TikZ* graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

TABLE 582: skull Symbols


 `\skull`

TABLE 583: Non-Mathematical mathabx Symbols

$\dagger$  `\rip`

TABLE 584: Miscellaneous ifsym Symbols










	<code>\FilledSectioningDiamond</code>		<code>\Letter</code>		<code>\Radiation</code>
	<code>\Fire</code>		<code>\PaperLandscape</code>		<code>\SectioningDiamond</code>
	<code>\Irritant</code>		<code>\PaperPortrait</code>		<code>\Telephone</code>



TABLE 585: asapsym Signs

Ⓢ	<code>\asapCigaretteSign</code>	Ⓣ	<code>\asapNotEmergencySign</code>
Ⓞ	<code>\asapDogSign</code>	Ⓤ	<code>\asapNotHelpSign</code>
Ⓟ	<code>\asapDollarSign</code>	Ⓧ	<code>\asapNotHospitalSign</code>
Ⓠ	<code>\asapEmergencySign</code>	Ⓨ	<code>\asapNotInformationSign</code>
Ⓡ	<code>\asapHelpSign</code>	Ⓩ	<code>\asapNotMobilePhoneSign</code>
Ⓢ	<code>\asapHospitalSign</code>	ⓐ	<code>\asapNotParkingSign</code>
Ⓣ	<code>\asapInformationSign</code>	ⓑ	<code>\asapNotSign</code>
Ⓤ	<code>\asapMobilePhoneSign</code>	ⓓ	<code>\asapNotWalkSign</code>
Ⓧ	<code>\asapNotCigaretteSign</code>	ⓔ	<code>\asapParkingSign</code>
Ⓨ	<code>\asapNotDogSign</code>	ⓕ	<code>\asapWalkSign</code>
Ⓩ	<code>\asapNotDollarSign</code>		

asapsym requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 586: metre Metrical Symbols

x	<code>\a</code>	Ⓢ	<code>\bBm</code>		<code>\cc</code>	Ⓣ	<code>\Mbb</code>	⋮	<code>\Pppp</code>	⊗	<code>\t</code>
Ⓢ	<code>\B</code>	Ⓤ	<code>\bbm</code>		<code>\Ccc</code>	Ⓤ	<code>\mbbx</code>	⋮	<code>\pppp</code>	┌	<code>\tsbm</code>
Ⓢ	<code>\b</code>	Ⓢ	<code>\Bbm</code>	—	<code>\m</code>	∞	<code>\oo</code>	⋮	<code>\Ppppp</code>	┌	<code>\tsmb</code>
Ⓢ	<code>\Bb</code>	Ⓢ	<code>\bbmb</code>	∠	<code>\M</code>	.	<code>\p</code>	⋮	<code>\ppppp</code>	┌	<code>\tsmm</code>
Ⓢ	<code>\BB</code>	Ⓢ	<code>\bbmx</code>	⋈	<code>\ma</code>	⋈	<code>\pm</code>	┌	<code>\ps</code>	⋮	<code>\vpppm</code>
Ⓢ	<code>\bb</code>	Ⓢ	<code>\bm</code>	Ⓣ	<code>\Mb</code>	:	<code>\pp</code>	:	<code>\pxp</code>	⋮	<code>\vppppm</code>
Ⓢ	<code>\bB</code>	Ⓢ	<code>\Bm</code>	Ⓣ	<code>\mb</code>	:	<code>\Pp</code>	:	<code>\Pxp</code>	::	<code>\x</code>
Ⓢ	<code>\bba</code>		<code>\c</code>	Ⓣ	<code>\mBb</code>	..	<code>\ppm</code>	~	<code>\R</code>		
Ⓢ	<code>\bbb</code>		<code>\C</code>	Ⓢ	<code>\mbB</code>	⋮	<code>\ppp</code>	~	<code>\r</code>		
Ⓢ	<code>\BBm</code>		<code>\Cc</code>	Ⓢ	<code>\mbb</code>	⋮	<code>\Ppp</code>	⊗	<code>\T</code>		

The preceding symbols are valid only within the argument to the `\metre` command.

TABLE 587: metre Small and Large Metrical Symbols

+	<code>\anaclasis</code>	÷	<code>\Anaclasis</code>
<	<code>\antidiple</code>	<	<code>\Antidiple</code>
⋈	<code>\antidiple*</code>	⋈	<code>\Antidiple*</code>
∩	<code>\antisigma</code>	∩	<code>\Antisigma</code>
⋈	<code>\asteriscus</code>	⋈	<code>\Asteriscus</code>
^	<code>\catalexis</code>	^	<code>\Catalexis</code>
>	<code>\diple</code>	>	<code>\Diple</code>
⋈	<code>\diple*</code>	⋈	<code>\Diple*</code>
—	<code>\obelus</code>	—	<code>\Obelus</code>
÷	<code>\obelus*</code>	÷	<code>\Obelus*</code>
~	<code>\respondens</code>	~	<code>\Respondens</code>
⊗	<code>\terminus</code>	⊗	<code>\Terminus</code>
⊕	<code>\terminus*</code>	⊕	<code>\Terminus*</code>

TABLE 588: teubner Metrical Symbols

∞	<code>\aeolicbii</code>	∩	<code>\barbrevis</code>	+	<code>\ipercatal</code>
∞∞	<code>\aeolicbiii</code>	∪	<code>\bbrevis</code>	—	<code>\longa</code>
∞∞∞	<code>\aeolicbiv</code>	∩	<code>\brevis</code>	⌞	<code>\ubarbbrevis</code>
×	<code>\anceps</code>	^	<code>\catal</code>	⌞	<code>\ubarbrevis</code>
×	<code>\ancepsdbrevis</code>	∩	<code>\corona</code>	⌞	<code>\ubarsbrevis</code>
×	<code>\anceps</code>	∩	<code>\coronainv</code>	∩	<code>\ubrevislonga</code>
∩	<code>\barbbrevis</code>	H	<code>\hiatus</code>		

The `teubner` package provides a `\newmetrics` command that helps users combine the preceding symbols as well as other `teubner` symbols. For example, the predefined `\pentam` symbol uses `\newmetrics` to juxtapose six `\longa`s, two `\barbbrevis`s, four `\brevis`s, and a `\dBar` into “`—∩—∩—||—∩—∩—`”. See the `teubner` documentation for more information.

TABLE 589: hamnosys Hand Shapes

∩	<code>\hamceeall</code>	∩	<code>\hamfingertwothree</code>	∩	<code>\hamflathand</code>
∩	<code>\hamceeonetwo</code>	∩	<code>\hamfingertwothreefourfive</code>	∩	<code>\hampinchall</code>
∩	<code>\hamceeopen</code>	∩	<code>\hamfingertwothreespread</code>	∩	<code>\hampinchonetwo</code>
∩	<code>\hamfingertwo</code>	∩	<code>\hamfist</code>	∩	<code>\hampinchonetwoopen</code>

`hamnosys` requires either `LuaATEX` or `XYLATEX`.

TABLE 590: hamnosys Hand-Shape Modifiers

^	<code>\hamdoublebent</code>	∩	<code>\hamfingerhookmod</code>	∩	<code>\hamthumbopenmod</code>
∩	<code>\hamdoublehooked</code>	∩	<code>\hamfingerstraightmod</code>	∩	<code>\hamthumboutmod</code>
∩	<code>\hamfingerbendmod</code>	∩	<code>\hamthumbacrossmod</code>		

`hamnosys` requires either `LuaATEX` or `XYLATEX`.

TABLE 591: hamnosys Extended Finger Directions

∩	<code>\hamextfingerd</code>	∩	<code>\hamextfingeril</code>	∩	<code>\hamextfingerr</code>
∩	<code>\hamextfingerdi</code>	∩	<code>\hamextfingerir</code>	∩	<code>\hamextfingeru</code>
∩	<code>\hamextfingerdl</code>	∩	<code>\hamextfingerl</code>	∩	<code>\hamextfingerui</code>
∩	<code>\hamextfingerdo</code>	∩	<code>\hamextfingero</code>	∩	<code>\hamextfingerul</code>
∩	<code>\hamextfingerdr</code>	∩	<code>\hamextfingerol</code>	∩	<code>\hamextfingeruo</code>
∩	<code>\hamextfingeri</code>	∩	<code>\hamextfingeror</code>	∩	<code>\hamextfingerur</code>

`hamnosys` requires either `LuaATEX` or `XYLATEX`.

TABLE 592: hamnosys Palm Orientations

◌	\hampalmd	◌	\hampalmdr	◌	\hampalml	◌	\hampalml	◌	\hampalml	◌	\hampalml
◌	\hampalmdl	◌	\hampalml	◌	\hampalml	◌	\hampalml	◌	\hampalml	◌	\hampalml

hamnosys requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 593: hamnosys Body Locations

☐	\hambelowstomach	⦿	\hamfingertip	5	\hampinkyside
⌋	\hamcheek	⌋	\hamforehead	4	\hamringfinger
☐	\hamchest	⌋	\hamhandback	☐	\hamshoulders
⌋	\hamchin	○	\hamhead	☐	\hamshouldertop
?	\hamear	○	\hamheadtop	☐	\hamstomach
2	\hamearlobe	2	\hamindexfinger	☐	\hamteeth
⌋	\hamelbow	☐	\hamlips	1	\hamthumb
⌋	\hamelbowinside	⌋	\hamlowerarm	⌋	\hamthumbball
~	\hameyebrows	3	\hammiddlefinger	⌋	\hamthumbside
∞	\hameyes	⌋	\hamneck	☐	\hamtongue
⦿	\hamfingerbase	∅	\hamneutralspace	⌋	\hamunderchin
⦿	\hamfingermidjoint	⌋	\hamnose	⌋	\hamupperarm
⦿	\hamfingernail	⌋	\hamnostrils	⌋	\hamwristback
⦿	\hamfingerpad	~	\hampalm	⌋	\hamwristpulse
⦿	\hamfingerside	5	\hampinky		

hamnosys requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 594: hamnosys Location Modifiers

○	\hamcorefref	□	\hamcoreftag	▪	\hamlrat	◦	\hamlrbeside
---	--------------	---	--------------	---	----------	---	--------------

hamnosys requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 595: hamnosys Movements

∩	<code>\hamarc</code>	○	<code>\hamclockdl</code>	↙	<code>\hammoveil</code>
∪	<code>\hamarcl</code>	◊	<code>\hamclockdr</code>	↘	<code>\hammoveir</code>
∩∪	<code>\hamarcr</code>	⊕	<code>\hamclockfull</code>	←	<code>\hammoveel</code>
∩	<code>\hamarcu</code>	◊	<code>\hamclockl</code>	⊥	<code>\hammoveeo</code>
↗	<code>\hamarmextended</code>	◊	<code>\hamclockr</code>	↖	<code>\hammoveol</code>
↖	<code>\hambehind</code>	◊	<code>\hamclocku</code>	↗	<code>\hammoveor</code>
†	<code>\hambrushing</code>	◊	<code>\hamclockul</code>	→	<code>\hammoveer</code>
⊙	<code>\hamcircled</code>	◊	<code>\hamclockur</code>	↑	<code>\hammoveeu</code>
⊖	<code>\hamcircledi</code>	⊗	<code>\hamclose</code>	↖	<code>\hammoveui</code>
⊖	<code>\hamcircledl</code>	×	<code>\hamcross</code>	↙	<code>\hammoveul</code>
⊖	<code>\hamcircledo</code>	∠	<code>\hamdecreasing</code>	↘	<code>\hammoveuo</code>
⊖	<code>\hamcircledr</code>	⊙	<code>\hamellipseh</code>	↗	<code>\hammoveur</code>
⊖	<code>\hamcirclei</code>	⊙	<code>\hamellipseul</code>	↔	<code>\hamnodding</code>
⊖	<code>\hamcircleil</code>	⊙	<code>\hamellipseur</code>	⊗	<code>\hamnomotion</code>
⊖	<code>\hamcircleir</code>	⊙	<code>\hamellipsev</code>	↗	<code>\hamreplace</code>
⊖	<code>\hamcirclel</code>	*	<code>\hamfast</code>	∇	<code>\hamrest</code>
⊖	<code>\hamcircleo</code>	✎	<code>\hamfingerplay</code>	—	<code>\hamslow</code>
⊖	<code>\hamcircleol</code>		<code>\hamhalt</code>	?	<code>\hamstirccw</code>
⊖	<code>\hamcircleor</code>	∠	<code>\hamincreasing</code>	∇	<code>\hamstircw</code>
⊖	<code>\hamcircler</code>	⊖	<code>\haminterlock</code>	↔	<code>\hamswinging</code>
⊖	<code>\hamcircleu</code>	↓	<code>\hammoved</code>	×	<code>\hamtense</code>
⊖	<code>\hamcircleui</code>	↖	<code>\hammovedi</code>	×	<code>\hamtouch</code>
⊖	<code>\hamcircleul</code>	↙	<code>\hammovedl</code>	∇	<code>\hamtwisting</code>
⊖	<code>\hamcircleuo</code>	↘	<code>\hammovedo</code>	∞	<code>\hamwavy</code>
⊖	<code>\hamcircleur</code>	↗	<code>\hammovedr</code>	∞	<code>\hamzigzag</code>
○	<code>\hamclockd</code>	⊥	<code>\hammovei</code>		

hamnosys requires either Lua<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 596: hamnosys Movement Modifiers

. `\hamlargemod`    ◦ `\hamsmallmod`

hamnosys requires either Lua<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 597: hamnosys Obsolete Spacing Symbols

‡	<code>\hammovecross</code>	↔	<code>\hamwristtoback</code>	↗	<code>\hamwristtopulse</code>
✖	<code>\hammoveX</code>	†	<code>\hamwristtopinky</code>	†	<code>\hamwristtothumb</code>

hamnosys requires either Lua<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 598: Miscellaneous hamnosys Symbols
















































$\sim$	<code>\hamalternatingmotion</code>	$\simeq$	<code>\hamplus</code>
$\backslash$	<code>\hambetween</code>	$\leftrightarrow$	<code>\hamrepeatcontinue</code>
$\dots$	<code>\hametc</code>	$\leftrightarrow$	<code>\hamrepeatcontinueseveral</code>
$\langle$	<code>\hamfusionbegin</code>	$+$	<code>\hamrepeatfromstart</code>
$\rangle$	<code>\hamfusionend</code>	$+$	<code>\hamrepeatfromstartseveral</code>
$\square$	<code>\hammime</code>	$\leftarrow$	<code>\hamrepeatreverse</code>
$\boxtimes$	<code>\hamnondominant</code>	$($	<code>\hamseqbegin</code>
$\textcircled{\times}$	<code>\hamnonipsi</code>	$)$	<code>\hamseqend</code>
$\sim$	<code>\hamorirelative</code>	$\sim$	<code>\hamsymmlr</code>
$[$	<code>\hamparbegin</code>	$:$	<code>\hamsymmpar</code>
$]$	<code>\hamparend</code>		

hamnosys requires either  $\text{Lua}\text{L}\text{A}\text{T}\text{E}\text{X}$  or  $\text{X}\text{E}\text{L}\text{A}\text{T}\text{E}\text{X}$ .

TABLE 599: dictsym Dictionary Symbols

$\textcircled{\times}$	<code>\dsaeronautical</code>	$\textcircled{\times}$	<code>\dscommercial</code>	$\textcircled{\times}$	<code>\dsmedical</code>
$\textcircled{\times}$	<code>\dsagricultural</code>	$\textcircled{\times}$	<code>\ds heraldical</code>	$\textcircled{\times}$	<code>\dsmilitary</code>
$\textcircled{\times}$	<code>\dsarchitectural</code>	$\textcircled{\times}$	<code>\dsjuridical</code>	$\textcircled{\times}$	<code>\dsrailways</code>
$\textcircled{\times}$	<code>\dsbiological</code>	$\textcircled{\times}$	<code>\dsliterary</code>	$\textcircled{\times}$	<code>\ds technical</code>
$\textcircled{\times}$	<code>\dschemical</code>	$\textcircled{\times}$	<code>\ds mathematical</code>		






















TABLE 600: pmboxdraw Box-Drawing Symbols

	<code>\textblock</code>		<code>\textSFli</code>		<code>\textSFxli</code>		<code>\textSFxxiii</code>
	<code>\textdkshade</code>		<code>\textSFlii</code>		<code>\textSFxlii</code>		<code>\textSFxxiv</code>
	<code>\textdnblock</code>		<code>\textSFliiii</code>	<code>=</code>	<code>\textSFxliiii</code>		<code>\textSFxxv</code>
	<code>\textlfblock</code>		<code>\textSFliv</code>		<code>\textSFxliv</code>		<code>\textSFxxvi</code>
	<code>\textltshade</code>		<code>\textSFv</code>		<code>\textSFxlix</code>		<code>\textSFxxvii</code>
	<code>\textrtblock</code>		<code>\textSFvi</code>		<code>\textSFxlv</code>		<code>\textSFxxviii</code>
	<code>\textSFi</code>		<code>\textSFvii</code>		<code>\textSFxlvii</code>		<code>\textSFxxxix</code>
	<code>\textSFii</code>		<code>\textSFviii</code>		<code>\textSFxlvi</code>		<code>\textSFxxxvi</code>
	<code>\textSFiii</code>		<code>\textSFx</code>		<code>\textSFxlviiii</code>		<code>\textSFxxxvii</code>
	<code>\textSFiv</code>		<code>\textSFxi</code>		<code>\textSFxx</code>		<code>\textSFxxxviii</code>
	<code>\textSFix</code>		<code>\textSFxix</code>		<code>\textSFxxi</code>		<code>\textshade</code>
	<code>\textSF1</code>		<code>\textSFx1</code>		<code>\textSFxxii</code>		<code>\textupblock</code>

Code Page 437 (CP437), which was first utilized by the original IBM PC, contains the set of box-drawing symbols (sides, corners, and intersections of single- and double-ruled boxes) shown above in character positions 176–223. These symbols also appear in the Unicode Box Drawing and Block Element tables.
















































The `pmboxdraw` package draws the CP437 box-drawing symbols using `TeX` rules (specifically, `\vrule`) instead of with a font and thereby provides the ability to alter both rule width and the separation between rules. See the `pmboxdraw` documentation for more information.

TABLE 601: staves Magical Staves

	<code>\staveI</code>		<code>\staveXXIV</code>		<code>\staveXLVII</code>
	<code>\staveII</code>		<code>\staveXXV</code>		<code>\staveXLVIII</code>
	<code>\staveIII</code>		<code>\staveXXVI</code>		<code>\staveXLIX</code>
	<code>\staveIV</code>		<code>\staveXXVII</code>		<code>\staveL</code>
	<code>\staveV</code>		<code>\staveXXVIII</code>		<code>\staveLI</code>
	<code>\staveVI</code>		<code>\staveXXIX</code>		<code>\staveLII</code>
	<code>\staveVII</code>		<code>\staveXXX</code>		<code>\staveLIII</code>

(continued on next page)

*(continued from previous page)*

	<code>\staveVIII</code>		<code>\staveXXXI</code>		<code>\staveLIV</code>
	<code>\staveIX</code>		<code>\staveXXXII</code>		<code>\staveLV</code>
	<code>\staveX</code>		<code>\staveXXXIII</code>		<code>\staveLVI</code>
	<code>\staveXI</code>		<code>\staveXXXIV</code>		<code>\staveLVII</code>
	<code>\staveXII</code>		<code>\staveXXXV</code>		<code>\staveLVIII</code>
	<code>\staveXIII</code>		<code>\staveXXXVI</code>		<code>\staveLIX</code>
	<code>\staveXIV</code>		<code>\staveXXXVII</code>		<code>\staveLX</code>
	<code>\staveXV</code>		<code>\staveXXXVIII</code>		<code>\staveLXI</code>
	<code>\staveXVI</code>		<code>\staveXXXIX</code>		<code>\staveLXII</code>
	<code>\staveXVII</code>		<code>\staveXL</code>		<code>\staveLXIII</code>
	<code>\staveXVIII</code>		<code>\staveXLI</code>		<code>\staveLXIV</code>
	<code>\staveXIX</code>		<code>\staveXLII</code>		<code>\staveLXV</code>
	<code>\staveXX</code>		<code>\staveXLIII</code>		<code>\staveLXVI</code>
	<code>\staveXXI</code>		<code>\staveXLIV</code>		<code>\staveLXVII</code>
	<code>\staveXXII</code>		<code>\staveXLV</code>		<code>\staveLXVIII</code>
	<code>\staveXXIII</code>		<code>\staveXLVI</code>		


The meanings of these symbols are described on the Web site for the Museum of Icelandic Sorcery and Witchcraft at [http://www.galdrasynning.is/index.php?option=com\\_content&task=category&sectionid=5&id=18&Itemid=60](http://www.galdrasynning.is/index.php?option=com_content&task=category&sectionid=5&id=18&Itemid=60) (TinyURL: <http://tinyurl.com/25979m>). For example, `\staveL` (“”) is intended to ward off ghosts and evil spirits.

TABLE 602: pigpen Cipher Symbols

┘	{\pigpenfont A}	┐	{\pigpenfont J}	∨	{\pigpenfont S}
└	{\pigpenfont B}	┌	{\pigpenfont K}	>	{\pigpenfont T}
┐	{\pigpenfont C}	└	{\pigpenfont L}	<	{\pigpenfont U}
┘	{\pigpenfont D}	┘	{\pigpenfont M}	^	{\pigpenfont V}
└	{\pigpenfont E}	└	{\pigpenfont N}	∨	{\pigpenfont W}
┘	{\pigpenfont F}	┘	{\pigpenfont O}	>	{\pigpenfont X}
┐	{\pigpenfont G}	┐	{\pigpenfont P}	<	{\pigpenfont Y}
└	{\pigpenfont H}	└	{\pigpenfont Q}	^	{\pigpenfont Z}
┘	{\pigpenfont I}	┘	{\pigpenfont R}		

TABLE 603: GnA2e Phases of the Moon

☾	\MoonPha{1}	☽	\MoonPha{2}	☽	\MoonPha{3}	☾	\MoonPha{4}
---	-------------	---	-------------	---	-------------	---	-------------

TABLE 604: twemojis Phases of the Moon


























🌙	\twemoji{crescent moon}	🌑	\twemoji{new moon}
🌖	\twemoji{first quarter moon}	🌑	\twemoji{new moon face}
🌗	\twemoji{first quarter moon face}	🌘	\twemoji{waning crescent moon}
🌕	\twemoji{full moon}	🌗	\twemoji{waning gibbous moon}
🌕	\twemoji{full moon face}	🌙	\twemoji{waxing crescent moon}
🌘	\twemoji{last quarter moon}	🌖	\twemoji{waxing gibbous moon}
🌗	\twemoji{last quarter moon face}		

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .



TABLE 605: figchild Space Symbols

	<code>\fcET</code>		<code>\fcPlanetF</code>		<code>\fcShootingStar</code>
	<code>\fcFlyingSaucer</code>		<code>\fcPlanetG</code>		<code>\fcSpacecraftA</code>
	<code>\fcMoonA</code>		<code>\fcPlanets</code>		<code>\fcSpacecraftB</code>
	<code>\fcMoonB</code>		<code>\fcRocket</code>		<code>\fcStar</code>
	<code>\fcPlanetA</code>		<code>\fcRocketA</code>		<code>\fcStarA</code>
	<code>\fcPlanetB</code>		<code>\fcRocketB</code>		<code>\fcStarB</code>
	<code>\fcPlanetC</code>		<code>\fcRocketC</code>		<code>\fcStars</code>
	<code>\fcPlanetD</code>		<code>\fcSaturnA</code>		
	<code>\fcPlanetE</code>		<code>\fcSaturnB</code>		

All figchild symbols are implemented with TikZ graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

TABLE 606: GpA2e Recycling Symbols


 `\Greenpoint`

TABLE 607: marvosym Recycling Symbols



 `\PackingWaste`  `\Recycling`

TABLE 608: utfsym Recycling Symbols

	<code>\usym{2672}</code>		<code>\usym{2676}</code>		<code>\usym{267A}</code>		<code>\usym{267E}</code>
	<code>\usym{2673}</code>		<code>\usym{2677}</code>		<code>\usym{267B}</code>		
	<code>\usym{2674}</code>		<code>\usym{2678}</code>		<code>\usym{267C}</code>		
	<code>\usym{2675}</code>		<code>\usym{2679}</code>		<code>\usym{267D}</code>		

All utfsym symbols are implemented with TikZ graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the utfsym documentation for more information.

TABLE 609: fontawesome5 Recycling Symbols



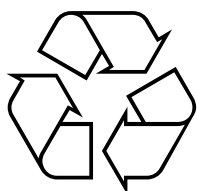
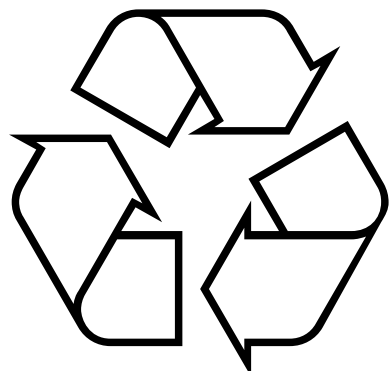
 `\faRecycle`

TABLE 610: recycle Recycling Symbols

 `\recycle`
 `\Recycle`
  
 `\RECYCLE`

The METAFONT code that implements the recycling symbols shown above is, in the words of its author, “awful code [that] doesn’t even put the logo in a box (properly)”. Expect to receive “**Inconsistent equation (off by  $\langle number \rangle$ )**” errors from METAFONT. Fortunately, if you tell METAFONT to proceed past those errors (e.g., by pressing Enter after each one or by specifying “`-interaction=nonstopmode`” on the METAFONT command line) it should produce a valid font.



















The commands listed above should be used within a group (e.g., “`{\recycle}`”) because they exhibit the side effect of *changing* the font to the recycle font.

TABLE 611: utfsym Plants and Flowers

	<code>\usym{1F331}</code>		<code>\usym{1F337}</code>		<code>\usym{1F33C}</code>		<code>\usym{1F341}</code>
	<code>\usym{1F332}</code>		<code>\usym{1F338}</code>		<code>\usym{1F33D}</code>		<code>\usym{1F342}</code>
	<code>\usym{1F333}</code>		<code>\usym{1F339}</code>		<code>\usym{1F33E}</code>		<code>\usym{1F343}</code>
	<code>\usym{1F334}</code>		<code>\usym{1F33A}</code>		<code>\usym{1F33F}</code>		<code>\usym{1F3F5}</code>
	<code>\usym{1F335}</code>		<code>\usym{1F33B}</code>		<code>\usym{1F340}</code>		<code>\usym{1F3F6}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 612: utfsym Clothing

	<code>\usym{1F451}</code>		<code>\usym{1F456}</code>		<code>\usym{1F45B}</code>		<code>\usym{1F460}</code>
	<code>\usym{1F452}</code>		<code>\usym{1F457}</code>		<code>\usym{1F45C}</code>		<code>\usym{1F461}</code>
	<code>\usym{1F453}</code>		<code>\usym{1F458}</code>		<code>\usym{1F45D}</code>		<code>\usym{1F462}</code>
	<code>\usym{1F454}</code>		<code>\usym{1F459}</code>		<code>\usym{1F45E}</code>		
	<code>\usym{1F455}</code>		<code>\usym{1F45A}</code>		<code>\usym{1F45F}</code>		

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 613: Miscellaneous G<sub>A</sub>2e Symbols

	<code>\Info</code>		<code>\Request</code>
	<code>\Postbox</code>		<code>\Telephone</code>

TABLE 614: soyombo Soyombo Symbols

	<code>\Soyombo</code>		<code>\sA*</code>		<code>\sO*</code>
---	-----------------------	---	-------------------	---	-------------------

\* These symbols require that the Soyombo font be active (“`{\soyombo ... }`”).

TABLE 615: knitting Knitting Symbols

$\wedge$	<code>\textkmit{!}</code>	$\rightarrow$	<code>\textkmit{[]}</code>	$\mathcal{Q}$	<code>\textkmit{Q}</code>
$\mathcal{G}$	<code>\textkmit{"}</code>	$\leftarrow$	<code>\textkmit{]}</code>	$\mathcal{Q}$	<code>\textkmit{q}</code>
$\setminus$	<code>\textkmit{(}</code>	$\wedge$	<code>\textkmit{A}</code>	$\mathcal{R}$	<code>\textkmit{R}</code>
$/$	<code>\textkmit{)}</code>	$\uparrow$	<code>\textkmit{a}</code>	$\mathcal{R}$	<code>\textkmit{r}</code>
$*$	<code>\textkmit{*}</code>	$\mathcal{B}$	<code>\textkmit{B}</code>	$\leftarrow$	<code>\textkmit{S}</code>
$ $	<code>\textkmit{-}</code>	$\mathcal{B}$	<code>\textkmit{b}</code>	$\rightarrow$	<code>\textkmit{s}</code>
$\wedge$	<code>\textkmit{2}</code>	$\mathcal{E}$	<code>\textkmit{E}</code>	$\mathcal{Q}$	<code>\textkmit{T}</code>
$\wedge$	<code>\textkmit{3}</code>	$\mathcal{F}$	<code>\textkmit{F}</code>	$\mathcal{Q}$	<code>\textkmit{t}</code>
$\wedge$	<code>\textkmit{4}</code>	$\mathcal{F}$	<code>\textkmit{f}</code>	$\mathcal{Q}$	<code>\textkmit{U}</code>
$\wedge$	<code>\textkmit{5}</code>	$\uparrow$	<code>\textkmit{H}</code>	$\mathcal{U}$	<code>\textkmit{u}</code>
$\mathcal{V}$	<code>\textkmit{6}</code>	$\downarrow$	<code>\textkmit{h}</code>	$\mathcal{V}$	<code>\textkmit{V}</code>
$\mathcal{V}$	<code>\textkmit{7}</code>	$\mathcal{I}$	<code>\textkmit{I}</code>	$\mathcal{V}$	<code>\textkmit{v}</code>
$\mathcal{V}$	<code>\textkmit{8}</code>	$\mathcal{I}$	<code>\textkmit{i}</code>	$\mathcal{V}$	<code>\textkmit{W}</code>
$\mathcal{Q}$	<code>\textkmit{9}</code>	$\mathcal{J}$	<code>\textkmit{J}</code>	$\mathcal{V}$	<code>\textkmit{w}</code>
$\mathcal{A}$	<code>\textkmit{:}</code>	$\mathcal{J}$	<code>\textkmit{j}</code>	$\mathcal{Q}$	<code>\textkmit{X}</code>
$\mathcal{N}$	<code>\textkmit{;}</code>	$\mathcal{L}$	<code>\textkmit{L}</code>	$\mathcal{Q}$	<code>\textkmit{x}</code>
$\mathcal{N}$	<code>\textkmit{&lt;}</code>	$\mathcal{L}$	<code>\textkmit{l}</code>	$\mathcal{Y}$	<code>\textkmit{Y}</code>
$\mathcal{M}$	<code>\textkmit{=}</code>	$\mathcal{M}$	<code>\textkmit{M}</code>	$\mathcal{Y}$	<code>\textkmit{y}</code>
$\mathcal{A}$	<code>\textkmit{&gt;}</code>	$m$	<code>\textkmit{m}</code>	$\mathcal{Z}$	<code>\textkmit{Z}</code>
$\bullet$	<code>\textkmit{@}</code>	$\mathcal{O}$	<code>\textkmit{O}</code>	$\mathcal{Z}$	<code>\textkmit{z}</code>

The knitting package is intended to typeset complete knitting charts. See the knitting documentation for more information.
















Some symbols behave differently when used as part of a sequence. For example, contrast `\textkmit{1}` (“ $\uparrow$ ”), `\textkmit{11}` (“ $\uparrow\uparrow$ ”), and `\textkmit{111}` (“ $\uparrow\uparrow\uparrow$ ”). Similarly, contrast `\textkmit{"}` (“ $\mathcal{G}$ ”) and `\textkmit{""}` (“ $\mathcal{S}$ ”). Again, see the knitting documentation for more information.

TABLE 616: worldflags Nautical Symbol Flags

	<code>\worldflag{A}</code>		<code>\worldflag{J}</code>		<code>\worldflag{S}</code>		<code>\worldflag{1}</code>
	<code>\worldflag{B}</code>		<code>\worldflag{K}</code>		<code>\worldflag{T}</code>		<code>\worldflag{2}</code>
	<code>\worldflag{C}</code>		<code>\worldflag{L}</code>		<code>\worldflag{U}</code>		<code>\worldflag{3}</code>
	<code>\worldflag{D}</code>		<code>\worldflag{M}</code>		<code>\worldflag{V}</code>		<code>\worldflag{4}</code>
	<code>\worldflag{E}</code>		<code>\worldflag{N}</code>		<code>\worldflag{W}</code>		<code>\worldflag{5}</code>
	<code>\worldflag{F}</code>		<code>\worldflag{O}</code>		<code>\worldflag{X}</code>		<code>\worldflag{6}</code>
	<code>\worldflag{G}</code>		<code>\worldflag{P}</code>		<code>\worldflag{Y}</code>		<code>\worldflag{7}</code>
	<code>\worldflag{H}</code>		<code>\worldflag{Q}</code>		<code>\worldflag{Z}</code>		<code>\worldflag{8}</code>
	<code>\worldflag{I}</code>		<code>\worldflag{R}</code>		<code>\worldflag{0}</code>		<code>\worldflag{9}</code>

All worldflags symbols are implemented with TikZ graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

TABLE 617: Other worldflags Flags

	<code>\worldflag{Buddhism}</code>		<code>\worldflag{NATO}</code>		<code>\worldflag{RedCrystal}</code>
	<code>\worldflag{Christian}</code>		<code>\worldflag{Olympics}</code>		<code>\worldflag{UNESCO}</code>
	<code>\worldflag{Esperanto}</code>		<code>\worldflag{Rainbow}</code>		<code>\worldflag{UNO}</code>
	<code>\worldflag{EU}</code>		<code>\worldflag{RedCrescent}</code>		<code>\worldflag{WB}</code>
	<code>\worldflag{JollyRoger}</code>		<code>\worldflag{RedCross}</code>		<code>\worldflag{WHO}</code>

All worldflags symbols are implemented with TikZ graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

TABLE 618: twemojis Non-National Flags

	<code>\twemoji{pirate flag}</code>		<code>\twemoji{transgender flag}</code>
	<code>\twemoji{rainbow flag}</code>		

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

TABLE 619: fontawesome5 Flags





	<code>\faFlag</code>		<code>\faFlagChecked</code>
	<code>\faFlag[regular]</code>		<code>\faFlagUsa</code>

TABLE 620: Miscellaneous arev Symbols




































































































































	<code>\anchor</code>		<code>\invsmileface</code>		<code>\skull</code>		<code>\warning</code>
	<code>\biohazard</code>		<code>\radiation</code>		<code>\smileface</code>		<code>\yinyang</code>
	<code>\heavyqleft</code>		<code>\recycle</code>		<code>\steaming</code>		
	<code>\heavyqright</code>		<code>\sadface</code>		<code>\swords</code>		

TABLE 621: twemojis Food Emoji

	<code>\twemoji{avocado}</code>		<code>\twemoji{hot beverage}</code>
	<code>\twemoji{bacon}</code>		<code>\twemoji{hot dog}</code>
	<code>\twemoji{bagel}</code>		<code>\twemoji{hot pepper}</code>
	<code>\twemoji{baguette bread}</code>		<code>\twemoji{ice}</code>
	<code>\twemoji{banana}</code>		<code>\twemoji{ice cream}</code>
	<code>\twemoji{beer mug}</code>		<code>\twemoji{kiwi fruit}</code>
	<code>\twemoji{bell pepper}</code>		<code>\twemoji{leafy green}</code>
	<code>\twemoji{bento box}</code>		<code>\twemoji{lemon}</code>
	<code>\twemoji{beverage box}</code>		<code>\twemoji{lollipop}</code>
	<code>\twemoji{blueberries}</code>		<code>\twemoji{mango}</code>
	<code>\twemoji{bottle with popping cork}</code>		<code>\twemoji{mate}</code>
	<code>\twemoji{bowl with spoon}</code>		<code>\twemoji{meat on bone}</code>
	<code>\twemoji{bread}</code>		<code>\twemoji{melon}</code>
	<code>\twemoji{broccoli}</code>		<code>\twemoji{moon cake}</code>
	<code>\twemoji{bubble tea}</code>		<code>\twemoji{mushroom}</code>
	<code>\twemoji{burrito}</code>		<code>\twemoji{oden}</code>
	<code>\twemoji{butter}</code>		<code>\twemoji{olive}</code>
	<code>\twemoji{candy}</code>		<code>\twemoji{onion}</code>
	<code>\twemoji{canned food}</code>		<code>\twemoji{pancakes}</code>
	<code>\twemoji{carrot}</code>		<code>\twemoji{peach}</code>
	<code>\twemoji{cheese wedge}</code>		<code>\twemoji{peanuts}</code>
	<code>\twemoji{cherries}</code>		<code>\twemoji{pear}</code>
	<code>\twemoji{chocolate bar}</code>		<code>\twemoji{pie}</code>
	<code>\twemoji{chopsticks}</code>		<code>\twemoji{pineapple}</code>
	<code>\twemoji{clinking beer mugs}</code>		<code>\twemoji{pizza}</code>
	<code>\twemoji{clinking glasses}</code>		<code>\twemoji{popcorn}</code>

*(continued on next page)*




(continued from previous page)

	<code>\twemoji{cocktail glass}</code>		<code>\twemoji{pot of food}</code>
	<code>\twemoji{coconut}</code>		<code>\twemoji{potato}</code>
	<code>\twemoji{cooked rice}</code>		<code>\twemoji{poultry leg}</code>
	<code>\twemoji{cookie}</code>		<code>\twemoji{pretzel}</code>
	<code>\twemoji{cooking}</code>		<code>\twemoji{red apple}</code>
	<code>\twemoji{croissant}</code>		<code>\twemoji{rice ball}</code>
	<code>\twemoji{cucumber}</code>		<code>\twemoji{rice cracker}</code>
	<code>\twemoji{cup with straw}</code>		<code>\twemoji{roasted sweet potato}</code>
	<code>\twemoji{cupcake}</code>		<code>\twemoji{sake}</code>
	<code>\twemoji{curry rice}</code>		<code>\twemoji{salt}</code>
	<code>\twemoji{custard}</code>		<code>\twemoji{sandwich}</code>
	<code>\twemoji{cut of meat}</code>		<code>\twemoji{shallow pan of food}</code>
	<code>\twemoji{dango}</code>		<code>\twemoji{shaved ice}</code>
	<code>\twemoji{doughnut}</code>		<code>\twemoji{shortcake}</code>
	<code>\twemoji{dumpling}</code>		<code>\twemoji{soft ice cream}</code>
	<code>\twemoji{egg}</code>		<code>\twemoji{spaghetti}</code>
	<code>\twemoji{eggplant}</code>		<code>\twemoji{steaming bowl}</code>
	<code>\twemoji{falafel}</code>		<code>\twemoji{strawberry}</code>
	<code>\twemoji{fish cake with swirl}</code>		<code>\twemoji{stuffed flatbread}</code>
	<code>\twemoji{flatbread}</code>		<code>\twemoji{sushi}</code>
	<code>\twemoji{fondue}</code>		<code>\twemoji{taco}</code>
	<code>\twemoji{fork and knife}</code>		<code>\twemoji{takeout box}</code>
	<code>\twemoji{fork and knife with plate}</code>		<code>\twemoji{tamale}</code>
	<code>\twemoji{fortune cookie}</code>		<code>\twemoji{tangerine}</code>
	<code>\twemoji{french fries}</code>		<code>\twemoji{teacup without handle}</code>
	<code>\twemoji{fried shrimp}</code>		<code>\twemoji{teapot}</code>
	<code>\twemoji{garlic}</code>		<code>\twemoji{tomato}</code>
	<code>\twemoji{glass of milk}</code>		<code>\twemoji{tropical drink}</code>
	<code>\twemoji{grapes}</code>		<code>\twemoji{tumbler glass}</code>
	<code>\twemoji{green apple}</code>		<code>\twemoji{waffle}</code>
	<code>\twemoji{green salad}</code>		<code>\twemoji{watermelon}</code>
	<code>\twemoji{hamburger}</code>		<code>\twemoji{wine glass}</code>
	<code>\twemoji{honey pot}</code>		

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

TABLE 622: figchild Food and Cooking Symbols

	<code>\fcApple</code>		<code>\fcFrenchFries</code>		<code>\fcPimento</code>
	<code>\fcBarbecue</code>		<code>\fcFridge</code>		<code>\fcPineapple</code>
	<code>\fcBread</code>		<code>\fchamburger</code>		<code>\fcPopsicle</code>
	<code>\fcBrownie</code>		<code>\fcIceCreamA</code>		<code>\fcPotato</code>
	<code>\fcBullet</code>		<code>\fcIceCreamB</code>		<code>\fcPulse</code>
	<code>\fcBurrito</code>		<code>\fcIceCreamC</code>		<code>\fcRoastChicken</code>
	<code>\fcCabbage</code>		<code>\fcIceCreamD</code>		<code>\fcRoller</code>
	<code>\fcCarrot</code>		<code>\fcIceCreamE</code>		<code>\fcScallion</code>
	<code>\fcCarrotA</code>		<code>\fcIceCreamF</code>		<code>\fcScaredEgg</code>
	<code>\fcCashier</code>		<code>\fcIceCreamG</code>		<code>\fcSharpKnife</code>
	<code>\fcCheese</code>		<code>\fcIceCreamH</code>		<code>\fcShell</code>
	<code>\fcCherry</code>		<code>\fcKetchup</code>		<code>\fcShrimp</code>
	<code>\fcChickenThigh</code>		<code>\fcKettle</code>		<code>\fcSpatulas</code>
	<code>\fcCucumber</code>		<code>\fcKnife</code>		<code>\fcSteak</code>
	<code>\fcCupcake</code>		<code>\fcMug</code>		<code>\fcStrawberry</code>
	<code>\fcCupcakeA</code>		<code>\fcMushroom</code>		<code>\fcStrawberryA</code>
	<code>\fcCupcakeB</code>		<code>\fcMushroomA</code>		<code>\fcSugar</code>
	<code>\fcCuttingBoard</code>		<code>\fcMushroomB</code>		<code>\fcTomato</code>
	<code>\fcEgg</code>		<code>\fcNuggets</code>		<code>\fcTony</code>
	<code>\fcEggA</code>		<code>\fcOnion</code>		<code>\fcWatermelon</code>
	<code>\fcEggB</code>		<code>\fcPanA</code>		





\fcEggplant



\fcPanB

All figchild symbols are implemented with *TikZ* graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the *figchild* documentation for more information.

TABLE 623: *utfsym* Food and Cooking Symbols


















	<code>\usym{1F32D}</code>		<code>\usym{1F350}</code>		<code>\usym{1F362}</code>		<code>\usym{1F372}</code>
	<code>\usym{1F32E}</code>		<code>\usym{1F351}</code>		<code>\usym{1F363}</code>		<code>\usym{1F373}</code>
	<code>\usym{1F32F}</code>		<code>\usym{1F352}</code>		<code>\usym{1F364}</code>		<code>\usym{1F374}</code>
	<code>\usym{1F336}</code>		<code>\usym{1F353}</code>		<code>\usym{1F365}</code>		<code>\usym{1F375}</code>
	<code>\usym{1F344}</code>		<code>\usym{1F354}</code>		<code>\usym{1F366}</code>		<code>\usym{1F376}</code>
	<code>\usym{1F345}</code>		<code>\usym{1F355}</code>		<code>\usym{1F367}</code>		<code>\usym{1F377}</code>
	<code>\usym{1F346}</code>		<code>\usym{1F356}</code>		<code>\usym{1F368}</code>		<code>\usym{1F378}</code>
	<code>\usym{1F347}</code>		<code>\usym{1F357}</code>		<code>\usym{1F369}</code>		<code>\usym{1F379}</code>
	<code>\usym{1F348}</code>		<code>\usym{1F35A}</code>		<code>\usym{1F36A}</code>		<code>\usym{1F37A}</code>
	<code>\usym{1F349}</code>		<code>\usym{1F35B}</code>		<code>\usym{1F36B}</code>		<code>\usym{1F37B}</code>
	<code>\usym{1F34A}</code>		<code>\usym{1F35C}</code>		<code>\usym{1F36C}</code>		<code>\usym{1F37C}</code>
	<code>\usym{1F34B}</code>		<code>\usym{1F35D}</code>		<code>\usym{1F36D}</code>		<code>\usym{1F37D}</code>
	<code>\usym{1F34C}</code>		<code>\usym{1F35E}</code>		<code>\usym{1F36E}</code>		<code>\usym{1F37E}</code>
	<code>\usym{1F34D}</code>		<code>\usym{1F35F}</code>		<code>\usym{1F36F}</code>		<code>\usym{1F37F}</code>
	<code>\usym{1F34E}</code>		<code>\usym{1F360}</code>		<code>\usym{1F370}</code>		<code>\usym{1F382}</code>
	<code>\usym{1F34F}</code>		<code>\usym{1F361}</code>		<code>\usym{1F371}</code>		

All *utfsym* symbols are implemented with *TikZ* graphics, not with a font. In addition to `\usym`, the *utfsym* package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the *utfsym* documentation for more information.

TABLE 624: *cookingsymbols* Cooking Symbols

	<code>\Bottomheat</code>		<code>\Fork</code>		<code>\Knife</code>		<code>\Topbottomheat</code>
	<code>\Dish</code>		<code>\Gasstove</code>		<code>\Oven</code>		<code>\Topheat</code>
	<code>\Fanoven</code>		<code>\Gloves</code>		<code>\Spoon</code>		

























TABLE 625: tikzsymbols Cooking Symbols

	<code>\bakingplate</code>		<code>\eggbeater</code>		<code>\pan</code>		<code>\squeezer</code>
	<code>\blender</code>		<code>\fryingpan</code>		<code>\peeler</code>		<code>\trident</code>
	<code>\bottle</code>		<code>\garlicpress</code>		<code>\pot</code>		
	<code>\bowl</code>		<code>\grater</code>		<code>\rollingpin</code>		
	<code>\cooker</code>		<code>\oven</code>		<code>\sieve</code>		

`tikzsymbols` defines German-language aliases for each of the above: `\Backblech` for `\bakingplate`, `\Bratpfanne` for `\fryingpan`, `\Dreizack` for `\trident`, `\Flasche` for `\bottle`, `\Herd` for `\cooker`, `\Kochtopf` for `\pot`, `\Knoblauchpresse` for `\garlicpress`, `\Nudelholz` for `\rollingpin`, `\Ofen` for `\oven`, `\Pfanne` for `\pan`, `\Purierstab` for `\blender`, `\Reibe` for `\grater`, `\Saftpresse` for `\squeezer`, `\Schaler` for `\peeler`, `\Schneebesen` for `\eggbeater`, `\Schussel` for `\bowl`, and `\Sieb` for `\sieve`.





















All `tikzsymbols` symbols are implemented with `TikZ` graphics, not with a font.

TABLE 626: tikzsymbols Emoji

	<code>\Annoey</code>		<code>\Laughey</code>		<code>\rWalley</code>		<code>\Tongey</code>
	<code>\Cat</code>		<code>\Neutrey</code>		<code>\Sadey</code>		<code>\Vomey</code>
	<code>\cChangey{1}</code>		<code>\NiceReapey</code>		<code>\SchrodingersCat{0}</code>		<code>\Walley</code>
	<code>\Changey{1}</code>		<code>\Ninja</code>		<code>\Sey</code>		<code>\Winkey</code>
	<code>\Cooley</code>		<code>\Nursey</code>		<code>\Sleepy</code>		<code>\wInnocey</code>
	<code>\Innocey</code>		<code>\oldWinkey</code>		<code>\Smiley</code>		<code>\Xey</code>

All `tikzsymbols` symbols are implemented with `TikZ` graphics, not with a font. Hence, symbols like `\Ninja` can include color. In fact, most of the commands shown above accept one or more color arguments for further customization. Also note that `\cChangey`, `\Changey`, and `\SchrodingersCat` take a mandatory argument. See the `tikzsymbols` documentation for more information.

TABLE 627: tikzsymbols 3D Emoji

	<code>\dAnnoey</code>		<code>\dLaughey</code>		<code>\dSadey</code>		<code>\dVomey</code>
	<code>\dcChangey{1}</code>		<code>\dNeutrey</code>		<code>\dSey</code>		<code>\dWalley</code>
	<code>\dChangey{1}</code>		<code>\dNinja</code>		<code>\dSleepy</code>		<code>\dWinkey</code>
	<code>\dCooley</code>		<code>\dNursey</code>		<code>\dSmiley</code>		<code>\dXey</code>
	<code>\dInnocey</code>		<code>\drWalley</code>		<code>\dTongey</code>		<code>\olddWinkey</code>

All `tikzsymbols` symbols are implemented with `TikZ` graphics, not with a font. Hence, all of the symbols shown above can include color. In fact, each command in Table 627 accepts one or more color arguments for further customization. Note that `\dcChangey` and `\dChangey` also take a mandatory argument. See the `tikzsymbols` documentation for more information.

TABLE 628: utfsym Emoji

	<code>\usym{1F600}</code>		<code>\usym{1F614}</code>		<code>\usym{1F628}</code>		<code>\usym{1F63C}</code>
	<code>\usym{1F601}</code>		<code>\usym{1F615}</code>		<code>\usym{1F629}</code>		<code>\usym{1F63D}</code>
	<code>\usym{1F602}</code>		<code>\usym{1F616}</code>		<code>\usym{1F62A}</code>		<code>\usym{1F63E}</code>
	<code>\usym{1F603}</code>		<code>\usym{1F617}</code>		<code>\usym{1F62B}</code>		<code>\usym{1F63F}</code>
	<code>\usym{1F604}</code>		<code>\usym{1F618}</code>		<code>\usym{1F62C}</code>		<code>\usym{1F640}</code>
	<code>\usym{1F605}</code>		<code>\usym{1F619}</code>		<code>\usym{1F62D}</code>		<code>\usym{1F641}</code>
	<code>\usym{1F606}</code>		<code>\usym{1F61A}</code>		<code>\usym{1F62E}</code>		<code>\usym{1F642}</code>
	<code>\usym{1F607}</code>		<code>\usym{1F61B}</code>		<code>\usym{1F62F}</code>		<code>\usym{1F643}</code>
	<code>\usym{1F608}</code>		<code>\usym{1F61C}</code>		<code>\usym{1F630}</code>		<code>\usym{1F644}</code>
	<code>\usym{1F609}</code>		<code>\usym{1F61D}</code>		<code>\usym{1F631}</code>		<code>\usym{1F645}</code>
	<code>\usym{1F60A}</code>		<code>\usym{1F61E}</code>		<code>\usym{1F632}</code>		<code>\usym{1F646}</code>
	<code>\usym{1F60B}</code>		<code>\usym{1F61F}</code>		<code>\usym{1F633}</code>		<code>\usym{1F647}</code>
	<code>\usym{1F60C}</code>		<code>\usym{1F620}</code>		<code>\usym{1F634}</code>		<code>\usym{1F648}</code>
	<code>\usym{1F60D}</code>		<code>\usym{1F621}</code>		<code>\usym{1F635}</code>		<code>\usym{1F649}</code>
	<code>\usym{1F60E}</code>		<code>\usym{1F622}</code>		<code>\usym{1F636}</code>		<code>\usym{1F64A}</code>
	<code>\usym{1F60F}</code>		<code>\usym{1F623}</code>		<code>\usym{1F637}</code>		<code>\usym{1F64B}</code>
	<code>\usym{1F610}</code>		<code>\usym{1F624}</code>		<code>\usym{1F638}</code>		<code>\usym{1F64C}</code>
	<code>\usym{1F611}</code>		<code>\usym{1F625}</code>		<code>\usym{1F639}</code>		<code>\usym{1F64D}</code>
	<code>\usym{1F612}</code>		<code>\usym{1F626}</code>		<code>\usym{1F63A}</code>		<code>\usym{1F64E}</code>
	<code>\usym{1F613}</code>		<code>\usym{1F627}</code>		<code>\usym{1F63B}</code>		<code>\usym{1F64F}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 629: tikzsymbols Trees

	<code>\Autumntree</code>		<code>\Summertree</code>		<code>\WorstTree</code>
	<code>\Springtree</code>		<code>\Wintertree</code>		

All `tikzsymbols` symbols are implemented with `TikZ` graphics, not with a font. Hence, all of the symbols shown above can include color. `tikzsymbols` additionally defines a `\BasicTree` command that supports customization of trunk and leaf colors. See the `tikzsymbols` documentation for more information.

TABLE 630: utfsym Love Symbols










♥	<code>\usym{1F394}</code>	♣	<code>\usym{1F490}</code>	♥	<code>\usym{1F496}</code>	♥	<code>\usym{1F49C}</code>
💋	<code>\usym{1F48B}</code>	👩	<code>\usym{1F491}</code>	♥	<code>\usym{1F497}</code>	♥	<code>\usym{1F49D}</code>
💍	<code>\usym{1F48C}</code>	👦	<code>\usym{1F492}</code>	💘	<code>\usym{1F498}</code>	♻️	<code>\usym{1F49E}</code>
👤	<code>\usym{1F48D}</code>	👧	<code>\usym{1F493}</code>	♥	<code>\usym{1F499}</code>	♻️	<code>\usym{1F49F}</code>
👤	<code>\usym{1F48E}</code>	♥	<code>\usym{1F494}</code>	♥	<code>\usym{1F49A}</code>	👩	<code>\usym{1F54A}</code>
👤	<code>\usym{1F48F}</code>	♥	<code>\usym{1F495}</code>	♥	<code>\usym{1F49B}</code>	♥	<code>\usym{1F5A4}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, “`\usymH{1F492}{36pt}`” produces









See the `utfsym` documentation for more information.

TABLE 631: Miscellaneous `tikzsymbols` Symbols

	<code>\Bed</code>		<code>\Chair</code>		<code>\Fire</code>		<code>\Snowman</code>		<code>\Tribar</code>
	<code>\Candle</code>		<code>\Coffeecup</code>		<code>\Moai</code>		<code>\Strichmaxerl</code>		









































































All `tikzsymbols` symbols are implemented with `TikZ` graphics, not with a font. `\Tribar` supports customization of the fill color for each bar. `\Strichmaxerl` supports customization of the angles at which the stick figure’s arms and legs are drawn. See the `tikzsymbols` documentation for more information.

TABLE 632: Miscellaneous `twemojis` Emoji

<b>A</b>	<code>\twemoji{1f1e6}</code>		<code>\twemoji{man in lotus position}*</code>
<b>B</b>	<code>\twemoji{1f1e7}</code>		<code>\twemoji{man in manual wheelchair}*</code>
<b>C</b>	<code>\twemoji{1f1e8}</code>		<code>\twemoji{man in motorized wheelchair}*</code>
<b>D</b>	<code>\twemoji{1f1e9}</code>		<code>\twemoji{man in steamy room}*</code>
<b>E</b>	<code>\twemoji{1f1ea}</code>		<code>\twemoji{man in tuxedo}*</code>
<b>F</b>	<code>\twemoji{1f1eb}</code>		<code>\twemoji{man judge}*</code>

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	<code>\twemoji{1f1ec}</code>		<code>\twemoji{man juggling}*</code>
	<code>\twemoji{1f1ed}</code>		<code>\twemoji{man kneeling}*</code>
	<code>\twemoji{1f1ee}</code>		<code>\twemoji{man lifting weights}*</code>
	<code>\twemoji{1f1ef}</code>		<code>\twemoji{man mage}*</code>
	<code>\twemoji{1f1f0}</code>		<code>\twemoji{man mechanic}*</code>
	<code>\twemoji{1f1f1}</code>		<code>\twemoji{man office worker}*</code>
	<code>\twemoji{1f1f2}</code>		<code>\twemoji{man pilot}*</code>
	<code>\twemoji{1f1f3}</code>		<code>\twemoji{man playing handball}*</code>
	<code>\twemoji{1f1f4}</code>		<code>\twemoji{man playing water polo}*</code>
	<code>\twemoji{1f1f5}</code>		<code>\twemoji{man police officer}*</code>
	<code>\twemoji{1f1f6}</code>		<code>\twemoji{man pouting}*</code>
	<code>\twemoji{1f1f7}</code>		<code>\twemoji{man raising hand}*</code>
	<code>\twemoji{1f1f8}</code>		<code>\twemoji{man running}*</code>
	<code>\twemoji{1f1f9}</code>		<code>\twemoji{man scientist}*</code>
	<code>\twemoji{1f1fa}</code>		<code>\twemoji{man shrugging}*</code>
	<code>\twemoji{1f1fb}</code>		<code>\twemoji{man singer}*</code>
	<code>\twemoji{1f1fc}</code>		<code>\twemoji{man standing}*</code>
	<code>\twemoji{1f1fd}</code>		<code>\twemoji{man student}*</code>
	<code>\twemoji{1f1fe}</code>		<code>\twemoji{man superhero}*</code>
	<code>\twemoji{1f1ff}</code>		<code>\twemoji{man supervillain}*</code>
	<code>\twemoji{1f468-1f3fb-200d-1f384}</code>		<code>\twemoji{man surfing}*</code>
	<code>\twemoji{1f468-1f3fc-200d-1f384}</code>		<code>\twemoji{man swimming}*</code>
	<code>\twemoji{1f468-1f3fd-200d-1f384}</code>		<code>\twemoji{man teacher}*</code>
	<code>\twemoji{1f468-1f3fe-200d-1f384}</code>		<code>\twemoji{man technologist}*</code>
	<code>\twemoji{1f468-1f3ff-200d-1f384}</code>		<code>\twemoji{man tipping hand}*</code>
	<code>\twemoji{1f468-200d-1f384}</code>		<code>\twemoji{man vampire}*</code>
	<code>\twemoji{1f469-1f3fb-200d-1f384}</code>		<code>\twemoji{man walking}*</code>
	<code>\twemoji{1f469-1f3fc-200d-1f384}</code>		<code>\twemoji{man wearing turban}*</code>
	<code>\twemoji{1f469-1f3fd-200d-1f384}</code>		<code>\twemoji{man with veil}*</code>
	<code>\twemoji{1f469-1f3fe-200d-1f384}</code>		<code>\twemoji{man with white cane}*</code>
	<code>\twemoji{1f469-1f3ff-200d-1f384}</code>		<code>\twemoji{man zombie}</code>
	<code>\twemoji{1f469-200d-1f384}</code>		<code>\twemoji{man's shoe}</code>
	<code>\twemoji{1f574-1f3fb-200d-2640-fe0f}</code>		<code>\twemoji{manual wheelchair}</code>
	<code>\twemoji{1f574-1f3fb-200d-2642-fe0f}</code>		<code>\twemoji{map of Japan}</code>
	<code>\twemoji{1f574-1f3fc-200d-2640-fe0f}</code>		<code>\twemoji{maple leaf}</code>
	<code>\twemoji{1f574-1f3fc-200d-2642-fe0f}</code>		<code>\twemoji{martial arts uniform}</code>
	<code>\twemoji{1f574-1f3fd-200d-2640-fe0f}</code>		<code>\twemoji{mechanic}*</code>
	<code>\twemoji{1f574-1f3fd-200d-2642-fe0f}</code>		<code>\twemoji{mechanical arm}</code>
	<code>\twemoji{1f574-1f3fe-200d-2640-fe0f}</code>		<code>\twemoji{mechanical leg}</code>
	<code>\twemoji{1f574-1f3fe-200d-2642-fe0f}</code>		<code>\twemoji{medical symbol}</code>
	<code>\twemoji{1f574-1f3ff-200d-2640-fe0f}</code>		<code>\twemoji{medium skin tone}</code>
	<code>\twemoji{1f574-1f3ff-200d-2642-fe0f}</code>		<code>\twemoji{medium-dark skin tone}</code>
	<code>\twemoji{1f574-fe0f-200d-2640-fe0f}</code>		<code>\twemoji{medium-light skin tone}</code>
	<code>\twemoji{1f574-fe0f-200d-2642-fe0f}</code>		<code>\twemoji{megaphone}</code>
	<code>\twemoji{1f576}</code>		<code>\twemoji{men holding hands}*</code>
	<code>\twemoji{1f6cf}</code>		<code>\twemoji{men with bunny ears}</code>

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	<code>\twemoji{1st place medal}</code>		<code>\twemoji{men wrestling}</code>
	<code>\twemoji{26f7-1f3fb}</code>		<code>\twemoji{men's room}</code>
	<code>\twemoji{26f7-1f3fc}</code>		<code>\twemoji{menorah}</code>
	<code>\twemoji{26f7-1f3fd}</code>		<code>\twemoji{mermaid}*</code>
	<code>\twemoji{26f7-1f3fe}</code>		<code>\twemoji{merman}*</code>
	<code>\twemoji{26f7-1f3ff}</code>		<code>\twemoji{merperson}*</code>
	<code>\twemoji{270f}</code>		<code>\twemoji{microphone}</code>
	<code>\twemoji{2nd place medal}</code>		<code>\twemoji{microscope}</code>
	<code>\twemoji{3rd place medal}</code>		<code>\twemoji{middle finger}*</code>
	<code>\twemoji{A button (blood type)}</code>		<code>\twemoji{military helmet}</code>
	<code>\twemoji{AB button (blood type)}</code>		<code>\twemoji{military medal}</code>
	<code>\twemoji{abacus}</code>		<code>\twemoji{milky way}</code>
	<code>\twemoji{accordion}</code>		<code>\twemoji{minus}</code>
	<code>\twemoji{adhesive bandage}</code>		<code>\twemoji{mirror}</code>
	<code>\twemoji{admission tickets}</code>		<code>\twemoji{mobile phone}</code>
	<code>\twemoji{alembic}</code>		<code>\twemoji{mobile phone off}</code>
	<code>\twemoji{alien}</code>		<code>\twemoji{mobile phone with arrow}</code>
	<code>\twemoji{alien monster}</code>		<code>\twemoji{money bag}</code>
	<code>\twemoji{american football}</code>		<code>\twemoji{money with wings}</code>
	<code>\twemoji{amphora}</code>		<code>\twemoji{money-mouth face}</code>
	<code>\twemoji{anatomical heart}</code>		<code>\twemoji{moon viewing ceremony}</code>
	<code>\twemoji{anchor}</code>		<code>\twemoji{mosque}</code>
	<code>\twemoji{anger symbol}</code>		<code>\twemoji{motorized wheelchair}</code>
	<code>\twemoji{angry face}</code>		<code>\twemoji{mount fuji}</code>
	<code>\twemoji{angry face with horns}</code>		<code>\twemoji{mountain}</code>
	<code>\twemoji{anguished face}</code>		<code>\twemoji{mouse trap}</code>
	<code>\twemoji{antenna bars}</code>		<code>\twemoji{mouth}</code>
	<code>\twemoji{anxious face with sweat}</code>		<code>\twemoji{movie camera}</code>
	<code>\twemoji{Aquarius}</code>		<code>\twemoji{moyai}</code>
	<code>\twemoji{Aries}</code>		<code>\twemoji{Mrs. Claus}*</code>
	<code>\twemoji{artist}*</code>		<code>\twemoji{multiply}</code>
	<code>\twemoji{artist palette}</code>		<code>\twemoji{musical keyboard}</code>
	<code>\twemoji{astonished face}</code>		<code>\twemoji{musical note}</code>
	<code>\twemoji{astronaut}*</code>		<code>\twemoji{musical notes}</code>
	<code>\twemoji{ATM sign}</code>		<code>\twemoji{musical score}</code>
	<code>\twemoji{atom symbol}</code>		<code>\twemoji{muted speaker}</code>
	<code>\twemoji{axe}</code>		<code>\twemoji{mx claus}*</code>
	<code>\twemoji{B button (blood type)}</code>		<code>\twemoji{nail polish}*</code>
	<code>\twemoji{baby}*</code>		<code>\twemoji{name badge}</code>
	<code>\twemoji{baby angel}*</code>		<code>\twemoji{national park}</code>
	<code>\twemoji{baby bottle}</code>		<code>\twemoji{nauseated face}</code>
	<code>\twemoji{baby symbol}</code>		<code>\twemoji{nazar amulet}</code>
	<code>\twemoji{BACK arrow}</code>		<code>\twemoji{necktie}</code>
	<code>\twemoji{backhand index pointing down}*</code>		<code>\twemoji{nerd face}</code>

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	<code>\twemoji{backhand index pointing left}</code> *		<code>\twemoji{nesting dolls}</code>
	<code>\twemoji{backhand index pointing right}</code> *		<code>\twemoji{neutral face}</code>
	<code>\twemoji{backhand index pointing up}</code> *		<code>\twemoji{NEW button}</code>
	<code>\twemoji{backpack}</code>		<code>\twemoji{newspaper}</code>
	<code>\twemoji{badminton}</code>		<code>\twemoji{next track button}</code>
	<code>\twemoji{balance scale}</code>		<code>\twemoji{NG button}</code>
	<code>\twemoji{bald}</code>		<code>\twemoji{night with stars}</code>
	<code>\twemoji{ballet shoes}</code>		<code>\twemoji{ninja}</code> *
	<code>\twemoji{balloon}</code>		<code>\twemoji{no entry}</code>
	<code>\twemoji{ballot box with ballot}</code>		<code>\twemoji{no littering}</code>
	<code>\twemoji{banjo}</code>		<code>\twemoji{no mobile phones}</code>
	<code>\twemoji{bank}</code>		<code>\twemoji{no one under eighteen}</code>
	<code>\twemoji{bar chart}</code>		<code>\twemoji{no pedestrians}</code>
	<code>\twemoji{barber pole}</code>		<code>\twemoji{no smoking}</code>
	<code>\twemoji{baseball}</code>		<code>\twemoji{non-potable water}</code>
	<code>\twemoji{basket}</code>		<code>\twemoji{nose}</code> *
	<code>\twemoji{basketball}</code>		<code>\twemoji{notebook}</code>
	<code>\twemoji{bathtub}</code>		<code>\twemoji{notebook with decorative cover}</code>
	<code>\twemoji{battery}</code>		<code>\twemoji{nut and bolt}</code>
	<code>\twemoji{beach with umbrella}</code>		<code>\twemoji{O button (blood type)}</code>
	<code>\twemoji{beaming face with smiling eyes}</code>		<code>\twemoji{office building}</code>
	<code>\twemoji{beating heart}</code>		<code>\twemoji{office worker}</code> *
	<code>\twemoji{bell}</code>		<code>\twemoji{ogre}</code>
	<code>\twemoji{bell with slash}</code>		<code>\twemoji{oil drum}</code>
	<code>\twemoji{bellhop bell}</code>		<code>\twemoji{OK button}</code>
	<code>\twemoji{bikini}</code>		<code>\twemoji{OK hand}</code> *
	<code>\twemoji{billed cap}</code>		<code>\twemoji{old key}</code>
	<code>\twemoji{biohazard}</code>		<code>\twemoji{old man}</code> *
	<code>\twemoji{birthday cake}</code>		<code>\twemoji{old woman}</code> *
	<code>\twemoji{bison}</code>		<code>\twemoji{older person}</code> *
	<code>\twemoji{black circle}</code>		<code>\twemoji{om}</code>
	<code>\twemoji{black flag}</code>		<code>\twemoji{ON! arrow}</code>
	<code>\twemoji{black heart}</code>		<code>\twemoji{oncoming fist}</code> *
	<code>\twemoji{black large square}</code>		<code>\twemoji{one-piece swimsuit}</code>
	<code>\twemoji{black medium square}</code>		<code>\twemoji{open book}</code>
	<code>\twemoji{black medium-small square}</code>		<code>\twemoji{open file folder}</code>
	<code>\twemoji{black nib}</code>		<code>\twemoji{open hands}</code> *
	<code>\twemoji{black small square}</code>		<code>\twemoji{open mailbox with lowered flag}</code>
	<code>\twemoji{black square button}</code>		<code>\twemoji{open mailbox with raised flag}</code>

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	<code>\twemoji{blossom}</code>		<code>\twemoji{Ophiuchus}</code>
	<code>\twemoji{blue book}</code>		<code>\twemoji{optical disk}</code>
	<code>\twemoji{blue circle}</code>		<code>\twemoji{orange book}</code>
	<code>\twemoji{blue heart}</code>		<code>\twemoji{orange circle}</code>
	<code>\twemoji{blue square}</code>		<code>\twemoji{orange heart}</code>
	<code>\twemoji{bomb}</code>		<code>\twemoji{orange square}</code>
	<code>\twemoji{bone}</code>		<code>\twemoji{orthodox cross}</code>
	<code>\twemoji{bookmark}</code>		<code>\twemoji{outbox tray}</code>
	<code>\twemoji{bookmark tabs}</code>		<code>\twemoji{P button}</code>
	<code>\twemoji{books}</code>		<code>\twemoji{package}</code>
	<code>\twemoji{boomerang}</code>		<code>\twemoji{page facing up}</code>
	<code>\twemoji{bouquet}</code>		<code>\twemoji{page with curl}</code>
	<code>\twemoji{bow and arrow}</code>		<code>\twemoji{pager}</code>
	<code>\twemoji{bowling}</code>		<code>\twemoji{paintbrush}</code>
	<code>\twemoji{boxing glove}</code>		<code>\twemoji{palm tree}</code>
	<code>\twemoji{boy}*</code>		<code>\twemoji{palms up together}*</code>
	<code>\twemoji{brain}</code>		<code>\twemoji{paperclip}</code>
	<code>\twemoji{breast-feeding}*</code>		<code>\twemoji{parachute}</code>
	<code>\twemoji{bricks}</code>		<code>\twemoji{part alternation mark}</code>
	<code>\twemoji{bridge at night}</code>		<code>\twemoji{party popper}</code>
	<code>\twemoji{briefcase}</code>		<code>\twemoji{partying face}</code>
	<code>\twemoji{briefs}</code>		<code>\twemoji{pause button}</code>
	<code>\twemoji{bright button}</code>		<code>\twemoji{peace symbol}</code>
	<code>\twemoji{broken heart}</code>		<code>\twemoji{pen}</code>
	<code>\twemoji{broom}</code>		<code>\twemoji{pencil}</code>
	<code>\twemoji{brown circle}</code>		<code>\twemoji{pensive face}</code>
	<code>\twemoji{brown heart}</code>		<code>\twemoji{people holding hands}*</code>
	<code>\twemoji{brown square}</code>		<code>\twemoji{people hugging}</code>
	<code>\twemoji{bucket}</code>		<code>\twemoji{people with bunny ears}</code>
	<code>\twemoji{building construction}</code>		<code>\twemoji{people wrestling}</code>
	<code>\twemoji{bullseye}</code>		<code>\twemoji{performing arts}</code>
	<code>\twemoji{bust in silhouette}</code>		<code>\twemoji{persevering face}</code>
	<code>\twemoji{busts in silhouette}</code>		<code>\twemoji{person}*</code>
	<code>\twemoji{cactus}</code>		<code>\twemoji{person bouncing ball}*</code>
	<code>\twemoji{call me hand}*</code>		<code>\twemoji{person bowing}*</code>
	<code>\twemoji{camera}</code>		<code>\twemoji{person cartwheeling}*</code>
	<code>\twemoji{camera with flash}</code>		<code>\twemoji{person climbing}*</code>
	<code>\twemoji{camping}</code>		<code>\twemoji{person facepalming}*</code>
	<code>\twemoji{Cancer}</code>		<code>\twemoji{person feeding baby}*</code>
	<code>\twemoji{candle}</code>		<code>\twemoji{person fencing}</code>
	<code>\twemoji{Capricorn}</code>		<code>\twemoji{person frowning}*</code>
	<code>\twemoji{card file box}</code>		<code>\twemoji{person gesturing NO}*</code>
	<code>\twemoji{card index}</code>		<code>\twemoji{person gesturing OK}*</code>
	<code>\twemoji{card index dividers}</code>		<code>\twemoji{person getting haircut}*</code>
	<code>\twemoji{carousel horse}</code>		<code>\twemoji{person getting massage}*</code>
	<code>\twemoji{carp streamer}</code>		<code>\twemoji{person golfing}*</code>

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	<code>\twemoji{carpentry saw}</code>		<code>\twemoji{person in bed}*</code>
	<code>\twemoji{castle}</code>		<code>\twemoji{person in lotus position}*</code>
	<code>\twemoji{cat with tears of joy}</code>		<code>\twemoji{person in manual wheelchair}*</code>
	<code>\twemoji{cat with wry smile}</code>		<code>\twemoji{person in motorized wheelchair}*</code>
	<code>\twemoji{chains}</code>		<code>\twemoji{person in steamy room}*</code>
	<code>\twemoji{chair}</code>		<code>\twemoji{person in suit levitating}*</code>
	<code>\twemoji{chart decreasing}</code>		<code>\twemoji{person in tuxedo}*</code>
	<code>\twemoji{chart increasing}</code>		<code>\twemoji{person juggling}*</code>
	<code>\twemoji{chart increasing with yen}</code>		<code>\twemoji{person kneeling}*</code>
	<code>\twemoji{check box with check}</code>		<code>\twemoji{person lifting weights}*</code>
	<code>\twemoji{check mark}</code>		<code>\twemoji{person playing handball}*</code>
	<code>\twemoji{check mark button}</code>		<code>\twemoji{person playing water polo}*</code>
	<code>\twemoji{chequered flag}</code>		<code>\twemoji{person pouting}*</code>
	<code>\twemoji{cherry blossom}</code>		<code>\twemoji{person raising hand}*</code>
	<code>\twemoji{chess pawn}</code>		<code>\twemoji{person running}*</code>
	<code>\twemoji{chestnut}</code>		<code>\twemoji{person shrugging}*</code>
	<code>\twemoji{child}*</code>		<code>\twemoji{person standing}*</code>
	<code>\twemoji{children crossing}</code>		<code>\twemoji{person surfing}*</code>
	<code>\twemoji{Christmas tree}</code>		<code>\twemoji{person swimming}*</code>
	<code>\twemoji{church}</code>		<code>\twemoji{person taking bath}*</code>
	<code>\twemoji{cigarette}</code>		<code>\twemoji{person tipping hand}*</code>
	<code>\twemoji{cinema}</code>		<code>\twemoji{person walking}*</code>
	<code>\twemoji{circled M}</code>		<code>\twemoji{person wearing turban}*</code>
	<code>\twemoji{circus tent}</code>		<code>\twemoji{person with skullcap}*</code>
	<code>\twemoji{cityscape}</code>		<code>\twemoji{person with veil}*</code>
	<code>\twemoji{cityscape at dusk}</code>		<code>\twemoji{person with white cane}*</code>
	<code>\twemoji{CL button}</code>		<code>\twemoji{petri dish}</code>
	<code>\twemoji{clamp}</code>		<code>\twemoji{pick}</code>
	<code>\twemoji{clapper board}</code>		<code>\twemoji{pile of poo}</code>
	<code>\twemoji{clapping hands}*</code>		<code>\twemoji{pill}</code>
	<code>\twemoji{classical building}</code>		<code>\twemoji{pilot}*</code>
	<code>\twemoji{clipboard}</code>		<code>\twemoji{pinched fingers}*</code>
	<code>\twemoji{clockwise vertical arrows}</code>		<code>\twemoji{pinching hand}*</code>
	<code>\twemoji{closed book}</code>		<code>\twemoji{pine decoration}</code>
	<code>\twemoji{closed mailbox with lowered flag}</code>		<code>\twemoji{ping pong}</code>
	<code>\twemoji{closed mailbox with raised flag}</code>		<code>\twemoji{Pisces}</code>
	<code>\twemoji{closed umbrella}</code>		<code>\twemoji{piñata}</code>
	<code>\twemoji{clown face}</code>		<code>\twemoji{placard}</code>
	<code>\twemoji{clutch bag}</code>		<code>\twemoji{place of worship}</code>
	<code>\twemoji{coat}</code>		<code>\twemoji{play button}</code>
	<code>\twemoji{coffin}</code>		<code>\twemoji{play or pause button}</code>
	<code>\twemoji{coin}</code>		<code>\twemoji{pleading face}</code>

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	<code>\twemoji{cold face}</code>		<code>\twemoji{plunger}</code>
	<code>\twemoji{collision}</code>		<code>\twemoji{plus}</code>
	<code>\twemoji{comet}</code>		<code>\twemoji{police officer}*</code>
	<code>\twemoji{compass}</code>		<code>\twemoji{pool 8 ball}</code>
	<code>\twemoji{computer}</code>		<code>\twemoji{post office}</code>
	<code>\twemoji{computer disk}</code>		<code>\twemoji{postal horn}</code>
	<code>\twemoji{computer mouse}</code>		<code>\twemoji{postbox}</code>
	<code>\twemoji{confetti ball}</code>		<code>\twemoji{potable water}</code>
	<code>\twemoji{confounded face}</code>		<code>\twemoji{potted plant}</code>
	<code>\twemoji{confused face}</code>		<code>\twemoji{pound banknote}</code>
	<code>\twemoji{construction worker}*</code>		<code>\twemoji{pouting cat}</code>
	<code>\twemoji{control knobs}</code>		<code>\twemoji{pouting face}</code>
	<code>\twemoji{convenience store}</code>		<code>\twemoji{prayer beads}</code>
	<code>\twemoji{cook}*</code>		<code>\twemoji{pregnant woman}*</code>
	<code>\twemoji{COOL button}</code>		<code>\twemoji{prince}*</code>
	<code>\twemoji{copyright}</code>		<code>\twemoji{princess}*</code>
	<code>\twemoji{couch and lamp}</code>		<code>\twemoji{printer}</code>
	<code>\twemoji{counterclockwise arrows button}</code>		<code>\twemoji{prohibited}</code>
	<code>\twemoji{couple with heart}*</code>		<code>\twemoji{purple circle}</code>
	<code>\twemoji{couplekiss}</code>		<code>\twemoji{purple heart}</code>
	<code>\twemoji{cowboy hat face}</code>		<code>\twemoji{purple square}</code>
	<code>\twemoji{crayon}</code>		<code>\twemoji{purse}</code>
	<code>\twemoji{credit card}</code>		<code>\twemoji{pushpin}</code>
	<code>\twemoji{cricket game}</code>		<code>\twemoji{puzzle piece}</code>
	<code>\twemoji{cross mark}</code>		<code>\twemoji{radio}</code>
	<code>\twemoji{cross mark button}</code>		<code>\twemoji{radio button}</code>
	<code>\twemoji{crossed fingers}*</code>		<code>\twemoji{radioactive}</code>
	<code>\twemoji{crossed flags}</code>		<code>\twemoji{rainbow}</code>
	<code>\twemoji{crossed swords}</code>		<code>\twemoji{raised back of hand}*</code>
	<code>\twemoji{crown}</code>		<code>\twemoji{raised fist}*</code>
	<code>\twemoji{crying cat}</code>		<code>\twemoji{raised hand}*</code>
	<code>\twemoji{crying face}</code>		<code>\twemoji{raising hands}*</code>
	<code>\twemoji{crystal ball}</code>		<code>\twemoji{razor}</code>
	<code>\twemoji{curling stone}</code>		<code>\twemoji{receipt}</code>
	<code>\twemoji{curly hair}</code>		<code>\twemoji{record button}</code>
	<code>\twemoji{curly loop}</code>		<code>\twemoji{recycling symbol}</code>
	<code>\twemoji{currency exchange}</code>		<code>\twemoji{red circle}</code>
	<code>\twemoji{cyclone}</code>		<code>\twemoji{red envelope}</code>
	<code>\twemoji{dagger}</code>		<code>\twemoji{red exclamation mark}</code>
	<code>\twemoji{dark skin tone}</code>		<code>\twemoji{red hair}</code>
	<code>\twemoji{dashing away}</code>		<code>\twemoji{red heart}</code>
	<code>\twemoji{date}</code>		<code>\twemoji{red paper lantern}</code>
	<code>\twemoji{deaf man}*</code>		<code>\twemoji{red question mark}</code>
	<code>\twemoji{deaf person}*</code>		<code>\twemoji{red square}</code>
	<code>\twemoji{deaf woman}*</code>		<code>\twemoji{red triangle pointed down}</code>


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	<code>\twemoji{deciduous tree}</code>		<code>\twemoji{red triangle pointed up}</code>
	<code>\twemoji{department store}</code>		<code>\twemoji{registered}</code>
	<code>\twemoji{derelict house}</code>		<code>\twemoji{relieved face}</code>
	<code>\twemoji{desert}</code>		<code>\twemoji{reminder ribbon}</code>
	<code>\twemoji{desert island}</code>		<code>\twemoji{repeat button}</code>
	<code>\twemoji{desktop computer}</code>		<code>\twemoji{repeat single button}</code>
	<code>\twemoji{detective}*</code>		<code>\twemoji{rescue worker's helmet}</code>
	<code>\twemoji{diamond with a dot}</code>		<code>\twemoji{restroom}</code>
	<code>\twemoji{dim button}</code>		<code>\twemoji{reverse button}</code>
	<code>\twemoji{disappointed face}</code>		<code>\twemoji{revolving hearts}</code>
	<code>\twemoji{disguised face}</code>		<code>\twemoji{ribbon}</code>
	<code>\twemoji{divide}</code>		<code>\twemoji{right anger bubble}</code>
	<code>\twemoji{diving mask}</code>		<code>\twemoji{right arrow}</code>
	<code>\twemoji{diya lamp}</code>		<code>\twemoji{right arrow curving down}</code>
	<code>\twemoji{dizzy}</code>		<code>\twemoji{right arrow curving left}</code>
	<code>\twemoji{dna}</code>		<code>\twemoji{right arrow curving up}</code>
	<code>\twemoji{dollar banknote}</code>		<code>\twemoji{right-facing fist}*</code>
	<code>\twemoji{door}</code>		<code>\twemoji{ring}</code>
	<code>\twemoji{dotted six-pointed star}</code>		<code>\twemoji{ringed planet}</code>
	<code>\twemoji{double curly loop}</code>		<code>\twemoji{robot}</code>
	<code>\twemoji{double exclamation mark}</code>		<code>\twemoji{rock}</code>
	<code>\twemoji{dove}</code>		<code>\twemoji{roll of paper}</code>
	<code>\twemoji{down arrow}</code>		<code>\twemoji{rolled-up newspaper}</code>
	<code>\twemoji{down-left arrow}</code>		<code>\twemoji{roller coaster}</code>
	<code>\twemoji{down-right arrow}</code>		<code>\twemoji{rolling on the floor laughing}</code>
	<code>\twemoji{downcast face with sweat}</code>		<code>\twemoji{rose}</code>
	<code>\twemoji{downwards button}</code>		<code>\twemoji{rosette}</code>
	<code>\twemoji{dress}</code>		<code>\twemoji{round pushpin}</code>
	<code>\twemoji{drooling face}</code>		<code>\twemoji{rugby football}</code>
	<code>\twemoji{drop of blood}</code>		<code>\twemoji{running shirt}</code>
	<code>\twemoji{droplet}</code>		<code>\twemoji{running shoe}</code>
	<code>\twemoji{drum}</code>		<code>\twemoji{sad but relieved face}</code>
	<code>\twemoji{dvd}</code>		<code>\twemoji{safety pin}</code>
	<code>\twemoji{e-mail}</code>		<code>\twemoji{safety vest}</code>
	<code>\twemoji{e50a}</code>		<code>\twemoji{Sagittarius}</code>
	<code>\twemoji{ear}*</code>		<code>\twemoji{sailboat}</code>
	<code>\twemoji{ear of corn}</code>		<code>\twemoji{Santa Claus}*</code>
	<code>\twemoji{ear with hearing aid}*</code>		<code>\twemoji{sari}</code>
	<code>\twemoji{eight-pointed star}</code>		<code>\twemoji{satellite antenna}</code>
	<code>\twemoji{eight-spoked asterisk}</code>		<code>\twemoji{saxophone}</code>
	<code>\twemoji{eject button}</code>		<code>\twemoji{scarf}</code>
	<code>\twemoji{electric plug}</code>		<code>\twemoji{school}</code>
	<code>\twemoji{elevator}</code>		<code>\twemoji{scientist}*</code>
	<code>\twemoji{elf}*</code>		<code>\twemoji{scissors}</code>
	<code>\twemoji{END arrow}</code>		<code>\twemoji{scorpius}</code>

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	<code>\twemoji{envelope}</code>		<code>\twemoji{screwdriver}</code>
	<code>\twemoji{envelope with arrow}</code>		<code>\twemoji{scroll}</code>
	<code>\twemoji{euro banknote}</code>		<code>\twemoji{seat}</code>
	<code>\twemoji{evergreen tree}</code>		<code>\twemoji{see-no-evil monkey}</code>
	<code>\twemoji{exclamation question mark}</code>		<code>\twemoji{seedling}</code>
	<code>\twemoji{exploding head}</code>		<code>\twemoji{selfie}</code> *
	<code>\twemoji{expressionless face}</code>		<code>\twemoji{sewing needle}</code>
	<code>\twemoji{eye}</code>		<code>\twemoji{shamrock}</code>
	<code>\twemoji{eye in speech bubble}</code>		<code>\twemoji{sheaf of rice}</code>
	<code>\twemoji{eyeglasses}</code>		<code>\twemoji{shield}</code>
	<code>\twemoji{eyes}</code>		<code>\twemoji{shinto shrine}</code>
	<code>\twemoji{face blowing a kiss}</code>		<code>\twemoji{shooting star}</code>
	<code>\twemoji{face savoring food}</code>		<code>\twemoji{shopping bags}</code>
	<code>\twemoji{face screaming in fear}</code>		<code>\twemoji{shopping cart}</code>
	<code>\twemoji{face vomiting}</code>		<code>\twemoji{shorts}</code>
	<code>\twemoji{face with hand over mouth}</code>		<code>\twemoji{shower}</code>
	<code>\twemoji{face with head-bandage}</code>		<code>\twemoji{shuffle tracks button}</code>
	<code>\twemoji{face with medical mask}</code>		<code>\twemoji{shushing face}</code>
	<code>\twemoji{face with monocle}</code>		<code>\twemoji{sign of the horns}</code> *
	<code>\twemoji{face with open mouth}</code>		<code>\twemoji{singer}</code> *
	<code>\twemoji{face with raised eyebrow}</code>		<code>\twemoji{skier}</code>
	<code>\twemoji{face with rolling eyes}</code>		<code>\twemoji{skis}</code>
	<code>\twemoji{face with steam from nose}</code>		<code>\twemoji{skull}</code>
	<code>\twemoji{face with symbols on mouth}</code>		<code>\twemoji{skull and crossbones}</code>
	<code>\twemoji{face with tears of joy}</code>		<code>\twemoji{sleeping face}</code>
	<code>\twemoji{face with thermometer}</code>		<code>\twemoji{sleepy face}</code>
	<code>\twemoji{face with tongue}</code>		<code>\twemoji{slightly frowning face}</code>
	<code>\twemoji{face without mouth}</code>		<code>\twemoji{slightly smiling face}</code>
	<code>\twemoji{factory}</code>		<code>\twemoji{slot machine}</code>
	<code>\twemoji{factory worker}</code> *		<code>\twemoji{small blue diamond}</code>
	<code>\twemoji{fairy}</code> *		<code>\twemoji{small orange diamond}</code>
	<code>\twemoji{fallen leaf}</code>		<code>\twemoji{smiling cat with heart-eyes}</code>
	<code>\twemoji{family}</code> *		<code>\twemoji{smiling face}</code>
	<code>\twemoji{farmer}</code> *		<code>\twemoji{smiling face with halo}</code>
	<code>\twemoji{fast down button}</code>		<code>\twemoji{smiling face with heart-eyes}</code>
	<code>\twemoji{fast reverse button}</code>		<code>\twemoji{smiling face with hearts}</code>
	<code>\twemoji{fast up button}</code>		<code>\twemoji{smiling face with horns}</code>
	<code>\twemoji{fast-forward button}</code>		<code>\twemoji{smiling face with smiling eyes}</code>
	<code>\twemoji{fax machine}</code>		<code>\twemoji{smiling face with sunglasses}</code>
	<code>\twemoji{fearful face}</code>		<code>\twemoji{smiling face with tear}</code>
	<code>\twemoji{feather}</code>		<code>\twemoji{smirking face}</code>

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	<code>\twemoji{female sign}</code>		<code>\twemoji{sneezing face}</code>
	<code>\twemoji{ferris wheel}</code>		<code>\twemoji{snow-capped mountain}</code>
	<code>\twemoji{ferry}</code>		<code>\twemoji{snowboarder}*</code>
	<code>\twemoji{field hockey}</code>		<code>\twemoji{snowflake}</code>
	<code>\twemoji{file cabinet}</code>		<code>\twemoji{snowman}</code>
	<code>\twemoji{file folder}</code>		<code>\twemoji{snowman without snow}</code>
	<code>\twemoji{film frames}</code>		<code>\twemoji{soap}</code>
	<code>\twemoji{film projector}</code>		<code>\twemoji{soccer ball}</code>
	<code>\twemoji{fire}</code>		<code>\twemoji{socks}</code>
	<code>\twemoji{fire extinguisher}</code>		<code>\twemoji{softball}</code>
	<code>\twemoji{firecracker}</code>		<code>\twemoji{SOON arrow}</code>
	<code>\twemoji{firefighter}*</code>		<code>\twemoji{SOS button}</code>
	<code>\twemoji{fireworks}</code>		<code>\twemoji{sparkle}</code>
	<code>\twemoji{fishing pole}</code>		<code>\twemoji{sparkler}</code>
	<code>\twemoji{flag in hole}</code>		<code>\twemoji{sparkles}</code>
	<code>\twemoji{flashlight}</code>		<code>\twemoji{sparkling heart}</code>
	<code>\twemoji{flat shoe}</code>		<code>\twemoji{speak-no-evil monkey}</code>
	<code>\twemoji{fleur-de-lis}</code>		<code>\twemoji{speaker high volume}</code>
	<code>\twemoji{flexed biceps}*</code>		<code>\twemoji{speaker low volume}</code>
	<code>\twemoji{floppy disk}</code>		<code>\twemoji{speaker medium volume}</code>
	<code>\twemoji{flower playing cards}</code>		<code>\twemoji{speaking head}</code>
	<code>\twemoji{flushed face}</code>		<code>\twemoji{speech balloon}</code>
	<code>\twemoji{flying disc}</code>		<code>\twemoji{spider}</code>
	<code>\twemoji{foggy}</code>		<code>\twemoji{spider web}</code>
	<code>\twemoji{folded hands}*</code>		<code>\twemoji{spiral calendar}</code>
	<code>\twemoji{foot}*</code>		<code>\twemoji{spiral notepad}</code>
	<code>\twemoji{footprints}</code>		<code>\twemoji{sponge}</code>
	<code>\twemoji{fountain}</code>		<code>\twemoji{spoon}</code>
	<code>\twemoji{fountain pen}</code>		<code>\twemoji{sports medal}</code>
	<code>\twemoji{four leaf clover}</code>		<code>\twemoji{squinting face with tongue}</code>
	<code>\twemoji{framed picture}</code>		<code>\twemoji{stadium}</code>
	<code>\twemoji{FREE button}</code>		<code>\twemoji{star}</code>
	<code>\twemoji{frowning face}</code>		<code>\twemoji{star and crescent}</code>
	<code>\twemoji{frowning face with open mouth}</code>		<code>\twemoji{star of David}</code>
	<code>\twemoji{fuel pump}</code>		<code>\twemoji{star-struck}</code>
	<code>\twemoji{funeral urn}</code>		<code>\twemoji{Statue of Liberty}</code>
	<code>\twemoji{game die}</code>		<code>\twemoji{stethoscope}</code>
	<code>\twemoji{gear}</code>		<code>\twemoji{stop button}</code>
	<code>\twemoji{gem stone}</code>		<code>\twemoji{stop sign}</code>
	<code>\twemoji{Gemini}</code>		<code>\twemoji{straight ruler}</code>
	<code>\twemoji{genie}</code>		<code>\twemoji{student}*</code>
	<code>\twemoji{ghost}</code>		<code>\twemoji{studio microphone}</code>
	<code>\twemoji{girl}*</code>		<code>\twemoji{sun with face}</code>
	<code>\twemoji{globe showing Americas}</code>		<code>\twemoji{sunflower}</code>






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	<code>\twemoji{globe showing Asia-Australia}</code>		<code>\twemoji{sunrise}</code>
	<code>\twemoji{globe showing Europe-Africa}</code>		<code>\twemoji{sunrise over mountains}</code>
	<code>\twemoji{globe with meridians}</code>		<code>\twemoji{sunset}</code>
	<code>\twemoji{gloves}</code>		<code>\twemoji{superhero}*</code>
	<code>\twemoji{glowing star}</code>		<code>\twemoji{supervillain}*</code>
	<code>\twemoji{goal net}</code>		<code>\twemoji{sweat droplets}</code>
	<code>\twemoji{goblin}</code>		<code>\twemoji{synagogue}</code>
	<code>\twemoji{goggles}</code>		<code>\twemoji{syringe}</code>
	<code>\twemoji{graduation cap}</code>		<code>\twemoji{t-shirt}</code>
	<code>\twemoji{green book}</code>		<code>\twemoji{tanabata tree}</code>
	<code>\twemoji{green circle}</code>		<code>\twemoji{Taurus}</code>
	<code>\twemoji{green heart}</code>		<code>\twemoji{teacher}*</code>
	<code>\twemoji{green square}</code>		<code>\twemoji{tear-off calendar}</code>
	<code>\twemoji{grimacing face}</code>		<code>\twemoji{technologist}*</code>
	<code>\twemoji{grinning cat}</code>		<code>\twemoji{teddy bear}</code>
	<code>\twemoji{grinning cat with smiling eyes}</code>		<code>\twemoji{telephone}</code>
	<code>\twemoji{grinning face}</code>		<code>\twemoji{telephone receiver}</code>
	<code>\twemoji{grinning face with big eyes}</code>		<code>\twemoji{telescope}</code>
	<code>\twemoji{grinning face with smiling eyes}</code>		<code>\twemoji{television}</code>
	<code>\twemoji{grinning face with sweat}</code>		<code>\twemoji{tennis}</code>
	<code>\twemoji{grinning squinting face}</code>		<code>\twemoji{tent}</code>
	<code>\twemoji{growing heart}</code>		<code>\twemoji{test tube}</code>
	<code>\twemoji{guard}*</code>		<code>\twemoji{thinking face}</code>
	<code>\twemoji{guitar}</code>		<code>\twemoji{thong sandal}</code>
	<code>\twemoji{hammer}</code>		<code>\twemoji{thought balloon}</code>
	<code>\twemoji{hammer and pick}</code>		<code>\twemoji{thread}</code>
	<code>\twemoji{hammer and wrench}</code>		<code>\twemoji{thumbs down}*</code>
	<code>\twemoji{hand with fingers splayed}*</code>		<code>\twemoji{thumbs up}*</code>
	<code>\twemoji{handbag}</code>		<code>\twemoji{ticket}</code>
	<code>\twemoji{handshake}</code>		<code>\twemoji{tired face}</code>
	<code>\twemoji{headphones}</code>		<code>\twemoji{toilet}</code>
	<code>\twemoji{headstone}</code>		<code>\twemoji{Tokyo tower}</code>
	<code>\twemoji{health worker}*</code>		<code>\twemoji{tongue}</code>
	<code>\twemoji{hear-no-evil monkey}</code>		<code>\twemoji{toolbox}</code>
	<code>\twemoji{heart decoration}</code>		<code>\twemoji{tooth}</code>
	<code>\twemoji{heart exclamation}</code>		<code>\twemoji{toothbrush}</code>
	<code>\twemoji{heart with arrow}</code>		<code>\twemoji{TOP arrow}</code>
	<code>\twemoji{heart with ribbon}</code>		<code>\twemoji{top hat}</code>
	<code>\twemoji{heavy dollar sign}</code>		<code>\twemoji{trackball}</code>
	<code>\twemoji{herb}</code>		<code>\twemoji{trade mark}</code>
	<code>\twemoji{hibiscus}</code>		<code>\twemoji{transgender symbol}</code>

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	<code>\twemoji{high voltage}</code>		<code>\twemoji{triangular flag}</code>
	<code>\twemoji{high-heeled shoe}</code>		<code>\twemoji{triangular ruler}</code>
	<code>\twemoji{hiking boot}</code>		<code>\twemoji{trident emblem}</code>
	<code>\twemoji{hindu temple}</code>		<code>\twemoji{trophy}</code>
	<code>\twemoji{hole}</code>		<code>\twemoji{trumpet}</code>
	<code>\twemoji{hollow red circle}</code>		<code>\twemoji{tulip}</code>
	<code>\twemoji{hook}</code>		<code>\twemoji{two hearts}</code>
	<code>\twemoji{horse racing}*</code>		<code>\twemoji{umbrella}</code>
	<code>\twemoji{hospital}</code>		<code>\twemoji{umbrella on ground}</code>
	<code>\twemoji{hot face}</code>		<code>\twemoji{umbrella with rain drops}</code>
	<code>\twemoji{hot springs}</code>		<code>\twemoji{unamused face}</code>
	<code>\twemoji{hotel}</code>		<code>\twemoji{unlocked}</code>
	<code>\twemoji{house}</code>		<code>\twemoji{up arrow}</code>
	<code>\twemoji{house with garden}</code>		<code>\twemoji{UP! button}</code>
	<code>\twemoji{houses}</code>		<code>\twemoji{up-down arrow}</code>
	<code>\twemoji{hugging face}</code>		<code>\twemoji{up-left arrow}</code>
	<code>\twemoji{hundred points}</code>		<code>\twemoji{up-right arrow}</code>
	<code>\twemoji{hushed face}</code>		<code>\twemoji{upside-down face}</code>
	<code>\twemoji{hut}</code>		<code>\twemoji{upwards button}</code>
	<code>\twemoji{ice hockey}</code>		<code>\twemoji{vampire}*</code>
	<code>\twemoji{ice skate}</code>		<code>\twemoji{vibration mode}</code>
	<code>\twemoji{ID button}</code>		<code>\twemoji{victory hand}*</code>
	<code>\twemoji{inbox tray}</code>		<code>\twemoji{video camera}</code>
	<code>\twemoji{incoming envelope}</code>		<code>\twemoji{video game}</code>
	<code>\twemoji{index pointing up}*</code>		<code>\twemoji{videocassette}</code>
	<code>\twemoji{infinity}</code>		<code>\twemoji{violin}</code>
	<code>\twemoji{information}</code>		<code>\twemoji{Virgo}</code>
	<code>\twemoji{input latin letters}</code>		<code>\twemoji{volcano}</code>
	<code>\twemoji{input latin lowercase}</code>		<code>\twemoji{volleyball}</code>
	<code>\twemoji{input latin uppercase}</code>		<code>\twemoji{VS button}</code>
	<code>\twemoji{input numbers}</code>		<code>\twemoji{vulcan salute}*</code>
	<code>\twemoji{input symbols}</code>		<code>\twemoji{warning}</code>
	<code>\twemoji{jack-o-lantern}</code>		<code>\twemoji{wastebasket}</code>
	<code>\twemoji{Japanese ‘‘acceptable’’ button}</code>		<code>\twemoji{watch}</code>
	<code>\twemoji{Japanese ‘‘application’’ button}</code>		<code>\twemoji{water closet}</code>
	<code>\twemoji{Japanese ‘‘bargain’’ button}</code>		<code>\twemoji{water pistol}</code>
	<code>\twemoji{Japanese ‘‘congratulations’’ button}</code>		<code>\twemoji{water wave}</code>
	<code>\twemoji{Japanese ‘‘discount’’ button}</code>		<code>\twemoji{waving hand}*</code>
	<code>\twemoji{Japanese ‘‘free of charge’’ button}</code>		<code>\twemoji{wavy dash}</code>
	<code>\twemoji{Japanese ‘‘here’’ button}</code>		<code>\twemoji{weary cat}</code>

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	<code>\twemoji{Japanese ‘monthly amount’ button}</code>		<code>\twemoji{weary face}</code>
	<code>\twemoji{Japanese ‘no vacancy’ button}</code>		<code>\twemoji{wedding}</code>
	<code>\twemoji{Japanese ‘not free of charge’ button}</code>		<code>\twemoji{wheel of dharma}</code>
	<code>\twemoji{Japanese ‘open for business’ button}</code>		<code>\twemoji{wheelchair symbol}</code>
	<code>\twemoji{Japanese ‘passing grade’ button}</code>		<code>\twemoji{white cane}</code>
	<code>\twemoji{Japanese ‘prohibited’ button}</code>		<code>\twemoji{white circle}</code>
	<code>\twemoji{Japanese ‘reserved’ button}</code>		<code>\twemoji{white exclamation mark}</code>
	<code>\twemoji{Japanese ‘secret’ button}</code>		<code>\twemoji{white flag}</code>
	<code>\twemoji{Japanese ‘service charge’ button}</code>		<code>\twemoji{white flower}</code>
	<code>\twemoji{Japanese ‘vacancy’ button}</code>		<code>\twemoji{white hair}</code>
	<code>\twemoji{Japanese castle}</code>		<code>\twemoji{white heart}</code>
	<code>\twemoji{Japanese dolls}</code>		<code>\twemoji{white large square}</code>
	<code>\twemoji{Japanese post office}</code>		<code>\twemoji{white medium square}</code>
	<code>\twemoji{Japanese symbol for beginner}</code>		<code>\twemoji{white medium-small square}</code>
	<code>\twemoji{jeans}</code>		<code>\twemoji{white question mark}</code>
	<code>\twemoji{joker}</code>		<code>\twemoji{white small square}</code>
	<code>\twemoji{joystick}</code>		<code>\twemoji{white square button}</code>
	<code>\twemoji{judge}</code> *		<code>\twemoji{wilted flower}</code>
	<code>\twemoji{kaaba}</code>		<code>\twemoji{wind chime}</code>
	<code>\twemoji{key}</code>		<code>\twemoji{window}</code>
	<code>\twemoji{keyboard}</code>		<code>\twemoji{winking face}</code>
	<code>\twemoji{keycap: 0}</code>		<code>\twemoji{winking face with tongue}</code>
	<code>\twemoji{keycap: 1}</code>		<code>\twemoji{woman}</code> *
	<code>\twemoji{keycap: 2}</code>		<code>\twemoji{woman and man holding hands}</code> *
	<code>\twemoji{keycap: 3}</code>		<code>\twemoji{woman artist}</code> *
	<code>\twemoji{keycap: 4}</code>		<code>\twemoji{woman astronaut}</code> *
	<code>\twemoji{keycap: 5}</code>		<code>\twemoji{woman bouncing ball}</code> *
	<code>\twemoji{keycap: 6}</code>		<code>\twemoji{woman bowing}</code> *
	<code>\twemoji{keycap: 7}</code>		<code>\twemoji{woman cartwheeling}</code> *
	<code>\twemoji{keycap: 8}</code>		<code>\twemoji{woman climbing}</code> *
	<code>\twemoji{keycap: 9}</code>		<code>\twemoji{woman construction worker}</code> *
	<code>\twemoji{keycap: 10}</code>		<code>\twemoji{woman cook}</code> *
	<code>\twemoji{keycap: *}</code>		<code>\twemoji{woman dancing}</code> *
	<code>\twemoji{keycap: #}</code>		<code>\twemoji{woman detective}</code> *

*(continued on next page)*



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	<code>\twemoji{kimono}</code>		<code>\twemoji{woman elf}*</code>
	<code>\twemoji{kiss}*</code>		<code>\twemoji{woman facepalming}*</code>
	<code>\twemoji{kissing cat}</code>		<code>\twemoji{woman factory worker}*</code>
	<code>\twemoji{kissing face}</code>		<code>\twemoji{woman fairy}*</code>
	<code>\twemoji{kissing face with closed eyes}</code>		<code>\twemoji{woman farmer}*</code>
	<code>\twemoji{kissing face with smiling eyes}</code>		<code>\twemoji{woman feeding baby}*</code>
	<code>\twemoji{kitchen knife}</code>		<code>\twemoji{woman firefighter}*</code>
	<code>\twemoji{kite}</code>		<code>\twemoji{woman frowning}*</code>
	<code>\twemoji{knocked-out face}</code>		<code>\twemoji{woman genie}</code>
	<code>\twemoji{knot}</code>		<code>\twemoji{woman gesturing NO}*</code>
	<code>\twemoji{lab coat}</code>		<code>\twemoji{woman gesturing OK}*</code>
	<code>\twemoji{label}</code>		<code>\twemoji{woman getting haircut}*</code>
	<code>\twemoji{lacrosse}</code>		<code>\twemoji{woman getting massage}*</code>
	<code>\twemoji{ladder}</code>		<code>\twemoji{woman golfing}*</code>
	<code>\twemoji{large blue diamond}</code>		<code>\twemoji{woman guard}*</code>
	<code>\twemoji{large orange diamond}</code>		<code>\twemoji{woman health worker}*</code>
	<code>\twemoji{last track button}</code>		<code>\twemoji{woman in lotus position}*</code>
	<code>\twemoji{latin cross}</code>		<code>\twemoji{woman in manual wheelchair}*</code>
	<code>\twemoji{leaf fluttering in wind}</code>		<code>\twemoji{woman in motorized wheelchair}*</code>
	<code>\twemoji{ledger}</code>		<code>\twemoji{woman in steamy room}*</code>
	<code>\twemoji{left arrow}</code>		<code>\twemoji{woman in tuxedo}*</code>
	<code>\twemoji{left arrow curving right}</code>		<code>\twemoji{woman judge}*</code>
	<code>\twemoji{left speech bubble}</code>		<code>\twemoji{woman juggling}*</code>
	<code>\twemoji{left-facing fist}*</code>		<code>\twemoji{woman kneeling}*</code>
	<code>\twemoji{left-right arrow}</code>		<code>\twemoji{woman lifting weights}*</code>
	<code>\twemoji{leg}*</code>		<code>\twemoji{woman mage}*</code>
	<code>\twemoji{Leo}</code>		<code>\twemoji{woman mechanic}*</code>
	<code>\twemoji{level slider}</code>		<code>\twemoji{woman office worker}*</code>
	<code>\twemoji{Libra}</code>		<code>\twemoji{woman pilot}*</code>
	<code>\twemoji{light bulb}</code>		<code>\twemoji{woman playing handball}*</code>
	<code>\twemoji{light skin tone}</code>		<code>\twemoji{woman playing water polo}*</code>
	<code>\twemoji{link}</code>		<code>\twemoji{woman police officer}*</code>
	<code>\twemoji{linked paperclips}</code>		<code>\twemoji{woman pouting}*</code>
	<code>\twemoji{lipstick}</code>		<code>\twemoji{woman raising hand}*</code>
	<code>\twemoji{litter in bin sign}</code>		<code>\twemoji{woman running}*</code>
	<code>\twemoji{locked}</code>		<code>\twemoji{woman scientist}*</code>
	<code>\twemoji{locked with key}</code>		<code>\twemoji{woman shrugging}*</code>
	<code>\twemoji{locked with pen}</code>		<code>\twemoji{woman singer}*</code>
	<code>\twemoji{long drum}</code>		<code>\twemoji{woman standing}*</code>
	<code>\twemoji{lotion bottle}</code>		<code>\twemoji{woman student}*</code>
	<code>\twemoji{loudly crying face}</code>		<code>\twemoji{woman superhero}*</code>
	<code>\twemoji{loudspeaker}</code>		<code>\twemoji{woman supervillain}*</code>

(continued on next page)

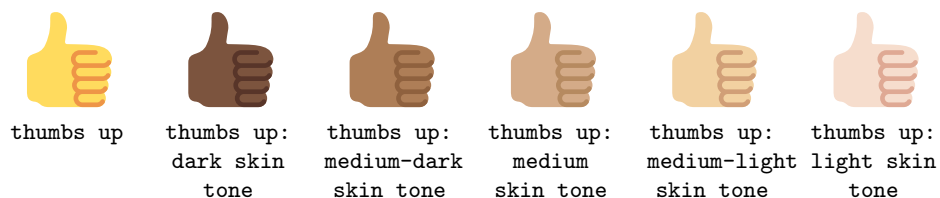
*(continued from previous page)*

	<code>\twemoji{love hotel}</code>		<code>\twemoji{woman surfing}*</code>
	<code>\twemoji{love letter}</code>		<code>\twemoji{woman swimming}*</code>
	<code>\twemoji{love-you gesture}*</code>		<code>\twemoji{woman teacher}*</code>
	<code>\twemoji{luggage}</code>		<code>\twemoji{woman technologist}*</code>
	<code>\twemoji{lungs}</code>		<code>\twemoji{woman tipping hand}*</code>
	<code>\twemoji{lying face}</code>		<code>\twemoji{woman vampire}*</code>
	<code>\twemoji{mage}*</code>		<code>\twemoji{woman walking}*</code>
	<code>\twemoji{magic wand}</code>		<code>\twemoji{woman wearing turban}*</code>
	<code>\twemoji{magnet}</code>		<code>\twemoji{woman with headscarf}*</code>
	<code>\twemoji{magnifying glass tilted left}</code>		<code>\twemoji{woman with veil}*</code>
	<code>\twemoji{magnifying glass tilted right}</code>		<code>\twemoji{woman with white cane}*</code>
	<code>\twemoji{mahjong red dragon}</code>		<code>\twemoji{woman zombie}</code>
	<code>\twemoji{male sign}</code>		<code>\twemoji{woman's boot}</code>
	<code>\twemoji{man}*</code>		<code>\twemoji{woman's clothes}</code>
	<code>\twemoji{man artist}*</code>		<code>\twemoji{woman's hat}</code>
	<code>\twemoji{man astronaut}*</code>		<code>\twemoji{woman's sandal}</code>
	<code>\twemoji{man bouncing ball}*</code>		<code>\twemoji{women holding hands}*</code>
	<code>\twemoji{man bowling}*</code>		<code>\twemoji{women with bunny ears}</code>
	<code>\twemoji{man cartwheeling}*</code>		<code>\twemoji{women wrestling}</code>
	<code>\twemoji{man climbing}*</code>		<code>\twemoji{women's room}</code>
	<code>\twemoji{man construction worker}*</code>		<code>\twemoji{wood}</code>
	<code>\twemoji{man cook}*</code>		<code>\twemoji{woozy face}</code>
	<code>\twemoji{man dancing}*</code>		<code>\twemoji{world map}</code>
	<code>\twemoji{man detective}*</code>		<code>\twemoji{worried face}</code>
	<code>\twemoji{man elf}*</code>		<code>\twemoji{wrapped gift}</code>
	<code>\twemoji{man facepalming}*</code>		<code>\twemoji{wrench}</code>
	<code>\twemoji{man factory worker}*</code>		<code>\twemoji{writing hand}*</code>
	<code>\twemoji{man fairy}*</code>		<code>\twemoji{yarn}</code>
	<code>\twemoji{man farmer}*</code>		<code>\twemoji{yawning face}</code>
	<code>\twemoji{man feeding baby}*</code>		<code>\twemoji{yellow circle}</code>
	<code>\twemoji{man firefighter}*</code>		<code>\twemoji{yellow heart}</code>
	<code>\twemoji{man frowning}*</code>		<code>\twemoji{yellow square}</code>
	<code>\twemoji{man genie}</code>		<code>\twemoji{yen banknote}</code>
	<code>\twemoji{man gesturing NO}*</code>		<code>\twemoji{yin yang}</code>
	<code>\twemoji{man gesturing OK}*</code>		<code>\twemoji{yo-yo}</code>
	<code>\twemoji{man getting haircut}*</code>		<code>\twemoji{zany face}</code>
	<code>\twemoji{man getting massage}*</code>		<code>\twemoji{zipper-mouth face}</code>
	<code>\twemoji{man golfing}*</code>		<code>\twemoji{zombie}</code>
	<code>\twemoji{man guard}*</code>		<code>\twemoji{zzz}</code>
	<code>\twemoji{man health worker}*</code>		

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.








































All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

\* Variants of this symbol portraying different colors and styles are not shown. For example, twemojis defines the following variants of “thumbs up”:



See the twemojis documentation for more information.

TABLE 633: fontawesome5 Faces

	<code>\faAngry</code>		<code>\faGrinWink</code>
	<code>\faAngry[regular]</code>		<code>\faGrinWink[regular]</code>
	<code>\faDizzy</code>		<code>\faKiss</code>
	<code>\faDizzy[regular]</code>		<code>\faKiss[regular]</code>
	<code>\faFlushed</code>		<code>\faKissBeam</code>
	<code>\faFlushed[regular]</code>		<code>\faKissBeam[regular]</code>
	<code>\faFrown</code>		<code>\faKissWinkHeart</code>
	<code>\faFrown[regular]</code>		<code>\faKissWinkHeart[regular]</code>
	<code>\faFrownOpen</code>		<code>\faLaugh</code>
	<code>\faFrownOpen[regular]</code>		<code>\faLaugh[regular]</code>
	<code>\faGrimace</code>		<code>\faLaughBeam</code>
	<code>\faGrimace[regular]</code>		<code>\faLaughBeam[regular]</code>
	<code>\faGrin*[regular]</code>		<code>\faLaughSquint</code>
	<code>\faGrin*</code>		<code>\faLaughSquint[regular]</code>
	<code>\faGrin</code>		<code>\faLaughWink</code>
	<code>\faGrin[regular]</code>		<code>\faLaughWink[regular]</code>
	<code>\faGrinBeam</code>		<code>\faMeh</code>
	<code>\faGrinBeam[regular]</code>		<code>\faMeh[regular]</code>
	<code>\faGrinBeamSweat</code>		<code>\faMehBlank</code>
	<code>\faGrinBeamSweat[regular]</code>		<code>\faMehBlank[regular]</code>

(continued on next page)

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	<code>\faGrinHearts</code>		<code>\faMehRollingEyes</code>
	<code>\faGrinHearts[regular]</code>		<code>\faMehRollingEyes[regular]</code>
	<code>\faGrinSquint</code>		<code>\faSadCry</code>
	<code>\faGrinSquint[regular]</code>		<code>\faSadCry[regular]</code>
	<code>\faGrinSquintTears</code>		<code>\faSadTear</code>
	<code>\faGrinSquintTears[regular]</code>		<code>\faSadTear[regular]</code>
	<code>\faGrinStars</code>		<code>\faSmile</code>
	<code>\faGrinStars[regular]</code>		<code>\faSmile[regular]</code>
	<code>\faGrinTears</code>		<code>\faSmileBeam</code>
	<code>\faGrinTears[regular]</code>		<code>\faSmileBeam[regular]</code>
	<code>\faGrinTongue</code>		<code>\faSmileWink</code>
	<code>\faGrinTongue[regular]</code>		<code>\faSmileWink[regular]</code>
	<code>\faGrinTongueSquint</code>		<code>\faSurprise</code>
	<code>\faGrinTongueSquint[regular]</code>		<code>\faSurprise[regular]</code>
	<code>\faGrinTongueWink</code>		<code>\faTired</code>
	<code>\faGrinTongueWink[regular]</code>		<code>\faTired[regular]</code>

TABLE 634: simpsons Characters from *The Simpsons*

	<code>\Bart</code>		<code>\Homer</code>		<code>\Maggie</code>		<code>\SNPP</code>
	<code>\Burns</code>		<code>\Lisa</code>		<code>\Marge</code>		

The location of the characters' pupils can be controlled with the `\Goofy` command. See *A METAFONT of 'Simpsons' characters* [Che98] for more information. Also, each of the above can be prefixed with `\Left` to make the character face left instead of right:





























































 `\Left\Bart`

TABLE 635: asapsym People

	<code>\asapCycling</code>		<code>\asapMaleAtDrinkingFountain</code>
	<code>\asapFemaleAdult</code>		<code>\asapMaleAtHelpDesk</code>
	<code>\asapFemaleAtDrinkingFountain</code>		<code>\asapMaleChild</code>
	<code>\asapFemaleAtHelpDesk</code>		<code>\asapMaleDiscardingTrash</code>
	<code>\asapFemaleChild</code>		<code>\asapMaleHoldingInfant</code>
	<code>\asapFemaleDiscardingTrash</code>		<code>\asapMaleWalking</code>
	<code>\asapFemaleHoldingInfant</code>		<code>\asapMaleWalkingDog</code>
	<code>\asapFemaleWalking</code>		<code>\asapMaleWalkingStroller</code>
	<code>\asapFemaleWalkingDog</code>		<code>\asapMaleWithChild</code>
	<code>\asapFemaleWalkingStroller</code>		<code>\asapMaleWithLuggageWaiting</code>
	<code>\asapFemaleWithChild</code>		<code>\asapMaleWithLuggageWaving</code>
	<code>\asapFemaleWithLuggageWaiting</code>		<code>\asapMaleWithServiceAnimal</code>
	<code>\asapFemaleWithLuggageWaving</code>		<code>\asapPregnant</code>
	<code>\asapFemaleWithServiceAnimal</code>		<code>\asapWaitingSeated</code>
	<code>\asapGroupMeeting</code>		<code>\asapWalkingCane</code>
	<code>\asapInfant</code>		<code>\asapWheelchairStationary</code>
	<code>\asapMaleAdult</code>		

asapsym requires either Lua $\LaTeX$  or X $\LaTeX$ .

TABLE 636: utfsym People and Faces


	<code>\usym{1F464}</code>		<code>\usym{1F46C}</code>		<code>\usym{1F474}</code>		<code>\usym{1F47E}</code>
	<code>\usym{1F465}</code>		<code>\usym{1F46D}</code>		<code>\usym{1F475}</code>		<code>\usym{1F47F}</code>
	<code>\usym{1F466}</code>		<code>\usym{1F46E}</code>		<code>\usym{1F476}</code>		<code>\usym{1F480}</code>
	<code>\usym{1F467}</code>		<code>\usym{1F46F}</code>		<code>\usym{1F477}</code>		<code>\usym{1F481}</code>
	<code>\usym{1F468}</code>		<code>\usym{1F470}</code>		<code>\usym{1F478}</code>		<code>\usym{1F482}</code>
	<code>\usym{1F469}</code>		<code>\usym{1F471}</code>		<code>\usym{1F479}</code>		<code>\usym{1F483}</code>
	<code>\usym{1F46A}</code>		<code>\usym{1F472}</code>		<code>\usym{1F47A}</code>		<code>\usym{1F486}</code>
	<code>\usym{1F46B}</code>		<code>\usym{1F473}</code>		<code>\usym{1F47D}</code>		<code>\usym{1F487}</code>

All utfsym symbols are implemented with TikZ graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, “`\usymH{1F475}{36pt}`” produces









See the utfsym documentation for more information.

TABLE 637: sillypage Silly Walks

	<code>\sillystep{1}</code>		<code>\sillystep{5}</code>		<code>\sillystep{9}</code>
	<code>\sillystep{2}</code>		<code>\sillystep{6}</code>		<code>\sillystep{10}</code>
	<code>\sillystep{3}</code>		<code>\sillystep{7}</code>		<code>\sillystep{11}</code>
	<code>\sillystep{4}</code>		<code>\sillystep{8}</code>		<code>\sillystep{12}</code>

All sillypage symbols are implemented with PDF graphics, not with a font.

TABLE 638: typicons Users

	<code>\tiUser</code>		<code>\tiUserAddOutline</code>		<code>\tiUserDeleteOutline</code>
	<code>\tiUserAdd</code>		<code>\tiUserDelete</code>		<code>\tiUserOutline</code>

typicons requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 639: fontawesome5 Users






























	<code>\faUser*</code>		<code>\faUserEdit</code>		<code>\faUsers</code>
	<code>\faUser</code>		<code>\faUserFriends</code>		<code>\faUsersCog</code>
	<code>\faUser[regular]</code>		<code>\faUserGraduate</code>		<code>\faUserSecret</code>
	<code>\faUserAltSlash</code>		<code>\faUserInjured</code>		<code>\faUserShield</code>
	<code>\faUserAstronaut</code>		<code>\faUserLock</code>		<code>\faUserSlash</code>
	<code>\faUserCheck</code>		<code>\faUserMd</code>		<code>\faUsersSlash</code>
	<code>\faUserCircle</code>		<code>\faUserMinus</code>		<code>\faUserTag</code>
	<code>\faUserCircle[regular]</code>		<code>\faUserNinja</code>		<code>\faUserTie</code>
	<code>\faUserClock</code>		<code>\faUserNurse</code>		<code>\faUserTimes</code>
	<code>\faUserCog</code>		<code>\faUserPlus</code>		

TABLE 640: scsnowman Snowmen

☺ `\scsnowman`

\*`\scsnowman` is drawn using TikZ. The command accepts a number of options for controlling the presence, appearance, and color of the snowman's body, eyes, nose, mouth, arms, hat, and more. See the `scsnowman` documentation for more information, but the following examples showcase a subset of the possibilities (drawn large for clarity):

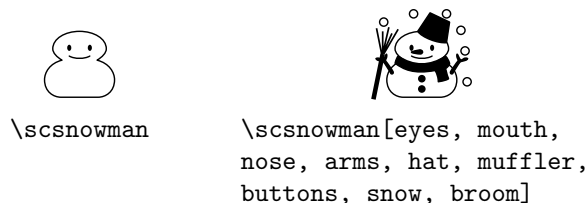










TABLE 641: typicons Files and Folders

	<code>\tiDocument</code>		<code>\tiDocumentText</code>		<code>\tiFolderDelete</code>
	<code>\tiDocumentAdd</code>		<code>\tiFolder</code>		<code>\tiFolderOpen</code>
	<code>\tiDocumentDelete</code>		<code>\tiFolderAdd</code>		

typicons requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 642: fontawesome5 Files and Folders

















































	<code>\faFile*[regular]</code>		<code>\faFileExcel[regular]</code>		<code>\faFileSignature</code>
	<code>\faFile*</code>		<code>\faFileExport</code>		<code>\faFileUpload</code>
	<code>\faFile</code>		<code>\faFileImage</code>		<code>\faFileVideo</code>
	<code>\faFile[regular]</code>		<code>\faFileImage[regular]</code>		<code>\faFileVideo[regular]</code>
	<code>\faFileArchive</code>		<code>\faFileImport</code>		<code>\faFileWord</code>
	<code>\faFileArchive[regular]</code>		<code>\faFileInvoice</code>		<code>\faFileWord[regular]</code>
	<code>\faFileAudio</code>		<code>\faFileInvoiceDollar</code>		<code>\faFolder</code>
	<code>\faFileAudio[regular]</code>		<code>\faFileMedical*</code>		<code>\faFolder[regular]</code>
	<code>\faFileCode</code>		<code>\faFileMedical</code>		<code>\faFolderMinus</code>
	<code>\faFileCode[regular]</code>		<code>\faFilePdf</code>		<code>\faFolderOpen</code>
	<code>\faFileContract</code>		<code>\faFilePdf[regular]</code>		<code>\faFolderOpen[regular]</code>
	<code>\faFileCsv</code>		<code>\faFilePowerpoint</code>		<code>\faFolderPlus</code>
	<code>\faFileDownload</code>		<code>\faFilePowerpoint[regular]</code>		
	<code>\faFileExcel</code>		<code>\faFilePrescription</code>		

TABLE 643: fontawesome5 Religion

	<code>\faAnkh</code>		<code>\faKaaba</code>		<code>\faQuran</code>
	<code>\faBahai</code>		<code>\faKhanda</code>		<code>\faStarAndCrescent</code>
	<code>\faBible</code>		<code>\faMenorah</code>		<code>\faStarOfDavid</code>
	<code>\faChurch</code>		<code>\faMosque</code>		<code>\faSynagogue</code>
	<code>\faCross</code>		<code>\faOm</code>		<code>\faTorah</code>
	<code>\faDharmachakra</code>		<code>\faPastafarianism</code>		<code>\faToriiGate</code>
	<code>\faGopuram</code>		<code>\faPlaceOfWorship</code>		<code>\faVihara</code>
	<code>\faHamsa</code>		<code>\faPray</code>		<code>\faYinYang</code>
	<code>\faHanukiah</code>		<code>\faPrayingHands</code>		

TABLE 644: utfsym Religion








	<code>\usym{1F543}</code>		<code>\usym{1F545}</code>		<code>\usym{1F54B}</code>		<code>\usym{1F54D}</code>
	<code>\usym{1F544}</code>		<code>\usym{1F549}</code>		<code>\usym{1F54C}</code>		<code>\usym{1F54E}</code>

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, “`\usymH{1f54b}{36pt}`” produces



See the `utfsym` documentation for more information.






























































TABLE 645: asapsym Elevators, Escalators, and Stairs

	<code>\asapElevator</code>		<code>\asapEscalatorUp</code>		<code>\asapStairUp</code>
	<code>\asapEscalator</code>		<code>\asapStair</code>		
	<code>\asapEscalatorDown</code>		<code>\asapStairDown</code>		

`asapsym` requires either `LuaLATEX` or `XLLATEX`.





TABLE 646: Miscellaneous bclogo Symbols

	<code>\bcattention</code>		<code>\bcetoile</code>		<code>\bcpanchant</code>
	<code>\bcbombe</code>		<code>\bcfemme</code>		<code>\bcpeaceandlove</code>
	<code>\bcbook</code>		<code>\bcfeujaune</code>		<code>\bcpluie</code>
	<code>\bccalendrier</code>		<code>\bcfeurouge</code>		<code>\bcplume</code>
	<code>\bccle</code>		<code>\bcfeutricolore</code>		<code>\bcpoisson</code>
	<code>\bcclefa</code>		<code>\bcfeuvert</code>		<code>\bcquestion</code>
	<code>\bcclesol</code>		<code>\bcfleur</code>		<code>\bcrecyclage</code>
	<code>\bccoeur</code>		<code>\bchomme</code>		<code>\bcrosevents</code>
	<code>\bccrayon</code>		<code>\bchorloge</code>		<code>\bcsmbh</code>
	<code>\bccube</code>		<code>\bcicosaedre</code>		<code>\bcsmmh</code>
	<code>\bcdallemagne</code>		<code>\bcinfo</code>		<code>\bcsoleil</code>
	<code>\bcdanger</code>		<code>\bcinterdit</code>		<code>\bcspadesuit</code>
	<code>\bcdautriche</code>		<code>\bclampe</code>		<code>\bcstop</code>
	<code>\bcdbelgique</code>		<code>\bcloupe</code>		<code>\bctakecare</code>
	<code>\bcdbulgarie</code>		<code>\bcneige</code>		<code>\bctetraedre</code>
	<code>\bcdfrance</code>		<code>\bcnote</code>		<code>\bctrefle</code>
	<code>\bcditalie</code>		<code>\bcnucleaire</code>		<code>\bctrombone</code>
	<code>\bcdluxembourg</code>		<code>\bcocetaedre</code>		<code>\bcvaletcoeur</code>
	<code>\bcdodecaedre</code>		<code>\bcoeil</code>		<code>\bcvelo</code>
	<code>\bcdpaysbas</code>		<code>\bcorne</code>		<code>\bcyin</code>
	<code>\bcdz</code>		<code>\bcours</code>		





































































































































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 `\bceclaircie`  `\bcoutil`

All `bclogo` symbols are implemented with `TikZ` (or alternatively, `PSTricks`) graphics, not with a font. This is how the symbols shown above can include color.

TABLE 647: Miscellaneous `utfsym` Symbols

	<code>\usym{1F300}</code>		<code>\usym{1F3EF}</code>		<code>\usym{1F4E3}</code>		<code>\usym{1F583}</code>
	<code>\usym{1F301}</code>		<code>\usym{1F3F0}</code>		<code>\usym{1F4E4}</code>		<code>\usym{1F584}</code>
	<code>\usym{1F302}</code>		<code>\usym{1F3F1}</code>		<code>\usym{1F4E5}</code>		<code>\usym{1F585}</code>
	<code>\usym{1F303}</code>		<code>\usym{1F3F2}</code>		<code>\usym{1F4E6}</code>		<code>\usym{1F586}</code>
	<code>\usym{1F304}</code>		<code>\usym{1F3F3}</code>		<code>\usym{1F4E7}</code>		<code>\usym{1F587}</code>
	<code>\usym{1F305}</code>		<code>\usym{1F3F4}</code>		<code>\usym{1F4E8}</code>		<code>\usym{1F588}</code>
	<code>\usym{1F306}</code>		<code>\usym{1F3F7}</code>		<code>\usym{1F4E9}</code>		<code>\usym{1F5A5}</code>
	<code>\usym{1F307}</code>		<code>\usym{1F3FA}</code>		<code>\usym{1F4EA}</code>		<code>\usym{1F5A6}</code>
	<code>\usym{1F308}</code>		<code>\usym{1F3FB}</code>		<code>\usym{1F4EB}</code>		<code>\usym{1F5A7}</code>
	<code>\usym{1F309}</code>		<code>\usym{1F3FC}</code>		<code>\usym{1F4EC}</code>		<code>\usym{1F5A8}</code>
	<code>\usym{1F30A}</code>		<code>\usym{1F3FD}</code>		<code>\usym{1F4ED}</code>		<code>\usym{1F5A9}</code>
	<code>\usym{1F30B}</code>		<code>\usym{1F3FE}</code>		<code>\usym{1F4EE}</code>		<code>\usym{1F5AA}</code>
	<code>\usym{1F30C}</code>		<code>\usym{1F3FF}</code>		<code>\usym{1F4EF}</code>		<code>\usym{1F5AB}</code>
	<code>\usym{1F30D}</code>		<code>\usym{1F43D}</code>		<code>\usym{1F4F0}</code>		<code>\usym{1F5AC}</code>
	<code>\usym{1F30E}</code>		<code>\usym{1F43E}</code>		<code>\usym{1F4F1}</code>		<code>\usym{1F5AD}</code>
	<code>\usym{1F30F}</code>		<code>\usym{1F440}</code>		<code>\usym{1F4F2}</code>		<code>\usym{1F5AE}</code>
	<code>\usym{1F310}</code>		<code>\usym{1F441}</code>		<code>\usym{1F4F3}</code>		<code>\usym{1F5AF}</code>
	<code>\usym{1F330}</code>		<code>\usym{1F442}</code>		<code>\usym{1F4F4}</code>		<code>\usym{1F5B0}</code>
	<code>\usym{1F358}</code>		<code>\usym{1F443}</code>		<code>\usym{1F4F5}</code>		<code>\usym{1F5B1}</code>
	<code>\usym{1F359}</code>		<code>\usym{1F444}</code>		<code>\usym{1F4F6}</code>		<code>\usym{1F5B2}</code>
	<code>\usym{1F380}</code>		<code>\usym{1F445}</code>		<code>\usym{1F4F7}</code>		<code>\usym{1F5B3}</code>
	<code>\usym{1F381}</code>		<code>\usym{1F463}</code>		<code>\usym{1F4F8}</code>		<code>\usym{1F5B5}</code>
	<code>\usym{1F383}</code>		<code>\usym{1F47B}</code>		<code>\usym{1F4F9}</code>		<code>\usym{1F5B6}</code>
	<code>\usym{1F384}</code>		<code>\usym{1F47C}</code>		<code>\usym{1F4FA}</code>		<code>\usym{1F5B7}</code>
	<code>\usym{1F385}</code>		<code>\usym{1F484}</code>		<code>\usym{1F4FB}</code>		<code>\usym{1F5B8}</code>
	<code>\usym{1F386}</code>		<code>\usym{1F485}</code>		<code>\usym{1F4FC}</code>		<code>\usym{1F5B9}</code>
	<code>\usym{1F387}</code>		<code>\usym{1F488}</code>		<code>\usym{1F4FD}</code>		<code>\usym{1F5BA}</code>
	<code>\usym{1F388}</code>		<code>\usym{1F489}</code>		<code>\usym{1F4FE}</code>		<code>\usym{1F5BB}</code>
	<code>\usym{1F389}</code>		<code>\usym{1F48A}</code>		<code>\usym{1F4FF}</code>		<code>\usym{1F5BC}</code>
	<code>\usym{1F38A}</code>		<code>\usym{1F4A0}</code>		<code>\usym{1F50B}</code>		<code>\usym{1F5BD}</code>
	<code>\usym{1F38B}</code>		<code>\usym{1F4A1}</code>		<code>\usym{1F50C}</code>		<code>\usym{1F5BE}</code>
	<code>\usym{1F38C}</code>		<code>\usym{1F4A2}</code>		<code>\usym{1F50D}</code>		<code>\usym{1F5BF}</code>
	<code>\usym{1F38D}</code>		<code>\usym{1F4A3}</code>		<code>\usym{1F50E}</code>		<code>\usym{1F5C0}</code>

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*(continued from previous page)*

	<code>\usym{1F38E}</code>		<code>\usym{1F4A4}</code>		<code>\usym{1F50F}</code>		<code>\usym{1F5C1}</code>
	<code>\usym{1F38F}</code>		<code>\usym{1F4A5}</code>		<code>\usym{1F510}</code>		<code>\usym{1F5C2}</code>
	<code>\usym{1F390}</code>		<code>\usym{1F4A6}</code>		<code>\usym{1F511}</code>		<code>\usym{1F5C3}</code>
	<code>\usym{1F391}</code>		<code>\usym{1F4A7}</code>		<code>\usym{1F512}</code>		<code>\usym{1F5C4}</code>
	<code>\usym{1F392}</code>		<code>\usym{1F4A8}</code>		<code>\usym{1F513}</code>		<code>\usym{1F5C5}</code>
	<code>\usym{1F393}</code>		<code>\usym{1F4A9}</code>		<code>\usym{1F514}</code>		<code>\usym{1F5C6}</code>
	<code>\usym{1F395}</code>		<code>\usym{1F4AA}</code>		<code>\usym{1F515}</code>		<code>\usym{1F5C7}</code>
	<code>\usym{1F396}</code>		<code>\usym{1F4AB}</code>		<code>\usym{1F516}</code>		<code>\usym{1F5C8}</code>
	<code>\usym{1F397}</code>		<code>\usym{1F4AC}</code>		<code>\usym{1F517}</code>		<code>\usym{1F5C9}</code>
	<code>\usym{1F398}</code>		<code>\usym{1F4AD}</code>		<code>\usym{1F518}</code>		<code>\usym{1F5CA}</code>
	<code>\usym{1F399}</code>		<code>\usym{1F4AE}</code>		<code>\usym{1F519}</code>		<code>\usym{1F5CB}</code>
	<code>\usym{1F39A}</code>		<code>\usym{1F4AF}</code>		<code>\usym{1F51A}</code>		<code>\usym{1F5CC}</code>
	<code>\usym{1F39B}</code>		<code>\usym{1F4B0}</code>		<code>\usym{1F51B}</code>		<code>\usym{1F5CD}</code>
	<code>\usym{1F39E}</code>		<code>\usym{1F4B1}</code>		<code>\usym{1F51C}</code>		<code>\usym{1F5CE}</code>
	<code>\usym{1F39F}</code>		<code>\usym{1F4B2}</code>		<code>\usym{1F51D}</code>		<code>\usym{1F5CF}</code>
	<code>\usym{1F3A0}</code>		<code>\usym{1F4B3}</code>		<code>\usym{1F51E}</code>		<code>\usym{1F5D0}</code>
	<code>\usym{1F3A1}</code>		<code>\usym{1F4B4}</code>		<code>\usym{1F51F}</code>		<code>\usym{1F5D1}</code>
	<code>\usym{1F3A2}</code>		<code>\usym{1F4B5}</code>		<code>\usym{1F520}</code>		<code>\usym{1F5D2}</code>
	<code>\usym{1F3A3}</code>		<code>\usym{1F4B6}</code>		<code>\usym{1F521}</code>		<code>\usym{1F5D3}</code>
	<code>\usym{1F3A4}</code>		<code>\usym{1F4B7}</code>		<code>\usym{1F522}</code>		<code>\usym{1F5D4}</code>
	<code>\usym{1F3A5}</code>		<code>\usym{1F4B8}</code>		<code>\usym{1F523}</code>		<code>\usym{1F5D6}</code>
	<code>\usym{1F3A6}</code>		<code>\usym{1F4B9}</code>		<code>\usym{1F524}</code>		<code>\usym{1F5D7}</code>
	<code>\usym{1F3A7}</code>		<code>\usym{1F4BA}</code>		<code>\usym{1F525}</code>		<code>\usym{1F5D8}</code>
	<code>\usym{1F3A8}</code>		<code>\usym{1F4BB}</code>		<code>\usym{1F526}</code>		<code>\usym{1F5D9}</code>
	<code>\usym{1F3A9}</code>		<code>\usym{1F4BC}</code>		<code>\usym{1F527}</code>		<code>\usym{1F5DA}</code>
	<code>\usym{1F3AA}</code>		<code>\usym{1F4BD}</code>		<code>\usym{1F528}</code>		<code>\usym{1F5DB}</code>
	<code>\usym{1F3AB}</code>		<code>\usym{1F4BE}</code>		<code>\usym{1F529}</code>		<code>\usym{1F5DC}</code>
	<code>\usym{1F3AC}</code>		<code>\usym{1F4BF}</code>		<code>\usym{1F52A}</code>		<code>\usym{1F5DD}</code>
	<code>\usym{1F3AD}</code>		<code>\usym{1F4C0}</code>		<code>\usym{1F52B}</code>		<code>\usym{1F5DE}</code>
	<code>\usym{1F3B4}</code>		<code>\usym{1F4C1}</code>		<code>\usym{1F52C}</code>		<code>\usym{1F5DF}</code>
	<code>\usym{1F3B7}</code>		<code>\usym{1F4C2}</code>		<code>\usym{1F52D}</code>		<code>\usym{1F5E0}</code>
	<code>\usym{1F3B8}</code>		<code>\usym{1F4C3}</code>		<code>\usym{1F52E}</code>		<code>\usym{1F5E1}</code>
	<code>\usym{1F3B9}</code>		<code>\usym{1F4C4}</code>		<code>\usym{1F530}</code>		<code>\usym{1F5E2}</code>
	<code>\usym{1F3BA}</code>		<code>\usym{1F4C5}</code>		<code>\usym{1F531}</code>		<code>\usym{1F5E3}</code>
	<code>\usym{1F3BB}</code>		<code>\usym{1F4C6}</code>		<code>\usym{1F532}</code>		<code>\usym{1F5E4}</code>
	<code>\usym{1F3BD}</code>		<code>\usym{1F4C7}</code>		<code>\usym{1F533}</code>		<code>\usym{1F5E5}</code>
	<code>\usym{1F3D4}</code>		<code>\usym{1F4C8}</code>		<code>\usym{1F53E}</code>		<code>\usym{1F5E6}</code>
	<code>\usym{1F3D5}</code>		<code>\usym{1F4C9}</code>		<code>\usym{1F53F}</code>		<code>\usym{1F5E7}</code>
	<code>\usym{1F3D6}</code>		<code>\usym{1F4CA}</code>		<code>\usym{1F540}</code>		<code>\usym{1F5E8}</code>
	<code>\usym{1F3D7}</code>		<code>\usym{1F4CB}</code>		<code>\usym{1F541}</code>		<code>\usym{1F5E9}</code>
	<code>\usym{1F3D8}</code>		<code>\usym{1F4CC}</code>		<code>\usym{1F542}</code>		<code>\usym{1F5EA}</code>
	<code>\usym{1F3D9}</code>		<code>\usym{1F4CD}</code>		<code>\usym{1F54F}</code>		<code>\usym{1F5EB}</code>
	<code>\usym{1F3DA}</code>		<code>\usym{1F4CE}</code>		<code>\usym{1F56B}</code>		<code>\usym{1F5EC}</code>
	<code>\usym{1F3DB}</code>		<code>\usym{1F4CF}</code>		<code>\usym{1F56C}</code>		<code>\usym{1F5ED}</code>
	<code>\usym{1F3DC}</code>		<code>\usym{1F4D0}</code>		<code>\usym{1F56D}</code>		<code>\usym{1F5EE}</code>
	<code>\usym{1F3DD}</code>		<code>\usym{1F4D1}</code>		<code>\usym{1F56E}</code>		<code>\usym{1F5EF}</code>

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	<code>\usym{1F3DE}</code>		<code>\usym{1F4D2}</code>		<code>\usym{1F56F}</code>		<code>\usym{1F5F0}</code>
	<code>\usym{1F3DF}</code>		<code>\usym{1F4D3}</code>		<code>\usym{1F571}</code>		<code>\usym{1F5F1}</code>
	<code>\usym{1F3E0}</code>		<code>\usym{1F4D4}</code>		<code>\usym{1F572}</code>		<code>\usym{1F5F2}</code>
	<code>\usym{1F3E1}</code>		<code>\usym{1F4D5}</code>		<code>\usym{1F574}</code>		<code>\usym{1F5F3}</code>
	<code>\usym{1F3E2}</code>		<code>\usym{1F4D6}</code>		<code>\usym{1F575}</code>		<code>\usym{1F5FA}</code>
	<code>\usym{1F3E3}</code>		<code>\usym{1F4D7}</code>		<code>\usym{1F577}</code>		<code>\usym{1F5FB}</code>
	<code>\usym{1F3E4}</code>		<code>\usym{1F4D8}</code>		<code>\usym{1F578}</code>		<code>\usym{1F5FC}</code>
	<code>\usym{1F3E5}</code>		<code>\usym{1F4D9}</code>		<code>\usym{1F579}</code>		<code>\usym{1F5FD}</code>
	<code>\usym{1F3E6}</code>		<code>\usym{1F4DA}</code>		<code>\usym{1F57A}</code>		<code>\usym{1F5FE}</code>
	<code>\usym{1F3E7}</code>		<code>\usym{1F4DB}</code>		<code>\usym{1F57B}</code>		<code>\usym{1F5FF}</code>
	<code>\usym{1F3E8}</code>		<code>\usym{1F4DC}</code>		<code>\usym{1F57C}</code>		<code>\usym{1F573}</code>
	<code>\usym{1F3E9}</code>		<code>\usym{1F4DD}</code>		<code>\usym{1F57D}</code>		<code>\usym{1F576}</code>
	<code>\usym{1F3EA}</code>		<code>\usym{1F4DE}</code>		<code>\usym{1F57E}</code>		<code>\usym{1F5B4}</code>
	<code>\usym{1F3EB}</code>		<code>\usym{1F4DF}</code>		<code>\usym{1F57F}</code>		<code>\usym{1F5D5}</code>
	<code>\usym{1F3EC}</code>		<code>\usym{1F4E0}</code>		<code>\usym{1F580}</code>		
	<code>\usym{1F3ED}</code>		<code>\usym{1F4E1}</code>		<code>\usym{1F581}</code>		
	<code>\usym{1F3EE}</code>		<code>\usym{1F4E2}</code>		<code>\usym{1F582}</code>		

All `utfsym` symbols are implemented with `TikZ` graphics, not with a font. In addition to `\usym`, the `utfsym` package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. See the `utfsym` documentation for more information.

TABLE 648: typicons Brand Icons

	<code>\tiDropbox</code>		<code>\tiSocialLinkedinCircular</code>
	<code>\tiSocialAtCircular</code>		<code>\tiSocialPinterest</code>
	<code>\tiSocialDribbble</code>		<code>\tiSocialPinterestCircular</code>
	<code>\tiSocialDribbbleCircular</code>		<code>\tiSocialSkype</code>
	<code>\tiSocialFacebook</code>		<code>\tiSocialSkypeOutline</code>
	<code>\tiSocialFacebookCircular</code>		<code>\tiSocialTumbler</code>
	<code>\tiSocialFlickr</code>		<code>\tiSocialTumblerCircular</code>
	<code>\tiSocialFlickrCircular</code>		<code>\tiSocialTwitter</code>
	<code>\tiSocialGithub</code>		<code>\tiSocialTwitterCircular</code>
	<code>\tiSocialGithubCircular</code>		<code>\tiSocialVimeo</code>
	<code>\tiSocialGooglePlus</code>		<code>\tiSocialVimeoCircular</code>
	<code>\tiSocialGooglePlusCircular</code>		<code>\tiSocialYoutube</code>
	<code>\tiSocialInstagram</code>		<code>\tiSocialYoutubeCircular</code>
	<code>\tiSocialInstagramCircular</code>		<code>\tiVendorAndroid</code>
	<code>\tiSocialLastFm</code>		<code>\tiVendorApple</code>
	<code>\tiSocialLastFmCircular</code>		<code>\tiVendorMicrosoft</code>
	<code>\tiSocialLinkedin</code>		

`typicons` requires either `LuaLATEX` or `XLLATEX`.

TABLE 649: fontawesome5 Brand Icons

	<code>\faAccessibleIcon</code>		<code>\faGit</code>		<code>\faRaspberryPi</code>
	<code>\faAccusoft</code>		<code>\faGithub*</code>		<code>\faRavelry</code>
	<code>\faAcquisitionsIncorporated</code>		<code>\faGithub</code>		<code>\faReact</code>
	<code>\faAdn</code>		<code>\faGithubSquare</code>		<code>\faReactEurope</code>
	<code>\faAdversal</code>		<code>\faGitkraken</code>		<code>\faReadme</code>
	<code>\faAffiliatetheme</code>		<code>\faGitlab</code>		<code>\faRebel</code>
	<code>\faAirbnb</code>		<code>\faGitSquare</code>		<code>\faReddit</code>
	<code>\faAlgolia</code>		<code>\faGitter</code>		<code>\faRedditAlien</code>
	<code>\faAlipay</code>		<code>\faGlide</code>		<code>\faRedditSquare</code>
	<code>\faAmazon</code>		<code>\faGlideG</code>		<code>\faRedhat</code>
	<code>\faAmazonPay</code>		<code>\faGofore</code>		<code>\faRedRiver</code>
	<code>\faAmelia</code>		<code>\faGoodreads</code>		<code>\faRenren</code>
	<code>\faAndroid</code>		<code>\faGoodreadsG</code>		<code>\faReplyd</code>
	<code>\faAngellist</code>		<code>\faGoogle</code>		<code>\faResearchgate</code>
	<code>\faAngrycreative</code>		<code>\faGoogleDrive</code>		<code>\faResolving</code>
	<code>\faAngular</code>		<code>\faGooglePay</code>		<code>\faRev</code>
	<code>\faApper</code>		<code>\faGooglePlay</code>		<code>\faRocketchat</code>
	<code>\faApple</code>		<code>\faGooglePlus</code>		<code>\faRockrms</code>
	<code>\faApplePay</code>		<code>\faGooglePlusG</code>		<code>\faRProject</code>
	<code>\faAppStore</code>		<code>\faGooglePlusSquare</code>		<code>\faRust</code>
	<code>\faAppStoreIos</code>		<code>\faGoogleWallet</code>		<code>\faSafari</code>
	<code>\faArtstation</code>		<code>\faGratipay</code>		<code>\faSalesforce</code>
	<code>\faAsymmetrik</code>		<code>\faGrav</code>		<code>\faSass</code>
	<code>\faAtlassian</code>		<code>\faGripfire</code>		<code>\faSchlix</code>
	<code>\faAudible</code>		<code>\faGrunt</code>		<code>\faScribd</code>
	<code>\faAutoprefixer</code>		<code>\faGuided</code>		<code>\faSearchengin</code>
	<code>\faAvianex</code>		<code>\faGulp</code>		<code>\faSellcast</code>
	<code>\faAviato</code>		<code>\faHackerNews</code>		<code>\faSellsy</code>
	<code>\faAws</code>		<code>\faHackerNewsSquare</code>		<code>\faServicestack</code>
	<code>\faBandcamp</code>		<code>\faHackerrank</code>		<code>\faShirtsinbulk</code>
	<code>\faBattleNet</code>		<code>\faHips</code>		<code>\faShopify</code>
	<code>\faBehance</code>		<code>\faHireAHelper</code>		<code>\faShopware</code>
	<code>\faBehanceSquare</code>		<code>\faHive</code>		<code>\faSimplybuilt</code>
	<code>\faBimobject</code>		<code>\faHooli</code>		<code>\faSistrix</code>
	<code>\faBitbucket</code>		<code>\faHornbill</code>		<code>\faSith</code>
	<code>\faBitcoin</code>		<code>\faHotjar</code>		<code>\faSketch</code>
	<code>\faBity</code>		<code>\faHouzz</code>		<code>\faSkyatlas</code>
	<code>\faBlackberry</code>		<code>\faHtml5</code>		<code>\faSkype</code>
	<code>\faBlackTie</code>		<code>\faHubspot</code>		<code>\faSlack</code>
	<code>\faBlogger</code>		<code>\faIcon{500px}</code>		<code>\faSlackHash</code>
	<code>\faBloggerB</code>		<code>\faIdeal</code>		<code>\faSlideshare</code>
	<code>\faBluetooth</code>		<code>\faImdb</code>		<code>\faSnapchat</code>
	<code>\faBluetoothB</code>		<code>\faInnosoft</code>		<code>\faSnapchatGhost</code>

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	<code>\faBootstrap</code>		<code>\faInstagram</code>		<code>\faSnapchatSquare</code>
	<code>\faBuffer</code>		<code>\faInstagramSquare</code>		<code>\faSoundcloud</code>
	<code>\faBuromobelexperte</code>		<code>\faInstalod</code>		<code>\faSourcetree</code>
	<code>\faBuyNLarge</code>		<code>\faIntercom</code>		<code>\faSpeakap</code>
	<code>\faBuysellads</code>		<code>\faInternetExplorer</code>		<code>\faSpeakerDeck</code>
	<code>\faCanadianMapleLeaf</code>		<code>\faInvision</code>		<code>\faSpotify</code>
	<code>\faCcAmazonPay</code>		<code>\faIoXhost</code>		<code>\faSquarespace</code>
	<code>\faCcAmex</code>		<code>\faItchIo</code>		<code>\faStackExchange</code>
	<code>\faCcApplePay</code>		<code>\faItunes</code>		<code>\faStackOverflow</code>
	<code>\faCcDinersClub</code>		<code>\faItunesNote</code>		<code>\faStackpath</code>
	<code>\faCcDiscover</code>		<code>\faJava</code>		<code>\faStaylinked</code>
	<code>\faCcJcb</code>		<code>\faJedi</code>		<code>\faSteam</code>
	<code>\faCcMastercard</code>		<code>\faJediOrder</code>		<code>\faSteamSquare</code>
	<code>\faCcPaypal</code>		<code>\faJenkins</code>		<code>\faSteamSymbol</code>
	<code>\faCcStripe</code>		<code>\faJira</code>		<code>\faStickerMule</code>
	<code>\faCcVisa</code>		<code>\faJoget</code>		<code>\faStrava</code>
	<code>\faCentercode</code>		<code>\faJoomla</code>		<code>\faStripe</code>
	<code>\faCentos</code>		<code>\faJs</code>		<code>\faStripeS</code>
	<code>\faChrome</code>		<code>\faJsFiddle</code>		<code>\faStudiovinari</code>
	<code>\faChromecast</code>		<code>\faJsSquare</code>		<code>\faStumbleupon</code>
	<code>\faCloudflare</code>		<code>\faKaggle</code>		<code>\faStumbleuponCircle</code>
	<code>\faCloudscale</code>		<code>\faKeybase</code>		<code>\faSuperpowers</code>
	<code>\faCloudsmith</code>		<code>\faKeycdn</code>		<code>\faSupple</code>
	<code>\faCloudversify</code>		<code>\faKickstarter</code>		<code>\faSuse</code>
	<code>\faCodepen</code>		<code>\faKickstarterK</code>		<code>\faSwift</code>
	<code>\faCodiepie</code>		<code>\faKorvue</code>		<code>\faSymfony</code>
	<code>\faConfluence</code>		<code>\faLaravel</code>		<code>\faTeamspeak</code>
	<code>\faConnectdevelop</code>		<code>\faLastfm</code>		<code>\faTelegram</code>
	<code>\faContao</code>		<code>\faLastfmSquare</code>		<code>\faTelegramPlane</code>
	<code>\faCottonBureau</code>		<code>\faLeanpub</code>		<code>\faTencentWeibo</code>
	<code>\faCpanel</code>		<code>\faLess</code>		<code>\faThemeco</code>
	<code>\faCriticalRole</code>		<code>\faLine</code>		<code>\faThemeisle</code>
	<code>\faCss3</code>		<code>\faLinkedin</code>		<code>\faTheRedYeti</code>
	<code>\faCuttlefish</code>		<code>\faLinkedinIn</code>		<code>\faThinkPeaks</code>
	<code>\faDailymotion</code>		<code>\faLinode</code>		<code>\faTiktok</code>
	<code>\faDAndD</code>		<code>\faLinux</code>		<code>\faTradeFederation</code>
	<code>\faDAndDBeyond</code>		<code>\faLyft</code>		<code>\faTrello</code>
	<code>\faDashcube</code>		<code>\faMagento</code>		<code>\faTumblr</code>
	<code>\faDeezer</code>		<code>\faMailchimp</code>		<code>\faTumblrSquare</code>
	<code>\faDelicious</code>		<code>\faMandalorian</code>		<code>\faTwitch</code>
	<code>\faDeploydog</code>		<code>\faMarkdown</code>		<code>\faTwitter</code>
	<code>\faDeskpro</code>		<code>\faMastodon</code>		<code>\faTwitterSquare</code>
	<code>\faDev</code>		<code>\faMaxcdn</code>		<code>\faTypo3</code>
	<code>\faDeviantart</code>		<code>\faMdb</code>		<code>\faUber</code>
	<code>\faDhl</code>		<code>\faMedapps</code>		<code>\faUbuntu</code>

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	<code>\faDiaspora</code>		<code>\faMedium</code>		<code>\faUikit</code>
	<code>\faDigg</code>		<code>\faMediumM</code>		<code>\faUmbraco</code>
	<code>\faDigitalOcean</code>		<code>\faMedrt</code>		<code>\faUncharted</code>
	<code>\faDiscord</code>		<code>\faMeetup</code>		<code>\faUniregistry</code>
	<code>\faDiscourse</code>		<code>\faMegaport</code>		<code>\faUnity</code>
	<code>\faDoChub</code>		<code>\faMendelej</code>		<code>\faUnsplash</code>
	<code>\faDocker</code>		<code>\faMicroblog</code>		<code>\faUntappd</code>
	<code>\faDraft2digital</code>		<code>\faMicrosoft</code>		<code>\faUps</code>
	<code>\faDropbox</code>		<code>\faMix</code>		<code>\faUsb</code>
	<code>\faDrupal</code>		<code>\faMixcloud</code>		<code>\faUsps</code>
	<code>\faDyalog</code>		<code>\faMixer</code>		<code>\faUssunnah</code>
	<code>\faEarlybirds</code>		<code>\faMizuni</code>		<code>\faVaadin</code>
	<code>\faEbay</code>		<code>\faModx</code>		<code>\faViacoin</code>
	<code>\faEdge</code>		<code>\faMonero</code>		<code>\faViadeo</code>
	<code>\faEdgeLegacy</code>		<code>\faNapster</code>		<code>\faViadeoSquare</code>
	<code>\faElementor</code>		<code>\faNeos</code>		<code>\faViber</code>
	<code>\faEllo</code>		<code>\faNimblr</code>		<code>\faVimeo</code>
	<code>\faEmber</code>		<code>\faNode</code>		<code>\faVimeoSquare</code>
	<code>\faEmpire</code>		<code>\faNodeJs</code>		<code>\faVimeoV</code>
	<code>\faEnvira</code>		<code>\faNpm</code>		<code>\faVine</code>
	<code>\faErlang</code>		<code>\faNs8</code>		<code>\faVk</code>
	<code>\faEthereum</code>		<code>\faNutritionix</code>		<code>\faVnv</code>
	<code>\faEtsy</code>		<code>\faOctopusDeploy</code>		<code>\faVuejs</code>
	<code>\faEvernote</code>		<code>\faOdnoklassniki</code>		<code>\faWatchmanMonitoring</code>
	<code>\faExpeditedssl</code>		<code>\faOdnoklassnikiSquare</code>		<code>\faWaze</code>
	<code>\faFacebook</code>		<code>\faOldRepublic</code>		<code>\faWeebly</code>
	<code>\faFacebookF</code>		<code>\faOpencart</code>		<code>\faWeibo</code>
	<code>\faFacebookMessenger</code>		<code>\faOpenid</code>		<code>\faWeixin</code>
	<code>\faFacebookSquare</code>		<code>\faOpera</code>		<code>\faWhatsapp</code>
	<code>\faFantasyFlightGames</code>		<code>\faOptinMonster</code>		<code>\faWhatsappSquare</code>
	<code>\faFedex</code>		<code>\faOrcid</code>		<code>\faWhmcs</code>
	<code>\faFedora</code>		<code>\faOsi</code>		<code>\faWikipediaW</code>
	<code>\faFigma</code>		<code>\faPage4</code>		<code>\faWindows</code>
	<code>\faFirefox</code>		<code>\faPagelines</code>		<code>\faWix</code>
	<code>\faFirefoxBrowser</code>		<code>\faPalfed</code>		<code>\faWizardsOfTheCoast</code>
	<code>\faFirstdraft</code>		<code>\faPatreon</code>		<code>\faWodu</code>
	<code>\faFirstOrder*</code>		<code>\faPaypal</code>		<code>\faWolfPackBattalion</code>
	<code>\faFirstOrder</code>		<code>\faPennyArcade</code>		<code>\faWordPress</code>
	<code>\faFlickr</code>		<code>\faPerbyte</code>		<code>\faWordPressSimple</code>
	<code>\faFlipboard</code>		<code>\faPeriscope</code>		<code>\faWpbeginner</code>
	<code>\faFly</code>		<code>\faPhabricator</code>		<code>\faWpexplorer</code>
	<code>\faFontAwesome*</code>		<code>\faPhoenixFramework</code>		<code>\faWpforms</code>
	<code>\faFontAwesome</code>		<code>\faPhoenixSquadron</code>		<code>\faWpressr</code>
	<code>\faFontAwesomeFlag</code>		<code>\faPhp</code>		<code>\faXbox</code>
	<code>\faFonticons</code>		<code>\faPiedPiper*</code>		<code>\faXing</code>

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








































	<code>\faFonticonsFi</code>		<code>\faPiedPiper</code>		<code>\faXingSquare</code>
	<code>\faFortAwesome*</code>		<code>\faPiedPiperHat</code>		<code>\faYahoo</code>
	<code>\faFortAwesome</code>		<code>\faPiedPiperPp</code>		<code>\faYammer</code>
	<code>\faForumBee</code>		<code>\faPiedPiperSquare</code>		<code>\faYandex</code>
	<code>\faFoursquare</code>		<code>\faPinterest</code>		<code>\faYandexInternational</code>
	<code>\faFreebsd</code>		<code>\faPinterestP</code>		<code>\faYarn</code>
	<code>\faFreeCodeCamp</code>		<code>\faPinterestSquare</code>		<code>\faYCombinator</code>
	<code>\faFulcrum</code>		<code>\faPlaystation</code>		<code>\faYelp</code>
	<code>\faGalacticRepublic</code>		<code>\faProductHunt</code>		<code>\faYoast</code>
	<code>\faGalacticSenate</code>		<code>\faPushed</code>		<code>\faYoutube</code>
	<code>\faGetPocket</code>		<code>\faPython</code>		<code>\faYoutubeSquare</code>
	<code>\faGg</code>		<code>\faQq</code>		<code>\faZhihu</code>
	<code>\faGgCircle</code>		<code>\faQuinscape</code>		
	<code>\faGit*</code>		<code>\faQuora</code>		










































TABLE 650: fontmizz Brand Icons

	<code>\mfAlpinelinux</code>		<code>\mfGoogle</code>		<code>\mfNpm</code>
	<code>\mfAngular</code>		<code>\mfGoogleAlt</code>		<code>\mfObjc</code>
	<code>\mfAngularAlt</code>		<code>\mfGoogleCode</code>		<code>\mfOpenshift</code>
	<code>\mfApache</code>		<code>\mfGoogleDevelopers</code>		<code>\mfOracle</code>
	<code>\mfArchlinux</code>		<code>\mfGradle</code>		<code>\mfOracleAlt</code>
	<code>\mfAws</code>		<code>\mfGrails</code>		<code>\mfOsx</code>
	<code>\mfAzure</code>		<code>\mfGrailsAlt</code>		<code>\mfPerl</code>
	<code>\mfBackbone</code>		<code>\mfGrunt</code>		<code>\mfPhp</code>
	<code>\mfBlackberry</code>		<code>\mfGulp</code>		<code>\mfPhpAlt</code>
	<code>\mfBootstrap</code>		<code>\mfGulpAlt</code>		<code>\mfPlayframework</code>
	<code>\mfC</code>		<code>\mfHadoop</code>		<code>\mfPlayframeworkAlt</code>
	<code>\mfCassandra</code>		<code>\mfHaskell</code>		<code>\mfPlone</code>
	<code>\mfCentos</code>		<code>\mfHeroku</code>		<code>\mfPostgres</code>
	<code>\mfClojure</code>		<code>\mfHtml</code>		<code>\mfPostgresAlt</code>
	<code>\mfCodeigniter</code>		<code>\mfHtmlfive</code>		<code>\mfPython</code>
	<code>\mfCodepen</code>		<code>\mfHtmlfiveAlt</code>		<code>\mfRaspberrypi</code>
	<code>\mfCoffeeBean</code>		<code>\mfJava</code>		<code>\mfReactjs</code>
	<code>\mfCplusplus</code>		<code>\mfJavaBold</code>		<code>\mfRedhat</code>
	<code>\mfCsharp</code>		<code>\mfJavaDuke</code>		<code>\mfRedis</code>
	<code>\mfCss</code>		<code>\mfJavascript</code>		<code>\mfRuby</code>

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	<code>\mfCssthree</code>		<code>\mfJavascriptAlt</code>		<code>\mfRubyOnRails</code>
	<code>\mfCssthreeAlt</code>		<code>\mfJetty</code>		<code>\mfRubyOnRailsAlt</code>
	<code>\mfDebian</code>		<code>\mfJquery</code>		<code>\mfRust</code>
	<code>\mfDocker</code>		<code>\mfKde</code>		<code>\mfSass</code>
	<code>\mfDreamhost</code>		<code>\mfLaravel</code>		<code>\mfSatellite</code>
	<code>\mfDthree</code>		<code>\mfLinuxMint</code>		<code>\mfScala</code>
	<code>\mfElixir</code>		<code>\mfLooking</code>		<code>\mfScalaAlt</code>
	<code>\mfElm</code>		<code>\mfMagento</code>		<code>\mfSitefinity</code>
	<code>\mfErlang</code>		<code>\mfMariadb</code>		<code>\mfSolaris</code>
	<code>\mfExherbo</code>		<code>\mfMaven</code>		<code>\mfSpring</code>
	<code>\mfFedora</code>		<code>\mfMongodb</code>		<code>\mfSuse</code>
	<code>\mfFireAlt</code>		<code>\mfMssql</code>		<code>\mfSvg</code>
	<code>\mfFreebsd</code>		<code>\mfMysql</code>		<code>\mfSymfony</code>
	<code>\mfFreecodecamp</code>		<code>\mfMysqlAlt</code>		<code>\mfThreadprint</code>
	<code>\mfGentoo</code>		<code>\mfNetbsd</code>		<code>\mfTomcat</code>
	<code>\mfGit</code>		<code>\mfNginx</code>		<code>\mfUbuntu</code>
	<code>\mfGnome</code>		<code>\mfNginxAlt</code>		<code>\mfUnity</code>
	<code>\mfGo</code>		<code>\mfNginxAlttwo</code>		<code>\mfWordpress</code>
	<code>\mfGoAlt</code>		<code>\mfNodejs</code>		<code>\mfXeLeven</code>

fontmizz requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 651: fontawesome5 Medical Symbols















































	<code>\faAllergies</code>		<code>\faFirstAid</code>		<code>\faPills</code>
	<code>\faAmbulance</code>		<code>\faHeadSideCough</code>		<code>\faPrescription</code>
	<code>\faBacteria</code>		<code>\faHeadSideCoughSlash</code>		<code>\faPrescriptionBottle*</code>
	<code>\faBacterium</code>		<code>\faHeadSideMask</code>		<code>\faPrescriptionBottle</code>
	<code>\faBandAid</code>		<code>\faHeadSideVirus</code>		<code>\faProcedures</code>
	<code>\faBiohazard</code>		<code>\faHeartbeat</code>		<code>\faPumpMedical</code>
	<code>\faBookMedical</code>		<code>\faHospital*</code>		<code>\faShieldVirus</code>
	<code>\faBrain</code>		<code>\faHospital</code>		<code>\faStethoscope</code>
	<code>\faBriefcaseMedical</code>		<code>\faHospital[regular]</code>		<code>\faSyringe</code>
	<code>\faCapsules</code>		<code>\faHospitalSymbol</code>		<code>\faTablets</code>
	<code>\faClinicMedical</code>		<code>\faHospitalUser</code>		<code>\faVirus</code>
	<code>\faCommentMedical</code>		<code>\faLaptopMedical</code>		<code>\faViruses</code>
	<code>\faCrutch</code>		<code>\faLungs</code>		<code>\faVirusSlash</code>
	<code>\faDiagnoses</code>		<code>\faLungsVirus</code>		<code>\faXRay</code>
	<code>\faDisease</code>		<code>\faMedkit</code>		
	<code>\faDna</code>		<code>\faNotesMedical</code>		

TABLE 652: fontawesome5 Disability Symbols



























































	<code>\faAmericanSignLanguageInterpreting</code>		<code>\faLowVision</code>
	<code>\faAssistiveListeningSystems</code>		<code>\faSignLanguage</code>
	<code>\faBlind</code>		<code>\faTty</code>
	<code>\faBraille</code>		<code>\faWheelchair</code>
	<code>\faDeaf</code>		

TABLE 653: asapasm Transportation Symbols

	<code>\asapAirplaneLanding</code>		<code>\asapBoat</code>
	<code>\asapAirplaneOverhead</code>		<code>\asapBus</code>
	<code>\asapAirplaneTakeoff</code>		<code>\asapHelicopter</code>
	<code>\asapAutomobile</code>		<code>\asapTaxi</code>
	<code>\asapAutomobileWithKey</code>		<code>\asapTrain</code>
	<code>\asapBicycle</code>		






































asapasm requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 654: twemojis Transportation Emoji

	<code>\twemoji{1f6f0}</code>		<code>\twemoji{mountain railway}</code>
	<code>\twemoji{aerial tramway}</code>		<code>\twemoji{no bicycles}</code>
	<code>\twemoji{airplane}</code>		<code>\twemoji{oncoming automobile}</code>
	<code>\twemoji{airplane arrival}</code>		<code>\twemoji{oncoming bus}</code>
	<code>\twemoji{airplane departure}</code>		<code>\twemoji{oncoming police car}</code>
	<code>\twemoji{ambulance}</code>		<code>\twemoji{oncoming taxi}</code>
	<code>\twemoji{articulated lorry}</code>		<code>\twemoji{passenger ship}</code>
	<code>\twemoji{auto rickshaw}</code>		<code>\twemoji{passport control}</code>
	<code>\twemoji{automobile}</code>		<code>\twemoji{person biking}*</code>
	<code>\twemoji{baggage claim}</code>		<code>\twemoji{person mountain biking}*</code>
	<code>\twemoji{bicycle}</code>		<code>\twemoji{person rowing boat}*</code>
	<code>\twemoji{bullet train}</code>		<code>\twemoji{pickup truck}</code>
	<code>\twemoji{bus}</code>		<code>\twemoji{police car}</code>
	<code>\twemoji{bus stop}</code>		<code>\twemoji{police car light}</code>
	<code>\twemoji{canoe}</code>		<code>\twemoji{racing car}</code>
	<code>\twemoji{construction}</code>		<code>\twemoji{railway car}</code>
	<code>\twemoji{customs}</code>		<code>\twemoji{railway track}</code>
	<code>\twemoji{delivery truck}</code>		<code>\twemoji{rocket}</code>
	<code>\twemoji{fire engine}</code>		<code>\twemoji{roller skate}</code>

(continued on next page)

(continued from previous page)













	<code>\twemoji{flying saucer}</code>		<code>\twemoji{ship}</code>
	<code>\twemoji{helicopter}</code>		<code>\twemoji{skateboard}</code>
	<code>\twemoji{high-speed train}</code>		<code>\twemoji{sled}</code>
	<code>\twemoji{horizontal traffic light}</code>		<code>\twemoji{small airplane}</code>
	<code>\twemoji{kick scooter}</code>		<code>\twemoji{speedboat}</code>
	<code>\twemoji{left luggage}</code>		<code>\twemoji{sport utility vehicle}</code>
	<code>\twemoji{light rail}</code>		<code>\twemoji{station}</code>
	<code>\twemoji{locomotive}</code>		<code>\twemoji{suspension railway}</code>
	<code>\twemoji{man biking}</code> *		<code>\twemoji{taxi}</code>
	<code>\twemoji{man mountain biking}</code> *		<code>\twemoji{tractor}</code>
	<code>\twemoji{man rowing boat}</code> *		<code>\twemoji{train2}</code>
	<code>\twemoji{metro}</code>		<code>\twemoji{tram}</code>
	<code>\twemoji{minibus}</code>		<code>\twemoji{tram car}</code>
	<code>\twemoji{monorail}</code>		<code>\twemoji{trolleybus}</code>
	<code>\twemoji{motor boat}</code>		<code>\twemoji{vertical traffic light}</code>
	<code>\twemoji{motor scooter}</code>		<code>\twemoji{woman biking}</code> *
	<code>\twemoji{motorcycle}</code>		<code>\twemoji{woman mountain biking}</code> *
	<code>\twemoji{motorway}</code>		<code>\twemoji{woman rowing boat}</code> *
	<code>\twemoji{mountain cableway}</code>		

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfL<sup>A</sup>T<sub>E</sub>X; the emoji package, which provides a LuaL<sup>A</sup>T<sub>E</sub>X interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .
















































































\* Variants of this symbol portraying different colors and styles are not shown. An example is presented after Table 632 on page 290. See the twemojis documentation for more information.

TABLE 655: asap<sub>sym</sub> Everyday Objects

	<code>\asapBook</code>		<code>\asapHanger</code>		<code>\asapMug</code>
	<code>\asapCigarette</code>		<code>\asapMicroscope</code>		<code>\asapPhone</code>
	<code>\asapEnvelope</code>		<code>\asapMobilePhone</code>		<code>\asapTablet</code>
	<code>\asapGift</code>		<code>\asapMonitor</code>		<code>\asapUtensils</code>

asap<sub>sym</sub> requires either LuaL<sup>A</sup>T<sub>E</sub>X or X<sub>q</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 656: typicons Everyday Objects

	<code>\tiAnchor</code>		<code>\tiFilm</code>		<code>\tiPinOutline</code>
	<code>\tiAnchorOutline</code>		<code>\tiFlag</code>		<code>\tiPiOutline</code>
	<code>\tiAttachment</code>		<code>\tiFlagOutline</code>		<code>\tiPipette</code>
	<code>\tiAttachmentOutline</code>		<code>\tiGift</code>		<code>\tiPlane</code>
	<code>\tiBeaker</code>		<code>\tiGlobe</code>		<code>\tiPlaneOutline</code>
	<code>\tiBeer</code>		<code>\tiGlobeOutline</code>		<code>\tiPlug</code>
	<code>\tiBell</code>		<code>\tiHeadphones</code>		<code>\tiPrinter</code>
	<code>\tiBook</code>		<code>\tiHome</code>		<code>\tiPuzzle</code>
	<code>\tiBriefcase</code>		<code>\tiHomeOutline</code>		<code>\tiPuzzleOutline</code>
	<code>\tiBrush</code>		<code>\tiKey</code>		<code>\tiScissors</code>
	<code>\tiBusinessCard</code>		<code>\tiKeyboard</code>		<code>\tiScissorsOutline</code>
	<code>\tiCalculator</code>		<code>\tiKeyOutline</code>		<code>\tiShoppingBag</code>
	<code>\tiCamera</code>		<code>\tiLeaf</code>		<code>\tiShoppingCart</code>
	<code>\tiCameraOutline</code>		<code>\tiLightbulb</code>		<code>\tiSpanner</code>
	<code>\tiClipboard</code>		<code>\tiLockClosed</code>		<code>\tiSpannerOutline</code>
	<code>\tiCoffee</code>		<code>\tiLockClosedOutline</code>		<code>\tiTag</code>
	<code>\tiCompass</code>		<code>\tiLockOpen</code>		<code>\tiTags</code>
	<code>\tiContacts</code>		<code>\tiLockOpenOutline</code>		<code>\tiTicket</code>
	<code>\tiCreditCard</code>		<code>\tiMail</code>		<code>\tiTrash</code>
	<code>\tiDeviceDesktop</code>		<code>\tiMap</code>		<code>\tiTree</code>
	<code>\tiDeviceLaptop</code>		<code>\tiMicrophone</code>		<code>\tiVideo</code>
	<code>\tiDevicePhone</code>		<code>\tiMicrophoneOutline</code>		<code>\tiVideoOutline</code>
	<code>\tiDeviceTablet</code>		<code>\tiMortarBoard</code>		<code>\tiWine</code>
	<code>\tiDirections</code>		<code>\tiNews</code>		<code>\tiWorld</code>
	<code>\tiEye</code>		<code>\tiPhone</code>		<code>\tiWorldOutline</code>
	<code>\tiEyeOutline</code>		<code>\tiPhoneOutline</code>		
	<code>\tiFeather</code>		<code>\tiPin</code>		





typicons requires either Lua<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 657: fontawesome5 Everyday Objects

	<code>\faAirFreshener</code>		<code>\faGlassMartini</code>		<code>\faRocket</code>
	<code>\faAnchor</code>		<code>\faGlassWhiskey</code>		<code>\faRuler</code>
	<code>\faApple*</code>		<code>\faGraduationCap</code>		<code>\faRulerCombined</code>
	<code>\faArchive</code>		<code>\faGuitar</code>		<code>\faRulerHorizontal</code>
	<code>\faArchway</code>		<code>\faHamburger</code>		<code>\faRulerVertical</code>
	<code>\faAward</code>		<code>\faHammer</code>		<code>\faSatellite</code>
	<code>\faBaby</code>		<code>\faHardHat</code>		<code>\faSatelliteDish</code>
	<code>\faBabyCarriage</code>		<code>\faHatCowboy</code>		<code>\faSchool</code>
	<code>\faBacon</code>		<code>\faHatCowboySide</code>		<code>\faScrewdriver</code>
	<code>\faBath</code>		<code>\faHatWizard</code>		<code>\faScroll</code>
	<code>\faBed</code>		<code>\faHdd</code>		<code>\faSdCard</code>
	<code>\faBeer</code>		<code>\faHdd[regular]</code>		<code>\faSeedling</code>
	<code>\faBell</code>		<code>\faHeadphones*</code>		<code>\faShield*</code>
	<code>\faBell[regular]</code>		<code>\faHeadphones</code>		<code>\faShip</code>
	<code>\faBicycle</code>		<code>\faHeadset</code>		<code>\faShoePrints</code>
	<code>\faBinoculars</code>		<code>\faHelicopter</code>		<code>\faShoppingBag</code>
	<code>\faBirthdayCake</code>		<code>\faHome</code>		<code>\faShoppingBasket</code>
	<code>\faBlender</code>		<code>\faHotdog</code>		<code>\faShoppingCart</code>
	<code>\faBlenderPhone</code>		<code>\faHotel</code>		<code>\faShower</code>
	<code>\faBomb</code>		<code>\faHotTub</code>		<code>\faShuttleVan</code>
	<code>\faBone</code>		<code>\faIceCream</code>		<code>\faSign</code>
	<code>\faBong</code>		<code>\faIgloo</code>		<code>\faSimCard</code>
	<code>\faBox</code>		<code>\faJoint</code>		<code>\faSink</code>
	<code>\faBoxes</code>		<code>\faKey</code>		<code>\faSleigh</code>
	<code>\faBoxOpen</code>		<code>\faKeyboard</code>		<code>\faSmoking</code>
	<code>\faBoxTissue</code>		<code>\faKeyboard[regular]</code>		<code>\faSnowman</code>
	<code>\faBreadSlice</code>		<code>\faLandmark</code>		<code>\faSnowplow</code>
	<code>\faBriefcase</code>		<code>\faLaptop</code>		<code>\faSoap</code>
	<code>\faBroom</code>		<code>\faLeaf</code>		<code>\faSocks</code>
	<code>\faBrush</code>		<code>\faLemon</code>		<code>\faSolarPanel</code>
	<code>\faBuilding</code>		<code>\faLemon[regular]</code>		<code>\faSpaceShuttle</code>
	<code>\faBuilding[regular]</code>		<code>\faLifeRing</code>		<code>\faSprayCan</code>
	<code>\faBullhorn</code>		<code>\faLifeRing[regular]</code>		<code>\faStamp</code>
	<code>\faBus*</code>		<code>\faLightbulb</code>		<code>\faStickyNote</code>
	<code>\faBus</code>		<code>\faLightbulb[regular]</code>		<code>\faStickyNote[regular]</code>
	<code>\faCalculator</code>		<code>\faLock</code>		<code>\faStore*</code>
	<code>\faCamera</code>		<code>\faLockOpen</code>		<code>\faStore</code>
	<code>\faCameraRetro</code>		<code>\faLuggageCart</code>		<code>\faStroopwafel</code>
	<code>\faCandyCane</code>		<code>\faMagnet</code>		<code>\faSubway</code>
	<code>\faCannabis</code>		<code>\faMale</code>		<code>\faSuitcase</code>
	<code>\faCar*</code>		<code>\faMap</code>		<code>\faSuitcaseRolling</code>
	<code>\faCar</code>		<code>\faMap[regular]</code>		<code>\faSwatchbook</code>

*(continued on next page)*

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	<code>\faCaravan</code>		<code>\faMask</code>		<code>\faSwimmingPool</code>
	<code>\faCarBattery</code>		<code>\faMedal</code>		<code>\faTablet*</code>
	<code>\faCarrot</code>		<code>\faMemory</code>		<code>\faTablet</code>
	<code>\faCarSide</code>		<code>\faMeteor</code>		<code>\faTag</code>
	<code>\faCashRegister</code>		<code>\faMicrochip</code>		<code>\faTags</code>
	<code>\faChair</code>		<code>\faMicrophone*</code>		<code>\faTape</code>
	<code>\faChalkboard</code>		<code>\faMicrophone</code>		<code>\faTaxi</code>
	<code>\faCheese</code>		<code>\faMicroscope</code>		<code>\faTeeth</code>
	<code>\faChild</code>		<code>\faMitten</code>		<code>\faTeethOpen</code>
	<code>\faCity</code>		<code>\faMobile*</code>		<code>\faTheaterMasks</code>
	<code>\faCocktail</code>		<code>\faMobile</code>		<code>\faThermometer</code>
	<code>\faCoffee</code>		<code>\faMoneyBill*[regular]</code>		<code>\faThumbtack</code>
	<code>\faCoins</code>		<code>\faMoneyBill*</code>		<code>\faTicket*</code>
	<code>\faCompactDisc</code>		<code>\faMoneyBill</code>		<code>\faToilet</code>
	<code>\faCompass</code>		<code>\faMoneyBillWave*</code>		<code>\faToiletPaper</code>
	<code>\faCompass[regular]</code>		<code>\faMoneyBillWave</code>		<code>\faToolbox</code>
	<code>\faConciergeBell</code>		<code>\faMoneyCheck*</code>		<code>\faTools</code>
	<code>\faCookie</code>		<code>\faMoneyCheck</code>		<code>\faTooth</code>
	<code>\faCookieBite</code>		<code>\faMonument</code>		<code>\faTractor</code>
	<code>\faCouch</code>		<code>\faMoon</code>		<code>\faTrafficLight</code>
	<code>\faCreditCard</code>		<code>\faMoon[regular]</code>		<code>\faTrailer</code>
	<code>\faCreditCard[regular]</code>		<code>\faMortarPestle</code>		<code>\faTrain</code>
	<code>\faCrown</code>		<code>\faMotorcycle</code>		<code>\faTram</code>
	<code>\faDolly</code>		<code>\faMountain</code>		<code>\faTrash*[regular]</code>
	<code>\faDollyFlatbed</code>		<code>\faMouse</code>		<code>\faTrash*</code>
	<code>\faDoorClosed</code>		<code>\faMugHot</code>		<code>\faTrash</code>
	<code>\faDoorOpen</code>		<code>\faNewspaper</code>		<code>\faTree</code>
	<code>\faDraftingCompass</code>		<code>\faNewspaper[regular]</code>		<code>\faTrophy</code>
	<code>\faDrum</code>		<code>\faOilCan</code>		<code>\faTruck</code>
	<code>\faDrumSteelpan</code>		<code>\faPager</code>		<code>\faTruckLoading</code>
	<code>\faDrumstickBite</code>		<code>\faPaintBrush</code>		<code>\faTruckMonster</code>
	<code>\faDumpster</code>		<code>\faPaintRoller</code>		<code>\faTruckMoving</code>
	<code>\faDungeon</code>		<code>\faPalette</code>		<code>\faTruckPickup</code>
	<code>\faEgg</code>		<code>\faPallet</code>		<code>\faTshirt</code>
	<code>\faEyeDropper</code>		<code>\faPaperclip</code>		<code>\faTv</code>
	<code>\faFan</code>		<code>\faPaperPlane</code>		<code>\faUmbrella</code>
	<code>\faFaucet</code>		<code>\faPaperPlane[regular]</code>		<code>\faUmbrellaBeach</code>
	<code>\faFax</code>		<code>\faParachuteBox</code>		<code>\faUniversity</code>
	<code>\faFeather*</code>		<code>\faPencilRuler</code>		<code>\faUnlock*</code>
	<code>\faFeather</code>		<code>\faPepperHot</code>		<code>\faUnlock</code>
	<code>\faFemale</code>		<code>\faPhone*</code>		<code>\faUtensils</code>
	<code>\faFighterJet</code>		<code>\faPhone</code>		<code>\faUtensilSpoon</code>
	<code>\faFireExtinguisher</code>		<code>\faPiggyBank</code>		<code>\faVest</code>
	<code>\faFlask</code>		<code>\faPizzaSlice</code>		<code>\faVestPatches</code>

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












































	<code>\faGamepad</code>		<code>\faPlane</code>		<code>\faVial</code>
	<code>\faGasPump</code>		<code>\faPlug</code>		<code>\faVials</code>
	<code>\faGavel</code>		<code>\faPumpSoap</code>		<code>\faVrCardboard</code>
	<code>\faGem</code>		<code>\faPuzzlePiece</code>		<code>\faWallet</code>
	<code>\faGem[regular]</code>		<code>\faRainbow</code>		<code>\faWarehouse</code>
	<code>\faGhost</code>		<code>\faReceipt</code>		<code>\faWeightHanging</code>
	<code>\faGift</code>		<code>\faRecordVinyl</code>		<code>\faWineBottle</code>
	<code>\faGifts</code>		<code>\faRibbon</code>		<code>\faWineGlass*</code>
	<code>\faGlassCheers</code>		<code>\faRing</code>		<code>\faWineGlass</code>
	<code>\faGlasses</code>		<code>\faRoad</code>		<code>\faWrench</code>
	<code>\faGlassMartini*</code>		<code>\faRobot</code>		

TABLE 658: figchild Everyday Objects

	<code>\fcAbajourA</code>		<code>\fcEar</code>		<code>\fcRazor</code>
	<code>\fcAbajourB</code>		<code>\fcExcavator</code>		<code>\fcRobe</code>
	<code>\fcAbajourC</code>		<code>\fcFaceTowel</code>		<code>\fcSandal</code>
	<code>\fcAbajourD</code>		<code>\fcFan</code>		<code>\fcSchoolbag</code>
	<code>\fcAlarmClockA</code>		<code>\fcFanA</code>		<code>\fcScissors</code>
	<code>\fcAlarmClockB</code>		<code>\fcFlashlight</code>		<code>\fcScooter</code>
	<code>\fcAppleTree</code>		<code>\fcFlower</code>		<code>\fcSeeds</code>
	<code>\fcBabe</code>		<code>\fcFlowerA</code>		<code>\fcSheet</code>
	<code>\fcBall</code>		<code>\fcFlowerB</code>		<code>\fcsheetA</code>
	<code>\fcBallA</code>		<code>\fcFlowerC</code>		<code>\fcsheetB</code>
	<code>\fcBallB</code>		<code>\fcFlowerD</code>		<code>\fcShip</code>
	<code>\fcBallC</code>		<code>\fcFlowerE</code>		<code>\fcShower</code>

(continued on next page)

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	<code>\fcBalloon</code>		<code>\fcFlowerF</code>		<code>\fcSleepingBag</code>
	<code>\fcBalloonsA</code>		<code>\fcFlowerG</code>		<code>\fcSnowflake</code>
	<code>\fcBalloonsB</code>		<code>\fcFlowerH</code>		<code>\fcSock</code>
	<code>\fcBarquet</code>		<code>\fcFlowerP</code>		<code>\fcSofaA</code>
	<code>\fcBaseballBat</code>		<code>\fcGlass</code>		<code>\fcSofaB</code>
	<code>\fcBed</code>		<code>\fcGloves</code>		<code>\fcSpray</code>
	<code>\fcBellaA</code>		<code>\fcHand</code>		<code>\fcSteamroller</code>
	<code>\fcBike</code>		<code>\fcHat</code>		<code>\fcStoolA</code>
	<code>\fcBinoculars</code>		<code>\fcHatA</code>		<code>\fcStoolB</code>
	<code>\fcBoat</code>		<code>\fcHelicopter</code>		<code>\fcStoolC</code>
	<code>\fcBonnet</code>		<code>\fcHouse</code>		<code>\fcSubmarineA</code>
	<code>\fcBookA</code>		<code>\fcHouseA</code>		<code>\fcTableLight</code>
	<code>\fcBookB</code>		<code>\fcHouseB</code>		<code>\fcTelevision</code>
	<code>\fcBroom</code>		<code>\fcJuicy</code>		<code>\fcTent</code>
	<code>\fcBud</code>		<code>\fcKey</code>		<code>\fcThroat</code>
	<code>\fcBus</code>		<code>\fcKite</code>		<code>\fcToiletPaper</code>
	<code>\fcCactooopuntia</code>		<code>\fcKiteA</code>		<code>\fcTornado</code>
	<code>\fcCactusA</code>		<code>\fcKnees</code>		<code>\fcTractorA</code>
	<code>\fcCactusB</code>		<code>\fcLamp</code>		<code>\fcTractorB</code>
	<code>\fcCandle</code>		<code>\fcLanguage</code>		<code>\fcTrain</code>
	<code>\fcCar</code>		<code>\fcLightBulb</code>		<code>\fcTree</code>
	<code>\fcCarA</code>		<code>\fcLightning</code>		<code>\fcTricycle</code>
	<code>\fcCart</code>		<code>\fcMailbox</code>		<code>\fcTruck</code>

*(continued on next page)*



*(continued from previous page)*



















	<code>\fcCartA</code>		<code>\fcMailBoxA</code>		<code>\fcTruckA</code>
	<code>\fcCellPhone</code>		<code>\fcMat</code>		<code>\fcTruckB</code>
	<code>\fcChairA</code>		<code>\fcMeton</code>		<code>\fcTruckC</code>
	<code>\fcChairB</code>		<code>\fcMill</code>		<code>\fcTruckD</code>
	<code>\fcChairC</code>		<code>\fcMirror</code>		<code>\fcTruckE</code>
	<code>\fcChairD</code>		<code>\fcMonster</code>		<code>\fcTruckF</code>
	<code>\fcChristmasTree</code>		<code>\fcMotorcycle</code>		<code>\fcTruckG</code>
	<code>\fcChrysanthemum</code>		<code>\fcMotorcycleA</code>		<code>\fcTruckH</code>
	<code>\fcCoach</code>		<code>\fcNose</code>		<code>\fcTrunk</code>
	<code>\fcComb</code>		<code>\fcPalmTree</code>		<code>\fcTulip</code>
	<code>\fcComputer</code>		<code>\fcPencil</code>		<code>\fcUmbrella</code>
	<code>\fcCrane</code>		<code>\fcPencilA</code>		<code>\fcVan</code>
	<code>\fcCrownA</code>		<code>\fcPhone</code>		<code>\fcVase</code>
	<code>\fcCushion</code>		<code>\fcpink</code>		<code>\fcWagon</code>
	<code>\fcDaisy</code>		<code>\fcPlane</code>		<code>\fcWardrobe</code>
	<code>\fcDarts</code>		<code>\fcPlaneA</code>		<code>\fcWateringCan</code>
	<code>\fcData</code>		<code>\fcPumpkinA</code>		<code>\fcYo-yo</code>
	<code>\fcDressingTable</code>		<code>\fcPyramid</code>		
	<code>\fcDryer</code>		<code>\fcRake</code>		

TABLE 659: Miscellaneous asapsym Symbols

	<code>\asapCross</code>		<code>\asapLocker</code>
	<code>\asapDog</code>		<code>\asapLostAndFound</code>

asapsym requires either Lua<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 660: Miscellaneous typicons Symbols

@	\tiAt	♥	\tiHeartHalfOutline	⊗	\tiPointOfInterestOutline
⚡	\tiFlash	♡	\tiHeartOutline	⊗	\tiRadar
⚡	\tiFlashOutline	🎵	\tiNotes	⊗	\tiRadarOutline
♥	\tiHeart	🎵	\tiNotesOutline	⊗	\tiSpiral
♥	\tiHeartFullOutline	⊗	\tiPointOfInterest		

typicons requires either LuaL<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

TABLE 661: Miscellaneous fontawesome5 Symbols











































































	\faAtlas		\faGlobe		\faPersonBooth
	\faAtom		\faGlobeAfrica		\faPhoneSlash
	\faBalanceScale		\faGlobeAmericas		\faPhoneSquare*
	\faBalanceScaleLeft		\faGlobeAsia		\faPhoneSquare
	\faBalanceScaleRight		\faGlobeEurope		\faPhoneVolume
	\faBan		\faHeart		\faPlaneArrival
	\faBarcode		\faHeart[regular]		\faPlaneDeparture
	\faBezierCurve		\faHeartBroken		\faPlaneSlash
	\faBolt		\faHiking		\faPoo
	\faBook		\faHollyBerry		\faPooStorm
	\faBookDead		\faHouseDamage		\faRadiation*
	\faBookOpen		\faHouseUser		\faRadiation
	\faBookReader		\faHSquare		\faRepublican
	\faBroadcastTower		\faIdBadge		\faRestroom
	\faBullseye		\faIdBadge[regular]		\faRunning
	\faBurn		\faIdCard*		\faShippingFast
	\faCampground		\faIdCard		\faSkull
	\faCarCrash		\faIdCard[regular]		\faSkullCrossbones
	\faCertificate		\faIndustry		\faSmokingBan
	\faChalkboardTeacher		\faJournalWhills		\faSpa
	\faChargingStation		\faLaptopHouse		\faPlotch
	\faClipboardList		\faMagic		\faToiletPaperSlash
	\faCogs		\faMapSigns		\faVoteYea
	\faCube		\faMercury		\faWalking
	\faCubes		\faParking		\faWater
	\faDemocrat		\faPassport		\faWaveSquare
	\faDirections		\faPaw		\faWeight
	\faDumpsterFire		\faPeace		
	\faFire		\faPeopleArrows		
	\faFunnelDollar		\faPeopleCarry		

TABLE 662: Miscellaneous fontmfizz Symbols

	<code>\mfAntenna</code>		<code>\mfLineGraph</code>		<code>\mfPhoneRetro</code>
	<code>\mfBomb</code>		<code>\mfMicroscope</code>		<code>\mfScript</code>
	<code>\mfDatabase</code>		<code>\mfMobileDevice</code>		<code>\mfScriptAlt</code>
	<code>\mfDatabaseAlt</code>		<code>\mfMobilePhoneAlt</code>		<code>\mfShell</code>
	<code>\mfDatabaseAlttwo</code>		<code>\mfMobilePhoneBroadcast</code>		<code>\mfSplatter</code>
	<code>\mfGhost</code>		<code>\mfPhoneAlt</code>		<code>\mfWireless</code>
	<code>\mfIphone</code>		<code>\mfPhoneGap</code>		

fontmfizz requires either  $\text{Lua}\text{L}\text{A}\text{T}\text{E}\text{X}$  or  $\text{X}\text{E}\text{L}\text{A}\text{T}\text{E}\text{X}$ .

TABLE 663: rubikcube Rubik’s Cube Rotations

	<code>\rrhD</code>		<code>\rrhF</code>		<code>\rrhLw</code>		<code>\rrhRw</code>		<code>\rrhU</code>
	<code>\rrhDa</code>		<code>\rrhFp</code>		<code>\rrhLwp</code>		<code>\rrhRwp</code>		<code>\rrhUa</code>
	<code>\rrhDap</code>		<code>\rrhFw</code>		<code>\rrhM</code>		<code>\rrhSd</code>		<code>\rrhUap</code>
	<code>\rrhDp</code>		<code>\rrhFwp</code>		<code>\rrhMp</code>		<code>\rrhSdp</code>		<code>\rrhUp</code>
	<code>\rrhDs</code>		<code>\rrhL</code>		<code>\rrhR</code>		<code>\rrhSl</code>		<code>\rrhUs</code>
	<code>\rrhDsp</code>		<code>\rrhLa</code>		<code>\rrhRa</code>		<code>\rrhSlp</code>		<code>\rrhUsp</code>
	<code>\rrhDw</code>		<code>\rrhLap</code>		<code>\rrhRap</code>		<code>\rrhSr</code>		<code>\rrhUw</code>
	<code>\rrhDwp</code>		<code>\rrhLp</code>		<code>\rrhRp</code>		<code>\rrhSrp</code>		<code>\rrhUwp</code>
	<code>\rrhE</code>		<code>\rrhLs</code>		<code>\rrhRs</code>		<code>\rrhSu</code>		
	<code>\rrhEp</code>		<code>\rrhLsp</code>		<code>\rrhRsp</code>		<code>\rrhSup</code>		























All rubikcube symbols are implemented with  $\text{TikZ}$  graphics, not with a font. In addition to the symbols shown above, the rubikcube package defines commands for combinations of textual and graphical representations of rotations (e.g., `\textRubikUa` produces “ $\text{Ua}$  ”) as well as commands that produce colored illustrations of Rubik’s Cube configurations and rotations. See the rubikcube documentation for more information.

TABLE 664: sacsymb Orchestrated Objective Reduction Symbols

	<code>\ca</code>		<code>\cd</code>		<code>\cg</code>		<code>\cj</code>		<code>\cm</code>		<code>\cq</code>		<code>\cu</code>
	<code>\cb</code>		<code>\ce</code>		<code>\ch</code>		<code>\ck</code>		<code>\cn</code>		<code>\cs</code>		<code>\cv</code>
	<code>\cc</code>		<code>\cf</code>		<code>\ci</code>		<code>\cl</code>		<code>\co</code>		<code>\ct</code>		<code>\cw</code>










All sacsymb symbols are implemented with  $\text{TikZ}$  graphics, not with a font.

TABLE 665: academicons Online Academic Profile Icons

	<code>\aiAcademia</code>		<code>\aiFigshare</code>		<code>\aiOrcid</code>
	<code>\aiAcademiaSquare</code>		<code>\aiFigshareSquare</code>		<code>\aiOrcidSquare</code>
	<code>\aiAcclaim</code>		<code>\aiGoogleScholar</code>		<code>\aiOSF</code>
	<code>\aiAcclaimSquare</code>		<code>\aiGoogleScholarSquare</code>		<code>\aiOSFSquare</code>
	<code>\aiACM</code>		<code>\aiHAL</code>		<code>\aiOverleaf</code>
	<code>\aiACMDL</code>		<code>\aiHALSquare</code>		<code>\aiOverleafSquare</code>
	<code>\aiACMDLSquare</code>		<code>\aiHypothesis</code>		<code>\aiPhilPapers</code>
	<code>\aiACMSquare</code>		<code>\aiHypothesisSquare</code>		<code>\aiPhilPapersSquare</code>
	<code>\aiADS</code>		<code>\aiIDEASRePEc</code>		<code>\aiPiazza</code>
	<code>\aiADSSquare</code>		<code>\aiIDEASRePEcSquare</code>		<code>\aiPiazzaSquare</code>
	<code>\aiAfricArXiv</code>		<code>\aiIEEE</code>		<code>\aiPreregistered</code>
	<code>\aiAfricArXivSquare</code>		<code>\aiIEEESquare</code>		<code>\aiPreregisteredSquare</code>
	<code>\aiArchive</code>		<code>\aiImpactstory</code>		<code>\aiProtocols</code>
	<code>\aiArchiveSquare</code>		<code>\aiImpactstorySquare</code>		<code>\aiProtocolsSquare</code>
	<code>\aiarXiv</code>		<code>\aiiNaturalist</code>		<code>\aiPsyArXiv</code>
	<code>\aiarXivSquare</code>		<code>\aiiNaturalistSquare</code>		<code>\aiPsyArXivSquare</code>
	<code>\aibioRxiv</code>		<code>\aiINPN</code>		<code>\aiPublons</code>
	<code>\aibioRxivSquare</code>		<code>\aiINPNSquare</code>		<code>\aiPublonsSquare</code>
	<code>\aiCEUR</code>		<code>\aiInspire</code>		<code>\aiPubMed</code>
	<code>\aiCEURSquare</code>		<code>\aiInspireSquare</code>		<code>\aiPubMedSquare</code>
	<code>\aiCIENCIAVITAE</code>		<code>\aiISIDORE</code>		<code>\aiPubPeer</code>
	<code>\aiCIENCIAVITAE Square</code>		<code>\aiISIDORE Square</code>		<code>\aiPubPeer Square</code>
	<code>\aiClosedAccess</code>		<code>\aiJSTOR</code>		<code>\aiResearcher ID</code>
	<code>\aiClosedAccess Square</code>		<code>\aiJSTOR Square</code>		<code>\aiResearcher ID Square</code>
	<code>\aiConversation</code>		<code>\aiLattes</code>		<code>\aiResearchGate</code>
	<code>\aiConversation Square</code>		<code>\aiLattes Square</code>		<code>\aiResearchGate Square</code>
	<code>\aiCoursera</code>		<code>\aiMathOverflow</code>		<code>\aiROR</code>
	<code>\aiCoursera Square</code>		<code>\aiMathOverflow Square</code>		<code>\aiROR Square</code>
	<code>\aiCrossref</code>		<code>\aiMendeley</code>		<code>\aiSciHub</code>
	<code>\aiCrossref Square</code>		<code>\aiMendeley Square</code>		<code>\aiSciHub Square</code>
	<code>\aiCV</code>		<code>\aiMoodle</code>		<code>\aiSciRate</code>
	<code>\aiCV Square</code>		<code>\aiMoodle Square</code>		<code>\aiSciRate Square</code>
	<code>\aiDataCite</code>		<code>\aiMTMT</code>		<code>\aiScopus</code>
	<code>\aiDataCite Square</code>		<code>\aiMTMT Square</code>		<code>\aiScopus Square</code>
	<code>\aiDataVerse</code>		<code>\aiNAKALA</code>		<code>\aiSemanticScholar</code>
	<code>\aiDataVerse Square</code>		<code>\aiNAKALA Square</code>		<code>\aiSemanticScholar Square</code>
	<code>\aidblp</code>		<code>\aiOBP</code>		<code>\aiSpringer</code>
	<code>\aidblp Square</code>		<code>\aiOBP Square</code>		<code>\aiSpringer Square</code>
	<code>\aiDepSy</code>		<code>\aiOpenAccess</code>		<code>\aiSSRN</code>
	<code>\aiDepSy Square</code>		<code>\aiOpenAccess Square</code>		<code>\aiSSRN Square</code>
	<code>\aiDoi</code>		<code>\aiOpenData</code>		<code>\aiStackOverflow</code>
	<code>\aiDoi Square</code>		<code>\aiOpenData Square</code>		<code>\aiStackOverflow Square</code>
	<code>\aiDryad</code>		<code>\aiOpenEdition</code>		<code>\aiZenodo</code>









*(continued on next page)*

(continued from previous page)

	<code>\aiDryadSquare</code>		<code>\aiOpenEditionSquare</code>		<code>\aiZenodoSquare</code>
	<code>\aiElsevier</code>		<code>\aiOpenMaterials</code>		<code>\aiZotero</code>
	<code>\aiElsevierquare</code>		<code>\aiOpenMaterialsSquare</code>		<code>\aiZoteroSquare</code>

academicons requires either Lua $\text{\LaTeX}$  or X $\text{\LaTeX}$ .

TABLE 666: Miscellaneous figchild Symbols

	<code>\fcAngel</code>		<code>\fcGhost</code>		<code>\fcPassB</code>
	<code>\fcEyebrows</code>		<code>\fcLoveLetter</code>		<code>\fcWitchHat</code>
	<code>\fcEyes</code>		<code>\fcPassA</code>		

All figchild symbols are implemented with TikZ graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

## Chapter 11

# Fonts with minimal L<sup>A</sup>T<sub>E</sub>X support

The symbol fonts shown in this chapter are provided without a corresponding L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> style file that assigns a convenient name to each glyph. Consequently, each glyph must be accessed by number. To help with this, the `pifont` package defines a `\Pisymbol` command that typesets a specified character by number from a specified L<sup>A</sup>T<sub>E</sub>X font family. Alas, most of the fonts in this chapter do not even define a L<sup>A</sup>T<sub>E</sub>X font family. Hence, except where otherwise specified, a document will need to include code like the following in its preamble:

```
\usepackage{pifont}
\DeclareFontFamily{U}{⟨name⟩}{}
\DeclareFontShape{U}{⟨name⟩}{m}{n}{<-> ⟨font⟩}{}
```

where *⟨font⟩* is the name of the `.tfm` font file (or `.mf` font file, from which a `.tfm` font file can be generated automatically), and *⟨name⟩* is a name to use to refer to that font. It's generally good practice to use the name of the font file for *⟨name⟩*, as in the following:

```
\usepackage{pifont}
\DeclareFontFamily{U}{hands}{}
\DeclareFontShape{U}{hands}{m}{n}{<-> hands}{}
```

TABLE 667: hands Fists





	<code>\Pisymbol{hands}{65}</code>		<code>\Pisymbol{hands}{67}</code>
	<code>\Pisymbol{hands}{66}</code>		<code>\Pisymbol{hands}{68}</code>

TABLE 668: greenpoint Recycling Symbols


 `\Pisymbol{greenpoint}{71}`

TABLE 669: nkarta Map Symbols

○	<code>\Pisymbol{nkarta}{33}</code>	⋈	<code>\Pisymbol{nkarta}{96}</code>	●	<code>\Pisymbol{nkarta}{193}</code>
⊕	<code>\Pisymbol{nkarta}{34}</code>	↖	<code>\Pisymbol{nkarta}{97}</code>	□	<code>\Pisymbol{nkarta}{194}</code>
△	<code>\Pisymbol{nkarta}{35}</code>	⚡	<code>\Pisymbol{nkarta}{98}</code>	⚡	<code>\Pisymbol{nkarta}{195}</code>
◇	<code>\Pisymbol{nkarta}{36}</code>	🌐	<code>\Pisymbol{nkarta}{99}</code>	🌀	<code>\Pisymbol{nkarta}{196}</code>
⊙	<code>\Pisymbol{nkarta}{37}</code>	▲	<code>\Pisymbol{nkarta}{100}</code>	⤵	<code>\Pisymbol{nkarta}{197}</code>
✦	<code>\Pisymbol{nkarta}{38}</code>	★	<code>\Pisymbol{nkarta}{101}</code>	✈	<code>\Pisymbol{nkarta}{198}</code>
⊙	<code>\Pisymbol{nkarta}{39}</code>	🏠	<code>\Pisymbol{nkarta}{102}</code>	↘	<code>\Pisymbol{nkarta}{199}</code>
l	<code>\Pisymbol{nkarta}{40}</code>	↑	<code>\Pisymbol{nkarta}{103}</code>	➔	<code>\Pisymbol{nkarta}{200}</code>
l	<code>\Pisymbol{nkarta}{41}</code>	↓	<code>\Pisymbol{nkarta}{104}</code>	△	<code>\Pisymbol{nkarta}{201}</code>
✦	<code>\Pisymbol{nkarta}{42}</code>	☰	<code>\Pisymbol{nkarta}{105}</code>	◆	<code>\Pisymbol{nkarta}{202}</code>
∴	<code>\Pisymbol{nkarta}{43}</code>	✈	<code>\Pisymbol{nkarta}{106}</code>	▣	<code>\Pisymbol{nkarta}{203}</code>
📎	<code>\Pisymbol{nkarta}{44}</code>	➤	<code>\Pisymbol{nkarta}{107}</code>	■	<code>\Pisymbol{nkarta}{204}</code>
⚡	<code>\Pisymbol{nkarta}{45}</code>	□	<code>\Pisymbol{nkarta}{108}</code>	●	<code>\Pisymbol{nkarta}{205}</code>
✕	<code>\Pisymbol{nkarta}{46}</code>	📄	<code>\Pisymbol{nkarta}{109}</code>	▣	<code>\Pisymbol{nkarta}{206}</code>
🌀	<code>\Pisymbol{nkarta}{47}</code>	🌀	<code>\Pisymbol{nkarta}{110}</code>	🏠	<code>\Pisymbol{nkarta}{207}</code>
0	<code>\Pisymbol{nkarta}{48}</code>	○	<code>\Pisymbol{nkarta}{111}</code>	✕	<code>\Pisymbol{nkarta}{208}</code>
1	<code>\Pisymbol{nkarta}{49}</code>	◇	<code>\Pisymbol{nkarta}{112}</code>	⤵	<code>\Pisymbol{nkarta}{209}</code>
2	<code>\Pisymbol{nkarta}{50}</code>	🏠	<code>\Pisymbol{nkarta}{113}</code>	↙	<code>\Pisymbol{nkarta}{210}</code>
3	<code>\Pisymbol{nkarta}{51}</code>	🌀	<code>\Pisymbol{nkarta}{114}</code>	←	<code>\Pisymbol{nkarta}{211}</code>
4	<code>\Pisymbol{nkarta}{52}</code>	👤	<code>\Pisymbol{nkarta}{115}</code>	↓	<code>\Pisymbol{nkarta}{212}</code>
5	<code>\Pisymbol{nkarta}{53}</code>	●	<code>\Pisymbol{nkarta}{116}</code>	↑	<code>\Pisymbol{nkarta}{213}</code>
6	<code>\Pisymbol{nkarta}{54}</code>	☰	<code>\Pisymbol{nkarta}{117}</code>	↖	<code>\Pisymbol{nkarta}{214}</code>
7	<code>\Pisymbol{nkarta}{55}</code>	🏠	<code>\Pisymbol{nkarta}{118}</code>	⚡	<code>\Pisymbol{nkarta}{215}</code>
8	<code>\Pisymbol{nkarta}{56}</code>	🏠	<code>\Pisymbol{nkarta}{119}</code>	●	<code>\Pisymbol{nkarta}{216}</code>
9	<code>\Pisymbol{nkarta}{57}</code>	⊙	<code>\Pisymbol{nkarta}{120}</code>	🏠	<code>\Pisymbol{nkarta}{217}</code>
□	<code>\Pisymbol{nkarta}{58}</code>	☰	<code>\Pisymbol{nkarta}{121}</code>	●	<code>\Pisymbol{nkarta}{218}</code>
⊙	<code>\Pisymbol{nkarta}{59}</code>	i	<code>\Pisymbol{nkarta}{122}</code>	🏠	<code>\Pisymbol{nkarta}{219}</code>
○	<code>\Pisymbol{nkarta}{60}</code>	⤵	<code>\Pisymbol{nkarta}{123}</code>	■	<code>\Pisymbol{nkarta}{220}</code>
▮	<code>\Pisymbol{nkarta}{61}</code>	↗	<code>\Pisymbol{nkarta}{124}</code>	●	<code>\Pisymbol{nkarta}{221}</code>
✕	<code>\Pisymbol{nkarta}{62}</code>	↖	<code>\Pisymbol{nkarta}{125}</code>	🏠	<code>\Pisymbol{nkarta}{222}</code>
▮	<code>\Pisymbol{nkarta}{63}</code>	🏠	<code>\Pisymbol{nkarta}{126}</code>	🏠	<code>\Pisymbol{nkarta}{223}</code>
□	<code>\Pisymbol{nkarta}{64}</code>	🏠	<code>\Pisymbol{nkarta}{161}</code>	■	<code>\Pisymbol{nkarta}{224}</code>
✦	<code>\Pisymbol{nkarta}{65}</code>	◆	<code>\Pisymbol{nkarta}{162}</code>	🏠	<code>\Pisymbol{nkarta}{225}</code>
⚡	<code>\Pisymbol{nkarta}{66}</code>	▲	<code>\Pisymbol{nkarta}{163}</code>	🏠	<code>\Pisymbol{nkarta}{226}</code>
🏠	<code>\Pisymbol{nkarta}{67}</code>	⤵	<code>\Pisymbol{nkarta}{164}</code>	●	<code>\Pisymbol{nkarta}{227}</code>
▲	<code>\Pisymbol{nkarta}{68}</code>	⤵	<code>\Pisymbol{nkarta}{165}</code>	★	<code>\Pisymbol{nkarta}{228}</code>
☆	<code>\Pisymbol{nkarta}{69}</code>	🏠	<code>\Pisymbol{nkarta}{166}</code>	☆	<code>\Pisymbol{nkarta}{229}</code>
🏠	<code>\Pisymbol{nkarta}{70}</code>	🏠	<code>\Pisymbol{nkarta}{167}</code>	○	<code>\Pisymbol{nkarta}{230}</code>
▮	<code>\Pisymbol{nkarta}{71}</code>	⊙	<code>\Pisymbol{nkarta}{168}</code>	☰	<code>\Pisymbol{nkarta}{231}</code>
🏠	<code>\Pisymbol{nkarta}{72}</code>	▲	<code>\Pisymbol{nkarta}{169}</code>	🏠	<code>\Pisymbol{nkarta}{232}</code>
🏠	<code>\Pisymbol{nkarta}{73}</code>	■	<code>\Pisymbol{nkarta}{170}</code>	🏠	<code>\Pisymbol{nkarta}{233}</code>

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	<code>\Pisymbol{nkarta}{74}</code>		<code>\Pisymbol{nkarta}{171}</code>		<code>\Pisymbol{nkarta}{234}</code>
	<code>\Pisymbol{nkarta}{75}</code>		<code>\Pisymbol{nkarta}{172}</code>		<code>\Pisymbol{nkarta}{235}</code>
	<code>\Pisymbol{nkarta}{76}</code>		<code>\Pisymbol{nkarta}{173}</code>		<code>\Pisymbol{nkarta}{236}</code>
	<code>\Pisymbol{nkarta}{77}</code>		<code>\Pisymbol{nkarta}{174}</code>		<code>\Pisymbol{nkarta}{237}</code>
	<code>\Pisymbol{nkarta}{78}</code>		<code>\Pisymbol{nkarta}{175}</code>		<code>\Pisymbol{nkarta}{238}</code>
	<code>\Pisymbol{nkarta}{79}</code>		<code>\Pisymbol{nkarta}{176}</code>		<code>\Pisymbol{nkarta}{239}</code>
	<code>\Pisymbol{nkarta}{80}</code>		<code>\Pisymbol{nkarta}{177}</code>		<code>\Pisymbol{nkarta}{240}</code>
	<code>\Pisymbol{nkarta}{81}</code>		<code>\Pisymbol{nkarta}{178}</code>		<code>\Pisymbol{nkarta}{241}</code>
	<code>\Pisymbol{nkarta}{82}</code>		<code>\Pisymbol{nkarta}{179}</code>		<code>\Pisymbol{nkarta}{242}</code>
	<code>\Pisymbol{nkarta}{83}</code>		<code>\Pisymbol{nkarta}{180}</code>		<code>\Pisymbol{nkarta}{243}</code>
	<code>\Pisymbol{nkarta}{84}</code>		<code>\Pisymbol{nkarta}{181}</code>		<code>\Pisymbol{nkarta}{244}</code>
	<code>\Pisymbol{nkarta}{85}</code>		<code>\Pisymbol{nkarta}{182}</code>		<code>\Pisymbol{nkarta}{245}</code>
	<code>\Pisymbol{nkarta}{86}</code>		<code>\Pisymbol{nkarta}{183}</code>		<code>\Pisymbol{nkarta}{246}</code>
	<code>\Pisymbol{nkarta}{87}</code>		<code>\Pisymbol{nkarta}{184}</code>		<code>\Pisymbol{nkarta}{247}</code>
	<code>\Pisymbol{nkarta}{88}</code>		<code>\Pisymbol{nkarta}{185}</code>		<code>\Pisymbol{nkarta}{248}</code>
	<code>\Pisymbol{nkarta}{89}</code>		<code>\Pisymbol{nkarta}{186}</code>		<code>\Pisymbol{nkarta}{249}</code>
	<code>\Pisymbol{nkarta}{90}</code>		<code>\Pisymbol{nkarta}{187}</code>		<code>\Pisymbol{nkarta}{250}</code>
	<code>\Pisymbol{nkarta}{91}</code>		<code>\Pisymbol{nkarta}{188}</code>		<code>\Pisymbol{nkarta}{251}</code>
	<code>\Pisymbol{nkarta}{92}</code>		<code>\Pisymbol{nkarta}{189}</code>		<code>\Pisymbol{nkarta}{252}</code>
	<code>\Pisymbol{nkarta}{93}</code>		<code>\Pisymbol{nkarta}{190}</code>		<code>\Pisymbol{nkarta}{253}</code>
	<code>\Pisymbol{nkarta}{94}</code>		<code>\Pisymbol{nkarta}{191}</code>		<code>\Pisymbol{nkarta}{254}</code>
	<code>\Pisymbol{nkarta}{95}</code>		<code>\Pisymbol{nkarta}{192}</code>		

TABLE 670: moonphase Astronomical Symbols







































































	<code>\Pisymbol{moonphase}{0}</code>		<code>\Pisymbol{moonphase}{2}</code>
	<code>\Pisymbol{moonphase}{1}</code>		<code>\Pisymbol{moonphase}{3}</code>



TABLE 671: astrosym Astronomical Symbols

	<code>\Pisymbol{astrosym}{0}</code>		<code>\Pisymbol{astrosym}{132}</code>
	<code>\Pisymbol{astrosym}{1}</code>		<code>\Pisymbol{astrosym}{133}</code>
	<code>\Pisymbol{astrosym}{2}</code>		<code>\Pisymbol{astrosym}{134}</code>
	<code>\Pisymbol{astrosym}{3}</code>		<code>\Pisymbol{astrosym}{135}</code>
	<code>\Pisymbol{astrosym}{4}</code>		<code>\Pisymbol{astrosym}{136}</code>
	<code>\Pisymbol{astrosym}{5}</code>		<code>\Pisymbol{astrosym}{137}</code>
	<code>\Pisymbol{astrosym}{6}</code>		<code>\Pisymbol{astrosym}{138}</code>
	<code>\Pisymbol{astrosym}{7}</code>		<code>\Pisymbol{astrosym}{139}</code>
	<code>\Pisymbol{astrosym}{8}</code>		<code>\Pisymbol{astrosym}{140}</code>
	<code>\Pisymbol{astrosym}{9}</code>		<code>\Pisymbol{astrosym}{141}</code>
	<code>\Pisymbol{astrosym}{10}</code>		<code>\Pisymbol{astrosym}{142}</code>
	<code>\Pisymbol{astrosym}{11}</code>		<code>\Pisymbol{astrosym}{143}</code>
	<code>\Pisymbol{astrosym}{12}</code>		<code>\Pisymbol{astrosym}{144}</code>
	<code>\Pisymbol{astrosym}{13}</code>		<code>\Pisymbol{astrosym}{145}</code>
	<code>\Pisymbol{astrosym}{14}</code>		<code>\Pisymbol{astrosym}{146}</code>
	<code>\Pisymbol{astrosym}{15}</code>		<code>\Pisymbol{astrosym}{147}</code>
	<code>\Pisymbol{astrosym}{16}</code>		<code>\Pisymbol{astrosym}{148}</code>
	<code>\Pisymbol{astrosym}{17}</code>		<code>\Pisymbol{astrosym}{149}</code>
	<code>\Pisymbol{astrosym}{18}</code>		<code>\Pisymbol{astrosym}{150}</code>
	<code>\Pisymbol{astrosym}{19}</code>		<code>\Pisymbol{astrosym}{151}</code>
	<code>\Pisymbol{astrosym}{20}</code>		<code>\Pisymbol{astrosym}{152}</code>
	<code>\Pisymbol{astrosym}{21}</code>		<code>\Pisymbol{astrosym}{153}</code>
	<code>\Pisymbol{astrosym}{22}</code>		<code>\Pisymbol{astrosym}{154}</code>
	<code>\Pisymbol{astrosym}{23}</code>		<code>\Pisymbol{astrosym}{155}</code>
	<code>\Pisymbol{astrosym}{24}</code>		<code>\Pisymbol{astrosym}{156}</code>
	<code>\Pisymbol{astrosym}{25}</code>		<code>\Pisymbol{astrosym}{157}</code>
	<code>\Pisymbol{astrosym}{26}</code>		<code>\Pisymbol{astrosym}{158}</code>
	<code>\Pisymbol{astrosym}{27}</code>		<code>\Pisymbol{astrosym}{159}</code>
	<code>\Pisymbol{astrosym}{28}</code>		<code>\Pisymbol{astrosym}{160}</code>
	<code>\Pisymbol{astrosym}{29}</code>		<code>\Pisymbol{astrosym}{161}</code>
	<code>\Pisymbol{astrosym}{30}</code>		<code>\Pisymbol{astrosym}{162}</code>
	<code>\Pisymbol{astrosym}{31}</code>		<code>\Pisymbol{astrosym}{163}</code>
	<code>\Pisymbol{astrosym}{32}</code>		<code>\Pisymbol{astrosym}{164}</code>

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*	<code>\Pisymbol{astroSYM}{33}</code>	♁	<code>\Pisymbol{astroSYM}{165}</code>
♁	<code>\Pisymbol{astroSYM}{34}</code>	♂	<code>\Pisymbol{astroSYM}{166}</code>
♂	<code>\Pisymbol{astroSYM}{35}</code>	♃	<code>\Pisymbol{astroSYM}{167}</code>
♃	<code>\Pisymbol{astroSYM}{36}</code>	♆	<code>\Pisymbol{astroSYM}{168}</code>
♆	<code>\Pisymbol{astroSYM}{37}</code>	♁	<code>\Pisymbol{astroSYM}{169}</code>
♁	<code>\Pisymbol{astroSYM}{38}</code>	♃	<code>\Pisymbol{astroSYM}{178}</code>
♃	<code>\Pisymbol{astroSYM}{39}</code>	♂	<code>\Pisymbol{astroSYM}{179}</code>
♂	<code>\Pisymbol{astroSYM}{40}</code>	♃	<code>\Pisymbol{astroSYM}{180}</code>
♃	<code>\Pisymbol{astroSYM}{41}</code>	♁	<code>\Pisymbol{astroSYM}{181}</code>
♁	<code>\Pisymbol{astroSYM}{42}</code>	♁	<code>\Pisymbol{astroSYM}{182}</code>
♁	<code>\Pisymbol{astroSYM}{43}</code>	♂	<code>\Pisymbol{astroSYM}{183}</code>
♁	<code>\Pisymbol{astroSYM}{44}</code>	♁	<code>\Pisymbol{astroSYM}{184}</code>
♁	<code>\Pisymbol{astroSYM}{45}</code>	♂	<code>\Pisymbol{astroSYM}{185}</code>
♁	<code>\Pisymbol{astroSYM}{46}</code>	♁	<code>\Pisymbol{astroSYM}{186}</code>
♁	<code>\Pisymbol{astroSYM}{47}</code>	♁	<code>\Pisymbol{astroSYM}{187}</code>
♁	<code>\Pisymbol{astroSYM}{48}</code>	♂	<code>\Pisymbol{astroSYM}{188}</code>
♁	<code>\Pisymbol{astroSYM}{49}</code>	♃	<code>\Pisymbol{astroSYM}{189}</code>
♁	<code>\Pisymbol{astroSYM}{50}</code>	♆	<code>\Pisymbol{astroSYM}{190}</code>
♁	<code>\Pisymbol{astroSYM}{51}</code>	♁	<code>\Pisymbol{astroSYM}{191}</code>
♁	<code>\Pisymbol{astroSYM}{52}</code>	♂	<code>\Pisymbol{astroSYM}{200}</code>
♁	<code>\Pisymbol{astroSYM}{53}</code>	♆	<code>\Pisymbol{astroSYM}{201}</code>
♁	<code>\Pisymbol{astroSYM}{54}</code>	♆	<code>\Pisymbol{astroSYM}{202}</code>
♁	<code>\Pisymbol{astroSYM}{55}</code>	♁	<code>\Pisymbol{astroSYM}{203}</code>
♁	<code>\Pisymbol{astroSYM}{56}</code>	♂	<code>\Pisymbol{astroSYM}{204}</code>
♁	<code>\Pisymbol{astroSYM}{57}</code>	♂	<code>\Pisymbol{astroSYM}{205}</code>
♁	<code>\Pisymbol{astroSYM}{58}</code>	♂	<code>\Pisymbol{astroSYM}{206}</code>
♁	<code>\Pisymbol{astroSYM}{59}</code>	♂	<code>\Pisymbol{astroSYM}{207}</code>
♁	<code>\Pisymbol{astroSYM}{60}</code>	♂	<code>\Pisymbol{astroSYM}{208}</code>
♁	<code>\Pisymbol{astroSYM}{61}</code>	♂	<code>\Pisymbol{astroSYM}{209}</code>
♁	<code>\Pisymbol{astroSYM}{62}</code>	♂	<code>\Pisymbol{astroSYM}{210}</code>
♁	<code>\Pisymbol{astroSYM}{63}</code>	♂	<code>\Pisymbol{astroSYM}{211}</code>
♁	<code>\Pisymbol{astroSYM}{64}</code>	♂	<code>\Pisymbol{astroSYM}{212}</code>
♁	<code>\Pisymbol{astroSYM}{65}</code>	♂	<code>\Pisymbol{astroSYM}{213}</code>
♁	<code>\Pisymbol{astroSYM}{66}</code>	♂	<code>\Pisymbol{astroSYM}{214}</code>
♁	<code>\Pisymbol{astroSYM}{67}</code>	♂	<code>\Pisymbol{astroSYM}{215}</code>

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	<code>\Pisymbol{astroSYM}{68}</code>		<code>\Pisymbol{astroSYM}{216}</code>
	<code>\Pisymbol{astroSYM}{69}</code>		<code>\Pisymbol{astroSYM}{217}</code>
	<code>\Pisymbol{astroSYM}{90}</code>		<code>\Pisymbol{astroSYM}{218}</code>
	<code>\Pisymbol{astroSYM}{91}</code>		<code>\Pisymbol{astroSYM}{219}</code>
	<code>\Pisymbol{astroSYM}{92}</code>		<code>\Pisymbol{astroSYM}{220}</code>
	<code>\Pisymbol{astroSYM}{93}</code>		<code>\Pisymbol{astroSYM}{221}</code>
	<code>\Pisymbol{astroSYM}{94}</code>		<code>\Pisymbol{astroSYM}{222}</code>
	<code>\Pisymbol{astroSYM}{95}</code>		<code>\Pisymbol{astroSYM}{223}</code>
	<code>\Pisymbol{astroSYM}{100}</code>		<code>\Pisymbol{astroSYM}{224}</code>
	<code>\Pisymbol{astroSYM}{101}</code>		<code>\Pisymbol{astroSYM}{225}</code>
	<code>\Pisymbol{astroSYM}{102}</code>		<code>\Pisymbol{astroSYM}{226}</code>
	<code>\Pisymbol{astroSYM}{103}</code>		<code>\Pisymbol{astroSYM}{227}</code>
	<code>\Pisymbol{astroSYM}{104}</code>		<code>\Pisymbol{astroSYM}{228}</code>
	<code>\Pisymbol{astroSYM}{105}</code>		<code>\Pisymbol{astroSYM}{229}</code>
	<code>\Pisymbol{astroSYM}{106}</code>		<code>\Pisymbol{astroSYM}{230}</code>
	<code>\Pisymbol{astroSYM}{107}</code>		<code>\Pisymbol{astroSYM}{231}</code>
	<code>\Pisymbol{astroSYM}{108}</code>		<code>\Pisymbol{astroSYM}{232}</code>
	<code>\Pisymbol{astroSYM}{109}</code>		<code>\Pisymbol{astroSYM}{233}</code>
	<code>\Pisymbol{astroSYM}{110}</code>		<code>\Pisymbol{astroSYM}{234}</code>
	<code>\Pisymbol{astroSYM}{111}</code>		<code>\Pisymbol{astroSYM}{235}</code>
	<code>\Pisymbol{astroSYM}{112}</code>		<code>\Pisymbol{astroSYM}{236}</code>
	<code>\Pisymbol{astroSYM}{113}</code>		<code>\Pisymbol{astroSYM}{237}</code>
	<code>\Pisymbol{astroSYM}{114}</code>		<code>\Pisymbol{astroSYM}{238}</code>
	<code>\Pisymbol{astroSYM}{115}</code>		<code>\Pisymbol{astroSYM}{239}</code>
	<code>\Pisymbol{astroSYM}{116}</code>		<code>\Pisymbol{astroSYM}{240}</code>
	<code>\Pisymbol{astroSYM}{117}</code>		<code>\Pisymbol{astroSYM}{241}</code>
	<code>\Pisymbol{astroSYM}{118}</code>		<code>\Pisymbol{astroSYM}{242}</code>
	<code>\Pisymbol{astroSYM}{119}</code>		<code>\Pisymbol{astroSYM}{243}</code>
	<code>\Pisymbol{astroSYM}{120}</code>		<code>\Pisymbol{astroSYM}{244}</code>
	<code>\Pisymbol{astroSYM}{121}</code>		<code>\Pisymbol{astroSYM}{245}</code>
	<code>\Pisymbol{astroSYM}{122}</code>		<code>\Pisymbol{astroSYM}{246}</code>
	<code>\Pisymbol{astroSYM}{123}</code>		<code>\Pisymbol{astroSYM}{247}</code>
	<code>\Pisymbol{astroSYM}{124}</code>		<code>\Pisymbol{astroSYM}{248}</code>
	<code>\Pisymbol{astroSYM}{125}</code>		<code>\Pisymbol{astroSYM}{249}</code>
	<code>\Pisymbol{astroSYM}{126}</code>		<code>\Pisymbol{astroSYM}{250}</code>
	<code>\Pisymbol{astroSYM}{127}</code>		<code>\Pisymbol{astroSYM}{251}</code>

*(continued on next page)*

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	<code>\Pisymbol{astroSYM}{128}</code>		<code>\Pisymbol{astroSYM}{252}</code>
	<code>\Pisymbol{astroSYM}{129}</code>		<code>\Pisymbol{astroSYM}{253}</code>
	<code>\Pisymbol{astroSYM}{130}</code>		<code>\Pisymbol{astroSYM}{254}</code>
	<code>\Pisymbol{astroSYM}{131}</code>		<code>\Pisymbol{astroSYM}{255}</code>


TABLE 672: webomints Decorative Borders

	<code>\Pisymbol{WebOMintsGD}{47}</code>		<code>\Pisymbol{WebOMintsGD}{87}</code>
	<code>\Pisymbol{WebOMintsGD}{48}</code>		<code>\Pisymbol{WebOMintsGD}{88}</code>
	<code>\Pisymbol{WebOMintsGD}{49}</code>		<code>\Pisymbol{WebOMintsGD}{89}</code>
	<code>\Pisymbol{WebOMintsGD}{50}</code>		<code>\Pisymbol{WebOMintsGD}{90}</code>
	<code>\Pisymbol{WebOMintsGD}{51}</code>		<code>\Pisymbol{WebOMintsGD}{91}</code>
	<code>\Pisymbol{WebOMintsGD}{52}</code>		<code>\Pisymbol{WebOMintsGD}{93}</code>
	<code>\Pisymbol{WebOMintsGD}{53}</code>		<code>\Pisymbol{WebOMintsGD}{97}</code>
	<code>\Pisymbol{WebOMintsGD}{54}</code>		<code>\Pisymbol{WebOMintsGD}{98}</code>
	<code>\Pisymbol{WebOMintsGD}{55}</code>		<code>\Pisymbol{WebOMintsGD}{99}</code>
	<code>\Pisymbol{WebOMintsGD}{56}</code>		<code>\Pisymbol{WebOMintsGD}{100}</code>
	<code>\Pisymbol{WebOMintsGD}{57}</code>		<code>\Pisymbol{WebOMintsGD}{101}</code>
	<code>\Pisymbol{WebOMintsGD}{65}</code>		<code>\Pisymbol{WebOMintsGD}{102}</code>
	<code>\Pisymbol{WebOMintsGD}{66}</code>		<code>\Pisymbol{WebOMintsGD}{103}</code>
	<code>\Pisymbol{WebOMintsGD}{67}</code>		<code>\Pisymbol{WebOMintsGD}{104}</code>
	<code>\Pisymbol{WebOMintsGD}{68}</code>		<code>\Pisymbol{WebOMintsGD}{105}</code>
	<code>\Pisymbol{WebOMintsGD}{69}</code>		<code>\Pisymbol{WebOMintsGD}{106}</code>
	<code>\Pisymbol{WebOMintsGD}{70}</code>		<code>\Pisymbol{WebOMintsGD}{107}</code>
	<code>\Pisymbol{WebOMintsGD}{71}</code>		<code>\Pisymbol{WebOMintsGD}{108}</code>
	<code>\Pisymbol{WebOMintsGD}{72}</code>		<code>\Pisymbol{WebOMintsGD}{109}</code>
	<code>\Pisymbol{WebOMintsGD}{73}</code>		<code>\Pisymbol{WebOMintsGD}{110}</code>
	<code>\Pisymbol{WebOMintsGD}{74}</code>		<code>\Pisymbol{WebOMintsGD}{111}</code>
	<code>\Pisymbol{WebOMintsGD}{75}</code>		<code>\Pisymbol{WebOMintsGD}{112}</code>
	<code>\Pisymbol{WebOMintsGD}{76}</code>		<code>\Pisymbol{WebOMintsGD}{113}</code>
	<code>\Pisymbol{WebOMintsGD}{77}</code>		<code>\Pisymbol{WebOMintsGD}{114}</code>
	<code>\Pisymbol{WebOMintsGD}{78}</code>		<code>\Pisymbol{WebOMintsGD}{115}</code>
	<code>\Pisymbol{WebOMintsGD}{79}</code>		<code>\Pisymbol{WebOMintsGD}{116}</code>
	<code>\Pisymbol{WebOMintsGD}{80}</code>		<code>\Pisymbol{WebOMintsGD}{117}</code>
	<code>\Pisymbol{WebOMintsGD}{81}</code>		<code>\Pisymbol{WebOMintsGD}{118}</code>
	<code>\Pisymbol{WebOMintsGD}{82}</code>		<code>\Pisymbol{WebOMintsGD}{119}</code>

(continued on next page)




















































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	<code>\Pisymbol{WebOMintsGD}{83}</code>		<code>\Pisymbol{WebOMintsGD}{120}</code>
	<code>\Pisymbol{WebOMintsGD}{84}</code>		<code>\Pisymbol{WebOMintsGD}{121}</code>
	<code>\Pisymbol{WebOMintsGD}{85}</code>		<code>\Pisymbol{WebOMintsGD}{122}</code>
	<code>\Pisymbol{WebOMintsGD}{86}</code>		

webomints provides a `uwebo.fd` font-definition file. Instead of using `pifont` and `\Pisymbol` to typeset a glyph, a document can select the `webomints` font directly. For example, `{\usefont{U}{webo}{xl}{n}\char73\char74}`—alternatively, `{\usefont{U}{webo}{xl}{n}IJ}`—will typeset “”. This can be useful for typesetting a number of `webomints` glyphs in a row.




















































The `niceframe` package can be used to typeset decorative frames using fonts such as `webomints`.

TABLE 673: `umranda` Decorative Borders

	<code>\Pisymbol{umranda}{0}</code>		<code>\Pisymbol{umranda}{34}</code>		<code>\Pisymbol{umranda}{68}</code>
	<code>\Pisymbol{umranda}{1}</code>		<code>\Pisymbol{umranda}{35}</code>		<code>\Pisymbol{umranda}{69}</code>
	<code>\Pisymbol{umranda}{2}</code>		<code>\Pisymbol{umranda}{36}</code>		<code>\Pisymbol{umranda}{70}</code>
	<code>\Pisymbol{umranda}{3}</code>		<code>\Pisymbol{umranda}{37}</code>		<code>\Pisymbol{umranda}{71}</code>
	<code>\Pisymbol{umranda}{4}</code>		<code>\Pisymbol{umranda}{38}</code>		<code>\Pisymbol{umranda}{72}</code>
	<code>\Pisymbol{umranda}{5}</code>		<code>\Pisymbol{umranda}{39}</code>		<code>\Pisymbol{umranda}{73}</code>
	<code>\Pisymbol{umranda}{6}</code>		<code>\Pisymbol{umranda}{40}</code>		<code>\Pisymbol{umranda}{74}</code>
	<code>\Pisymbol{umranda}{7}</code>		<code>\Pisymbol{umranda}{41}</code>		<code>\Pisymbol{umranda}{75}</code>
	<code>\Pisymbol{umranda}{8}</code>		<code>\Pisymbol{umranda}{42}</code>		<code>\Pisymbol{umranda}{76}</code>
	<code>\Pisymbol{umranda}{9}</code>		<code>\Pisymbol{umranda}{43}</code>		<code>\Pisymbol{umranda}{77}</code>
	<code>\Pisymbol{umranda}{10}</code>		<code>\Pisymbol{umranda}{44}</code>		<code>\Pisymbol{umranda}{78}</code>
	<code>\Pisymbol{umranda}{11}</code>		<code>\Pisymbol{umranda}{45}</code>		<code>\Pisymbol{umranda}{79}</code>
	<code>\Pisymbol{umranda}{12}</code>		<code>\Pisymbol{umranda}{46}</code>		<code>\Pisymbol{umranda}{80}</code>
	<code>\Pisymbol{umranda}{13}</code>		<code>\Pisymbol{umranda}{47}</code>		<code>\Pisymbol{umranda}{81}</code>
	<code>\Pisymbol{umranda}{14}</code>		<code>\Pisymbol{umranda}{48}</code>		<code>\Pisymbol{umranda}{82}</code>
	<code>\Pisymbol{umranda}{15}</code>		<code>\Pisymbol{umranda}{49}</code>		<code>\Pisymbol{umranda}{83}</code>
	<code>\Pisymbol{umranda}{16}</code>		<code>\Pisymbol{umranda}{50}</code>		<code>\Pisymbol{umranda}{84}</code>




























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	<code>\Pisymbol{umranda}{17}</code>		<code>\Pisymbol{umranda}{51}</code>		<code>\Pisymbol{umranda}{85}</code>
	<code>\Pisymbol{umranda}{18}</code>		<code>\Pisymbol{umranda}{52}</code>		<code>\Pisymbol{umranda}{86}</code>
	<code>\Pisymbol{umranda}{19}</code>		<code>\Pisymbol{umranda}{53}</code>		<code>\Pisymbol{umranda}{87}</code>
	<code>\Pisymbol{umranda}{20}</code>		<code>\Pisymbol{umranda}{54}</code>		<code>\Pisymbol{umranda}{88}</code>
	<code>\Pisymbol{umranda}{21}</code>		<code>\Pisymbol{umranda}{55}</code>		<code>\Pisymbol{umranda}{89}</code>
	<code>\Pisymbol{umranda}{22}</code>		<code>\Pisymbol{umranda}{56}</code>		<code>\Pisymbol{umranda}{90}</code>
	<code>\Pisymbol{umranda}{23}</code>		<code>\Pisymbol{umranda}{57}</code>		<code>\Pisymbol{umranda}{91}</code>
	<code>\Pisymbol{umranda}{24}</code>		<code>\Pisymbol{umranda}{58}</code>		<code>\Pisymbol{umranda}{92}</code>
	<code>\Pisymbol{umranda}{25}</code>		<code>\Pisymbol{umranda}{59}</code>		<code>\Pisymbol{umranda}{93}</code>
	<code>\Pisymbol{umranda}{26}</code>		<code>\Pisymbol{umranda}{60}</code>		<code>\Pisymbol{umranda}{94}</code>
	<code>\Pisymbol{umranda}{27}</code>		<code>\Pisymbol{umranda}{61}</code>		<code>\Pisymbol{umranda}{95}</code>
	<code>\Pisymbol{umranda}{28}</code>		<code>\Pisymbol{umranda}{62}</code>		<code>\Pisymbol{umranda}{96}</code>
	<code>\Pisymbol{umranda}{29}</code>		<code>\Pisymbol{umranda}{63}</code>		<code>\Pisymbol{umranda}{97}</code>
	<code>\Pisymbol{umranda}{30}</code>		<code>\Pisymbol{umranda}{64}</code>		<code>\Pisymbol{umranda}{98}</code>
	<code>\Pisymbol{umranda}{31}</code>		<code>\Pisymbol{umranda}{65}</code>		<code>\Pisymbol{umranda}{99}</code>
	<code>\Pisymbol{umranda}{32}</code>		<code>\Pisymbol{umranda}{66}</code>		<code>\Pisymbol{umranda}{100}</code>
	<code>\Pisymbol{umranda}{33}</code>		<code>\Pisymbol{umranda}{67}</code>		<code>\Pisymbol{umranda}{101}</code>

The niceframe package can be used to typeset decorative frames using fonts such as umranda.

TABLE 674: umrandb Decorative Borders

	<code>\Pisymbol{umrandb}{0}</code>		<code>\Pisymbol{umrandb}{42}</code>		<code>\Pisymbol{umrandb}{84}</code>
	<code>\Pisymbol{umrandb}{1}</code>		<code>\Pisymbol{umrandb}{43}</code>		<code>\Pisymbol{umrandb}{85}</code>
	<code>\Pisymbol{umrandb}{2}</code>		<code>\Pisymbol{umrandb}{44}</code>		<code>\Pisymbol{umrandb}{86}</code>
	<code>\Pisymbol{umrandb}{3}</code>		<code>\Pisymbol{umrandb}{45}</code>		<code>\Pisymbol{umrandb}{87}</code>
	<code>\Pisymbol{umrandb}{4}</code>		<code>\Pisymbol{umrandb}{46}</code>		<code>\Pisymbol{umrandb}{88}</code>
	<code>\Pisymbol{umrandb}{5}</code>		<code>\Pisymbol{umrandb}{47}</code>		<code>\Pisymbol{umrandb}{89}</code>
	<code>\Pisymbol{umrandb}{6}</code>		<code>\Pisymbol{umrandb}{48}</code>		<code>\Pisymbol{umrandb}{90}</code>
	<code>\Pisymbol{umrandb}{7}</code>		<code>\Pisymbol{umrandb}{49}</code>		<code>\Pisymbol{umrandb}{91}</code>
	<code>\Pisymbol{umrandb}{8}</code>		<code>\Pisymbol{umrandb}{50}</code>		<code>\Pisymbol{umrandb}{92}</code>

















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	<code>\Pisymbol{umrandb}{9}</code>		<code>\Pisymbol{umrandb}{51}</code>		<code>\Pisymbol{umrandb}{93}</code>
	<code>\Pisymbol{umrandb}{10}</code>		<code>\Pisymbol{umrandb}{52}</code>		<code>\Pisymbol{umrandb}{94}</code>
	<code>\Pisymbol{umrandb}{11}</code>		<code>\Pisymbol{umrandb}{53}</code>		<code>\Pisymbol{umrandb}{95}</code>
	<code>\Pisymbol{umrandb}{12}</code>		<code>\Pisymbol{umrandb}{54}</code>		<code>\Pisymbol{umrandb}{96}</code>
	<code>\Pisymbol{umrandb}{13}</code>		<code>\Pisymbol{umrandb}{55}</code>		<code>\Pisymbol{umrandb}{97}</code>
	<code>\Pisymbol{umrandb}{14}</code>		<code>\Pisymbol{umrandb}{56}</code>		<code>\Pisymbol{umrandb}{98}</code>
	<code>\Pisymbol{umrandb}{15}</code>		<code>\Pisymbol{umrandb}{57}</code>		<code>\Pisymbol{umrandb}{99}</code>
	<code>\Pisymbol{umrandb}{16}</code>		<code>\Pisymbol{umrandb}{58}</code>		<code>\Pisymbol{umrandb}{100}</code>
	<code>\Pisymbol{umrandb}{17}</code>		<code>\Pisymbol{umrandb}{59}</code>		<code>\Pisymbol{umrandb}{101}</code>
	<code>\Pisymbol{umrandb}{18}</code>		<code>\Pisymbol{umrandb}{60}</code>		<code>\Pisymbol{umrandb}{102}</code>
	<code>\Pisymbol{umrandb}{19}</code>		<code>\Pisymbol{umrandb}{61}</code>		<code>\Pisymbol{umrandb}{103}</code>
	<code>\Pisymbol{umrandb}{20}</code>		<code>\Pisymbol{umrandb}{62}</code>		<code>\Pisymbol{umrandb}{104}</code>
	<code>\Pisymbol{umrandb}{21}</code>		<code>\Pisymbol{umrandb}{63}</code>		<code>\Pisymbol{umrandb}{105}</code>
	<code>\Pisymbol{umrandb}{22}</code>		<code>\Pisymbol{umrandb}{64}</code>		<code>\Pisymbol{umrandb}{106}</code>
	<code>\Pisymbol{umrandb}{23}</code>		<code>\Pisymbol{umrandb}{65}</code>		<code>\Pisymbol{umrandb}{107}</code>
	<code>\Pisymbol{umrandb}{24}</code>		<code>\Pisymbol{umrandb}{66}</code>		<code>\Pisymbol{umrandb}{108}</code>
	<code>\Pisymbol{umrandb}{25}</code>		<code>\Pisymbol{umrandb}{67}</code>		<code>\Pisymbol{umrandb}{109}</code>
	<code>\Pisymbol{umrandb}{26}</code>		<code>\Pisymbol{umrandb}{68}</code>		<code>\Pisymbol{umrandb}{110}</code>
	<code>\Pisymbol{umrandb}{27}</code>		<code>\Pisymbol{umrandb}{69}</code>		<code>\Pisymbol{umrandb}{111}</code>
	<code>\Pisymbol{umrandb}{28}</code>		<code>\Pisymbol{umrandb}{70}</code>		<code>\Pisymbol{umrandb}{112}</code>
	<code>\Pisymbol{umrandb}{29}</code>		<code>\Pisymbol{umrandb}{71}</code>		<code>\Pisymbol{umrandb}{113}</code>
	<code>\Pisymbol{umrandb}{30}</code>		<code>\Pisymbol{umrandb}{72}</code>		<code>\Pisymbol{umrandb}{114}</code>
	<code>\Pisymbol{umrandb}{31}</code>		<code>\Pisymbol{umrandb}{73}</code>		<code>\Pisymbol{umrandb}{115}</code>
	<code>\Pisymbol{umrandb}{32}</code>		<code>\Pisymbol{umrandb}{74}</code>		<code>\Pisymbol{umrandb}{116}</code>
	<code>\Pisymbol{umrandb}{33}</code>		<code>\Pisymbol{umrandb}{75}</code>		<code>\Pisymbol{umrandb}{117}</code>
	<code>\Pisymbol{umrandb}{34}</code>		<code>\Pisymbol{umrandb}{76}</code>		<code>\Pisymbol{umrandb}{118}</code>
	<code>\Pisymbol{umrandb}{35}</code>		<code>\Pisymbol{umrandb}{77}</code>		<code>\Pisymbol{umrandb}{119}</code>
	<code>\Pisymbol{umrandb}{36}</code>		<code>\Pisymbol{umrandb}{78}</code>		<code>\Pisymbol{umrandb}{120}</code>
	<code>\Pisymbol{umrandb}{37}</code>		<code>\Pisymbol{umrandb}{79}</code>		<code>\Pisymbol{umrandb}{121}</code>
	<code>\Pisymbol{umrandb}{38}</code>		<code>\Pisymbol{umrandb}{80}</code>		<code>\Pisymbol{umrandb}{122}</code>
	<code>\Pisymbol{umrandb}{39}</code>		<code>\Pisymbol{umrandb}{81}</code>		<code>\Pisymbol{umrandb}{123}</code>
	<code>\Pisymbol{umrandb}{40}</code>		<code>\Pisymbol{umrandb}{82}</code>		
	<code>\Pisymbol{umrandb}{41}</code>		<code>\Pisymbol{umrandb}{83}</code>		

The niceframe package can be used to typeset decorative frames using fonts such as umrandb.

TABLE 675: dingbat Decorative Borders

	<code>\Pisymbol{dingbat}{69}</code>		<code>\Pisymbol{dingbat}{97}</code>
	<code>\Pisymbol{dingbat}{70}</code>		<code>\Pisymbol{dingbat}{98}</code>
	<code>\Pisymbol{dingbat}{71}</code>		<code>\Pisymbol{dingbat}{99}</code>
	<code>\Pisymbol{dingbat}{72}</code>		<code>\Pisymbol{dingbat}{100}</code>
	<code>\Pisymbol{dingbat}{74}</code>		<code>\Pisymbol{dingbat}{101}</code>
	<code>\Pisymbol{dingbat}{75}</code>		<code>\Pisymbol{dingbat}{102}</code>
	<code>\Pisymbol{dingbat}{76}</code>		<code>\Pisymbol{dingbat}{103}</code>
	<code>\Pisymbol{dingbat}{77}</code>		<code>\Pisymbol{dingbat}{104}</code>











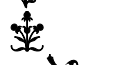





















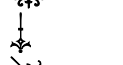






























The preceding table is incomplete in that it includes only unnamed dingbat symbols. Named symbols are included in Table 403 and Table 451 (both intermixed with symbols from the `ark10` font).

The `dingbat` package includes a `udingbat.fd` file so a document does not need to specify the `\DeclareFontFamily` and `\DeclareFontShape` commands list at the beginning of Chapter 11.

The `niceframe` package can be used to typeset decorative frames using fonts such as `dingbat`.





































































TABLE 676: pgfornament Decorative Borders (Vintage)

	<code>\pgfornament{1}</code>		<code>\pgfornament{102}</code>
	<code>\pgfornament{2}</code>		<code>\pgfornament{103}</code>
	<code>\pgfornament{3}</code>		<code>\pgfornament{104}</code>
	<code>\pgfornament{4}</code>		<code>\pgfornament{105}</code>
	<code>\pgfornament{5}</code>		<code>\pgfornament{106}</code>
	<code>\pgfornament{6}</code>		<code>\pgfornament{107}</code>
	<code>\pgfornament{7}</code>		<code>\pgfornament{108}</code>
	<code>\pgfornament{8}</code>		<code>\pgfornament{109}</code>
	<code>\pgfornament{9}</code>		<code>\pgfornament{110}</code>
	<code>\pgfornament{10}</code>		<code>\pgfornament{111}</code>
	<code>\pgfornament{11}</code>		<code>\pgfornament{112}</code>
	<code>\pgfornament{12}</code>		<code>\pgfornament{113}</code>
	<code>\pgfornament{13}</code>		<code>\pgfornament{114}</code>
	<code>\pgfornament{14}</code>		<code>\pgfornament{115}</code>
	<code>\pgfornament{15}</code>		<code>\pgfornament{116}</code>
	<code>\pgfornament{16}</code>		<code>\pgfornament{117}</code>
	<code>\pgfornament{17}</code>		<code>\pgfornament{118}</code>
	<code>\pgfornament{18}</code>		<code>\pgfornament{119}</code>
	<code>\pgfornament{19}</code>		<code>\pgfornament{120}</code>
	<code>\pgfornament{20}</code>		<code>\pgfornament{121}</code>
	<code>\pgfornament{21}</code>		<code>\pgfornament{122}</code>
	<code>\pgfornament{22}</code>		<code>\pgfornament{123}</code>
	<code>\pgfornament{23}</code>		<code>\pgfornament{124}</code>
	<code>\pgfornament{24}</code>		<code>\pgfornament{125}</code>
	<code>\pgfornament{25}</code>		<code>\pgfornament{126}</code>
	<code>\pgfornament{26}</code>		<code>\pgfornament{127}</code>
	<code>\pgfornament{27}</code>		<code>\pgfornament{128}</code>
	<code>\pgfornament{28}</code>		<code>\pgfornament{129}</code>
	<code>\pgfornament{29}</code>		<code>\pgfornament{130}</code>
	<code>\pgfornament{30}</code>		<code>\pgfornament{131}</code>
	<code>\pgfornament{31}</code>		<code>\pgfornament{132}</code>
	<code>\pgfornament{32}</code>		<code>\pgfornament{133}</code>

(continued on next page)

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	<code>\pgfornament{33}</code>		<code>\pgfornament{134}</code>
	<code>\pgfornament{34}</code>		<code>\pgfornament{135}</code>
	<code>\pgfornament{35}</code>		<code>\pgfornament{136}</code>
	<code>\pgfornament{36}</code>		<code>\pgfornament{137}</code>
	<code>\pgfornament{37}</code>		<code>\pgfornament{138}</code>
	<code>\pgfornament{38}</code>		<code>\pgfornament{139}</code>
	<code>\pgfornament{39}</code>		<code>\pgfornament{140}</code>
	<code>\pgfornament{40}</code>		<code>\pgfornament{141}</code>
	<code>\pgfornament{41}</code>		<code>\pgfornament{142}</code>
	<code>\pgfornament{42}</code>		<code>\pgfornament{143}</code>
	<code>\pgfornament{43}</code>		<code>\pgfornament{144}</code>
	<code>\pgfornament{44}</code>		<code>\pgfornament{145}</code>
	<code>\pgfornament{45}</code>		<code>\pgfornament{146}</code>
	<code>\pgfornament{46}</code>		<code>\pgfornament{147}</code>
	<code>\pgfornament{47}</code>		<code>\pgfornament{148}</code>
	<code>\pgfornament{48}</code>		<code>\pgfornament{149}</code>
	<code>\pgfornament{49}</code>		<code>\pgfornament{150}</code>
	<code>\pgfornament{50}</code>		<code>\pgfornament{151}</code>
	<code>\pgfornament{51}</code>		<code>\pgfornament{152}</code>
	<code>\pgfornament{52}</code>		<code>\pgfornament{153}</code>
	<code>\pgfornament{53}</code>		<code>\pgfornament{154}</code>
	<code>\pgfornament{54}</code>		<code>\pgfornament{155}</code>
	<code>\pgfornament{55}</code>		<code>\pgfornament{156}</code>
	<code>\pgfornament{56}</code>		<code>\pgfornament{157}</code>
	<code>\pgfornament{57}</code>		<code>\pgfornament{158}</code>
	<code>\pgfornament{58}</code>		<code>\pgfornament{159}</code>
	<code>\pgfornament{59}</code>		<code>\pgfornament{160}</code>
	<code>\pgfornament{60}</code>		<code>\pgfornament{161}</code>
	<code>\pgfornament{61}</code>		<code>\pgfornament{162}</code>
	<code>\pgfornament{62}</code>		<code>\pgfornament{163}</code>
	<code>\pgfornament{63}</code>		<code>\pgfornament{164}</code>
	<code>\pgfornament{64}</code>		<code>\pgfornament{165}</code>
	<code>\pgfornament{65}</code>		<code>\pgfornament{166}</code>

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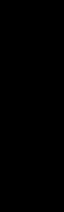
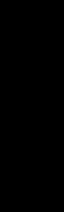
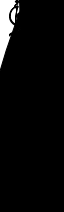
`\pgfornament{66}`



`\pgfornament{167}`

`\pgfornament{67}`

`\pgfornament{168}`



`{66}`

`{187}`

`ent{188}`

`ament{189}`

`ent{191}`

`{192}`

`{193}`

The symbols in this table are selected with `\newpgfornamentfamily{vectorian}`. All `pgfornament` symbols are implemented with TikZ graphics, not with a font. The `\pgfornament` command supports resizing, coloring, and rotating symbols. See the `pgfornament` documentation for more information.

The following symbols are omitted from the table due to their width:











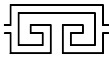






















































	<code>\pgfornament{80}</code>
	<code>\pgfornament{82}</code>
	<code>\pgfornament{83}</code>
	<code>\pgfornament{85}</code>
	<code>\pgfornament{86}</code>
	<code>\pgfornament{88}</code>

TABLE 677: `pgfornament` Decorative Borders (Traditional Chinese Motifs)

	<code>\pgfornament{1}</code>		<code>\pgfornament{42}</code>
	<code>\pgfornament{2}</code>		<code>\pgfornament{43}</code>
	<code>\pgfornament{3}</code>		<code>\pgfornament{44}</code>
	<code>\pgfornament{4}</code>		<code>\pgfornament{45}</code>
	<code>\pgfornament{5}</code>		<code>\pgfornament{46}</code>
	<code>\pgfornament{6}</code>		<code>\pgfornament{47}</code>
	<code>\pgfornament{7}</code>		<code>\pgfornament{48}</code>
	<code>\pgfornament{8}</code>		<code>\pgfornament{49}</code>
	<code>\pgfornament{9}</code>		<code>\pgfornament{50}</code>
	<code>\pgfornament{10}</code>		<code>\pgfornament{51}</code>
	<code>\pgfornament{11}</code>		<code>\pgfornament{52}</code>











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	<code>\pgfornament{12}</code>		<code>\pgfornament{53}</code>
	<code>\pgfornament{13}</code>		<code>\pgfornament{54}</code>
	<code>\pgfornament{14}</code>		<code>\pgfornament{55}</code>
	<code>\pgfornament{15}</code>		<code>\pgfornament{56}</code>
	<code>\pgfornament{16}</code>		<code>\pgfornament{57}</code>
	<code>\pgfornament{17}</code>		<code>\pgfornament{58}</code>
	<code>\pgfornament{18}</code>		<code>\pgfornament{59}</code>
	<code>\pgfornament{19}</code>		<code>\pgfornament{60}</code>
	<code>\pgfornament{20}</code>		<code>\pgfornament{61}</code>
	<code>\pgfornament{21}</code>		<code>\pgfornament{62}</code>
	<code>\pgfornament{22}</code>		<code>\pgfornament{63}</code>
	<code>\pgfornament{23}</code>		<code>\pgfornament{64}</code>
	<code>\pgfornament{24}</code>		<code>\pgfornament{65}</code>
	<code>\pgfornament{25}</code>		<code>\pgfornament{66}</code>
	<code>\pgfornament{26}</code>		<code>\pgfornament{67}</code>
	<code>\pgfornament{27}</code>		<code>\pgfornament{68}</code>
	<code>\pgfornament{28}</code>		<code>\pgfornament{69}</code>
	<code>\pgfornament{33}</code>		<code>\pgfornament{70}</code>
	<code>\pgfornament{34}</code>		<code>\pgfornament{71}</code>
	<code>\pgfornament{35}</code>		<code>\pgfornament{72}</code>
	<code>\pgfornament{36}</code>		<code>\pgfornament{73}</code>

*(continued on next page)*








































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	<code>\pgfornament{37}</code>		<code>\pgfornament{74}</code>
	<code>\pgfornament{38}</code>		<code>\pgfornament{75}</code>
	<code>\pgfornament{39}</code>		<code>\pgfornament{76}</code>
	<code>\pgfornament{40}</code>		<code>\pgfornament{77}</code>
	<code>\pgfornament{41}</code>		<code>\pgfornament{78}</code>

The symbols in this table are selected with `\newpgfornamentfamily{han}`. All `\pgfornament` symbols are implemented with TikZ graphics, not with a font. The `\pgfornament` command supports resizing, coloring, and rotating symbols. See the `\pgfornament` documentation for more information.

Not shown in the table due to their width are `\pgfornament{29}`, `\pgfornament{30}`, `\pgfornament{31}`, and `\pgfornament{32}`. These represent various horizontal rules (thick, double thin, double thick, and triple thin, respectively).

TABLE 678: knot Celtic Knots

	<code>\Pisymbol{knot1}{48}</code>		<code>\Pisymbol{knot1}{68}</code>		<code>\Pisymbol{knot1}{84}</code>
	<code>\Pisymbol{knot1}{49}</code>		<code>\Pisymbol{knot1}{69}</code>		<code>\Pisymbol{knot1}{85}</code>
	<code>\Pisymbol{knot1}{50}</code>		<code>\Pisymbol{knot1}{70}</code>		<code>\Pisymbol{knot1}{86}</code>
	<code>\Pisymbol{knot1}{51}</code>		<code>\Pisymbol{knot1}{71}</code>		<code>\Pisymbol{knot1}{87}</code>
	<code>\Pisymbol{knot1}{52}</code>		<code>\Pisymbol{knot1}{72}</code>		<code>\Pisymbol{knot1}{88}</code>
	<code>\Pisymbol{knot1}{53}</code>		<code>\Pisymbol{knot1}{73}</code>		<code>\Pisymbol{knot1}{96}</code>
	<code>\Pisymbol{knot1}{58}</code>		<code>\Pisymbol{knot1}{74}</code>		<code>\Pisymbol{knot1}{97}</code>
	<code>\Pisymbol{knot1}{59}</code>		<code>\Pisymbol{knot1}{75}</code>		<code>\Pisymbol{knot1}{98}</code>
	<code>\Pisymbol{knot1}{60}</code>		<code>\Pisymbol{knot1}{76}</code>		<code>\Pisymbol{knot1}{99}</code>
	<code>\Pisymbol{knot1}{61}</code>		<code>\Pisymbol{knot1}{77}</code>		<code>\Pisymbol{knot1}{100}</code>
	<code>\Pisymbol{knot1}{62}</code>		<code>\Pisymbol{knot1}{78}</code>		<code>\Pisymbol{knot1}{101}</code>
	<code>\Pisymbol{knot1}{63}</code>		<code>\Pisymbol{knot1}{79}</code>		<code>\Pisymbol{knot1}{102}</code>
	<code>\Pisymbol{knot1}{64}</code>		<code>\Pisymbol{knot1}{80}</code>		<code>\Pisymbol{knot1}{103}</code>
























































































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	<code>\Pisymbol{knot1}{65}</code>		<code>\Pisymbol{knot1}{81}</code>		<code>\Pisymbol{knot1}{104}</code>
	<code>\Pisymbol{knot1}{66}</code>		<code>\Pisymbol{knot1}{82}</code>		<code>\Pisymbol{knot1}{105}</code>
	<code>\Pisymbol{knot1}{67}</code>		<code>\Pisymbol{knot1}{83}</code>		
	<code>\Pisymbol{knot2}{48}</code>		<code>\Pisymbol{knot2}{68}</code>		<code>\Pisymbol{knot2}{84}</code>
	<code>\Pisymbol{knot2}{49}</code>		<code>\Pisymbol{knot2}{69}</code>		<code>\Pisymbol{knot2}{85}</code>
	<code>\Pisymbol{knot2}{50}</code>		<code>\Pisymbol{knot2}{70}</code>		<code>\Pisymbol{knot2}{86}</code>
	<code>\Pisymbol{knot2}{51}</code>		<code>\Pisymbol{knot2}{71}</code>		<code>\Pisymbol{knot2}{87}</code>
	<code>\Pisymbol{knot2}{52}</code>		<code>\Pisymbol{knot2}{72}</code>		<code>\Pisymbol{knot2}{88}</code>
	<code>\Pisymbol{knot2}{53}</code>		<code>\Pisymbol{knot2}{73}</code>		<code>\Pisymbol{knot2}{96}</code>
	<code>\Pisymbol{knot2}{58}</code>		<code>\Pisymbol{knot2}{74}</code>		<code>\Pisymbol{knot2}{97}</code>
	<code>\Pisymbol{knot2}{59}</code>		<code>\Pisymbol{knot2}{75}</code>		<code>\Pisymbol{knot2}{98}</code>
	<code>\Pisymbol{knot2}{60}</code>		<code>\Pisymbol{knot2}{76}</code>		<code>\Pisymbol{knot2}{99}</code>
	<code>\Pisymbol{knot2}{61}</code>		<code>\Pisymbol{knot2}{77}</code>		<code>\Pisymbol{knot2}{100}</code>
	<code>\Pisymbol{knot2}{62}</code>		<code>\Pisymbol{knot2}{78}</code>		<code>\Pisymbol{knot2}{101}</code>
	<code>\Pisymbol{knot2}{63}</code>		<code>\Pisymbol{knot2}{79}</code>		<code>\Pisymbol{knot2}{102}</code>
	<code>\Pisymbol{knot2}{64}</code>		<code>\Pisymbol{knot2}{80}</code>		<code>\Pisymbol{knot2}{103}</code>
	<code>\Pisymbol{knot2}{65}</code>		<code>\Pisymbol{knot2}{81}</code>		<code>\Pisymbol{knot2}{104}</code>
	<code>\Pisymbol{knot2}{66}</code>		<code>\Pisymbol{knot2}{82}</code>		<code>\Pisymbol{knot2}{105}</code>
	<code>\Pisymbol{knot2}{67}</code>		<code>\Pisymbol{knot2}{83}</code>		
	<code>\Pisymbol{knot3}{48}</code>		<code>\Pisymbol{knot3}{68}</code>		<code>\Pisymbol{knot3}{84}</code>
	<code>\Pisymbol{knot3}{49}</code>		<code>\Pisymbol{knot3}{69}</code>		<code>\Pisymbol{knot3}{85}</code>
	<code>\Pisymbol{knot3}{50}</code>		<code>\Pisymbol{knot3}{70}</code>		<code>\Pisymbol{knot3}{86}</code>
	<code>\Pisymbol{knot3}{51}</code>		<code>\Pisymbol{knot3}{71}</code>		<code>\Pisymbol{knot3}{87}</code>
	<code>\Pisymbol{knot3}{52}</code>		<code>\Pisymbol{knot3}{72}</code>		<code>\Pisymbol{knot3}{88}</code>
	<code>\Pisymbol{knot3}{53}</code>		<code>\Pisymbol{knot3}{73}</code>		<code>\Pisymbol{knot3}{96}</code>
	<code>\Pisymbol{knot3}{58}</code>		<code>\Pisymbol{knot3}{74}</code>		<code>\Pisymbol{knot3}{97}</code>
	<code>\Pisymbol{knot3}{59}</code>		<code>\Pisymbol{knot3}{75}</code>		<code>\Pisymbol{knot3}{98}</code>
	<code>\Pisymbol{knot3}{60}</code>		<code>\Pisymbol{knot3}{76}</code>		<code>\Pisymbol{knot3}{99}</code>
	<code>\Pisymbol{knot3}{61}</code>		<code>\Pisymbol{knot3}{77}</code>		<code>\Pisymbol{knot3}{100}</code>
	<code>\Pisymbol{knot3}{62}</code>		<code>\Pisymbol{knot3}{78}</code>		<code>\Pisymbol{knot3}{101}</code>
	<code>\Pisymbol{knot3}{63}</code>		<code>\Pisymbol{knot3}{79}</code>		<code>\Pisymbol{knot3}{102}</code>
	<code>\Pisymbol{knot3}{64}</code>		<code>\Pisymbol{knot3}{80}</code>		<code>\Pisymbol{knot3}{103}</code>

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



































































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	<code>\Pisymbol{knot3}{65}</code>		<code>\Pisymbol{knot3}{81}</code>		<code>\Pisymbol{knot3}{104}</code>
	<code>\Pisymbol{knot3}{66}</code>		<code>\Pisymbol{knot3}{82}</code>		<code>\Pisymbol{knot3}{105}</code>
	<code>\Pisymbol{knot3}{67}</code>		<code>\Pisymbol{knot3}{83}</code>		
	<code>\Pisymbol{knot4}{48}</code>		<code>\Pisymbol{knot4}{68}</code>		<code>\Pisymbol{knot4}{84}</code>
	<code>\Pisymbol{knot4}{49}</code>		<code>\Pisymbol{knot4}{69}</code>		<code>\Pisymbol{knot4}{85}</code>
	<code>\Pisymbol{knot4}{50}</code>		<code>\Pisymbol{knot4}{70}</code>		<code>\Pisymbol{knot4}{86}</code>
	<code>\Pisymbol{knot4}{51}</code>		<code>\Pisymbol{knot4}{71}</code>		<code>\Pisymbol{knot4}{87}</code>
	<code>\Pisymbol{knot4}{52}</code>		<code>\Pisymbol{knot4}{72}</code>		<code>\Pisymbol{knot4}{88}</code>
	<code>\Pisymbol{knot4}{53}</code>		<code>\Pisymbol{knot4}{73}</code>		<code>\Pisymbol{knot4}{96}</code>
	<code>\Pisymbol{knot4}{58}</code>		<code>\Pisymbol{knot4}{74}</code>		<code>\Pisymbol{knot4}{97}</code>
	<code>\Pisymbol{knot4}{59}</code>		<code>\Pisymbol{knot4}{75}</code>		<code>\Pisymbol{knot4}{98}</code>
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	<code>\Pisymbol{knot4}{61}</code>		<code>\Pisymbol{knot4}{77}</code>		<code>\Pisymbol{knot4}{100}</code>
	<code>\Pisymbol{knot4}{62}</code>		<code>\Pisymbol{knot4}{78}</code>		<code>\Pisymbol{knot4}{101}</code>
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	<code>\Pisymbol{knot4}{64}</code>		<code>\Pisymbol{knot4}{80}</code>		<code>\Pisymbol{knot4}{103}</code>
	<code>\Pisymbol{knot4}{65}</code>		<code>\Pisymbol{knot4}{81}</code>		<code>\Pisymbol{knot4}{104}</code>
	<code>\Pisymbol{knot4}{66}</code>		<code>\Pisymbol{knot4}{82}</code>		<code>\Pisymbol{knot4}{105}</code>
	<code>\Pisymbol{knot4}{67}</code>		<code>\Pisymbol{knot4}{83}</code>		
	<code>\Pisymbol{knot5}{48}</code>		<code>\Pisymbol{knot5}{68}</code>		<code>\Pisymbol{knot5}{84}</code>
	<code>\Pisymbol{knot5}{49}</code>		<code>\Pisymbol{knot5}{69}</code>		<code>\Pisymbol{knot5}{85}</code>
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	<code>\Pisymbol{knot5}{51}</code>		<code>\Pisymbol{knot5}{71}</code>		<code>\Pisymbol{knot5}{87}</code>
	<code>\Pisymbol{knot5}{52}</code>		<code>\Pisymbol{knot5}{72}</code>		<code>\Pisymbol{knot5}{88}</code>
	<code>\Pisymbol{knot5}{53}</code>		<code>\Pisymbol{knot5}{73}</code>		<code>\Pisymbol{knot5}{96}</code>
	<code>\Pisymbol{knot5}{58}</code>		<code>\Pisymbol{knot5}{74}</code>		<code>\Pisymbol{knot5}{97}</code>
	<code>\Pisymbol{knot5}{59}</code>		<code>\Pisymbol{knot5}{75}</code>		<code>\Pisymbol{knot5}{98}</code>
	<code>\Pisymbol{knot5}{60}</code>		<code>\Pisymbol{knot5}{76}</code>		<code>\Pisymbol{knot5}{99}</code>
	<code>\Pisymbol{knot5}{61}</code>		<code>\Pisymbol{knot5}{77}</code>		<code>\Pisymbol{knot5}{100}</code>
	<code>\Pisymbol{knot5}{62}</code>		<code>\Pisymbol{knot5}{78}</code>		<code>\Pisymbol{knot5}{101}</code>
	<code>\Pisymbol{knot5}{63}</code>		<code>\Pisymbol{knot5}{79}</code>		<code>\Pisymbol{knot5}{102}</code>
	<code>\Pisymbol{knot5}{64}</code>		<code>\Pisymbol{knot5}{80}</code>		<code>\Pisymbol{knot5}{103}</code>

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

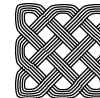


	<code>\Pisymbol{knot5}{65}</code>		<code>\Pisymbol{knot5}{81}</code>		<code>\Pisymbol{knot5}{104}</code>
	<code>\Pisymbol{knot5}{66}</code>		<code>\Pisymbol{knot5}{82}</code>		<code>\Pisymbol{knot5}{105}</code>
	<code>\Pisymbol{knot5}{67}</code>		<code>\Pisymbol{knot5}{83}</code>		
	<code>\Pisymbol{knot6}{48}</code>		<code>\Pisymbol{knot6}{68}</code>		<code>\Pisymbol{knot6}{84}</code>
	<code>\Pisymbol{knot6}{49}</code>		<code>\Pisymbol{knot6}{69}</code>		<code>\Pisymbol{knot6}{85}</code>
	<code>\Pisymbol{knot6}{50}</code>		<code>\Pisymbol{knot6}{70}</code>		<code>\Pisymbol{knot6}{86}</code>
	<code>\Pisymbol{knot6}{51}</code>		<code>\Pisymbol{knot6}{71}</code>		<code>\Pisymbol{knot6}{87}</code>
	<code>\Pisymbol{knot6}{52}</code>		<code>\Pisymbol{knot6}{72}</code>		<code>\Pisymbol{knot6}{88}</code>
	<code>\Pisymbol{knot6}{53}</code>		<code>\Pisymbol{knot6}{73}</code>		<code>\Pisymbol{knot6}{96}</code>
	<code>\Pisymbol{knot6}{58}</code>		<code>\Pisymbol{knot6}{74}</code>		<code>\Pisymbol{knot6}{97}</code>
	<code>\Pisymbol{knot6}{59}</code>		<code>\Pisymbol{knot6}{75}</code>		<code>\Pisymbol{knot6}{98}</code>
	<code>\Pisymbol{knot6}{60}</code>		<code>\Pisymbol{knot6}{76}</code>		<code>\Pisymbol{knot6}{99}</code>
	<code>\Pisymbol{knot6}{61}</code>		<code>\Pisymbol{knot6}{77}</code>		<code>\Pisymbol{knot6}{100}</code>
	<code>\Pisymbol{knot6}{62}</code>		<code>\Pisymbol{knot6}{78}</code>		<code>\Pisymbol{knot6}{101}</code>
	<code>\Pisymbol{knot6}{63}</code>		<code>\Pisymbol{knot6}{79}</code>		<code>\Pisymbol{knot6}{102}</code>
	<code>\Pisymbol{knot6}{64}</code>		<code>\Pisymbol{knot6}{80}</code>		<code>\Pisymbol{knot6}{103}</code>
	<code>\Pisymbol{knot6}{65}</code>		<code>\Pisymbol{knot6}{81}</code>		<code>\Pisymbol{knot6}{104}</code>
	<code>\Pisymbol{knot6}{66}</code>		<code>\Pisymbol{knot6}{82}</code>		<code>\Pisymbol{knot6}{105}</code>
	<code>\Pisymbol{knot6}{67}</code>		<code>\Pisymbol{knot6}{83}</code>		
	<code>\Pisymbol{knot7}{48}</code>		<code>\Pisymbol{knot7}{68}</code>		<code>\Pisymbol{knot7}{84}</code>
	<code>\Pisymbol{knot7}{49}</code>		<code>\Pisymbol{knot7}{69}</code>		<code>\Pisymbol{knot7}{85}</code>
	<code>\Pisymbol{knot7}{50}</code>		<code>\Pisymbol{knot7}{70}</code>		<code>\Pisymbol{knot7}{86}</code>
	<code>\Pisymbol{knot7}{51}</code>		<code>\Pisymbol{knot7}{71}</code>		<code>\Pisymbol{knot7}{87}</code>
	<code>\Pisymbol{knot7}{52}</code>		<code>\Pisymbol{knot7}{72}</code>		<code>\Pisymbol{knot7}{88}</code>
	<code>\Pisymbol{knot7}{53}</code>		<code>\Pisymbol{knot7}{73}</code>		<code>\Pisymbol{knot7}{96}</code>
	<code>\Pisymbol{knot7}{58}</code>		<code>\Pisymbol{knot7}{74}</code>		<code>\Pisymbol{knot7}{97}</code>
	<code>\Pisymbol{knot7}{59}</code>		<code>\Pisymbol{knot7}{75}</code>		<code>\Pisymbol{knot7}{98}</code>
	<code>\Pisymbol{knot7}{60}</code>		<code>\Pisymbol{knot7}{76}</code>		<code>\Pisymbol{knot7}{99}</code>
	<code>\Pisymbol{knot7}{61}</code>		<code>\Pisymbol{knot7}{77}</code>		<code>\Pisymbol{knot7}{100}</code>
	<code>\Pisymbol{knot7}{62}</code>		<code>\Pisymbol{knot7}{78}</code>		<code>\Pisymbol{knot7}{101}</code>
	<code>\Pisymbol{knot7}{63}</code>		<code>\Pisymbol{knot7}{79}</code>		<code>\Pisymbol{knot7}{102}</code>
	<code>\Pisymbol{knot7}{64}</code>		<code>\Pisymbol{knot7}{80}</code>		<code>\Pisymbol{knot7}{103}</code>

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






























	<code>\Pisymbol{knot7}{65}</code>		<code>\Pisymbol{knot7}{81}</code>		<code>\Pisymbol{knot7}{104}</code>
	<code>\Pisymbol{knot7}{66}</code>		<code>\Pisymbol{knot7}{82}</code>		<code>\Pisymbol{knot7}{105}</code>
	<code>\Pisymbol{knot7}{67}</code>		<code>\Pisymbol{knot7}{83}</code>		

The following is an example of a basic knot, using `\usefont{U}{knot(number)}{m}{n}` to change fonts for multiple characters instead of `\Pisymbol` to typeset one character at a time. Note that all of the characters in the knot fonts lie conveniently within the range of printable ASCII characters.

Input	knot1	knot2	knot3	knot4	knot5	knot6	knot7
CDB							
FHG							
@EA							

The niceframe package can be used to typeset decorative frames using fonts such as knot, especially using characters 48–63 of each font variant.

TABLE 679: dancers Dancing Men

	<code>\Pisymbol{dancers}{0}</code>		<code>\Pisymbol{dancers}{86}</code>		<code>\Pisymbol{dancers}{172}</code>
	<code>\Pisymbol{dancers}{1}</code>		<code>\Pisymbol{dancers}{87}</code>		<code>\Pisymbol{dancers}{173}</code>
	<code>\Pisymbol{dancers}{2}</code>		<code>\Pisymbol{dancers}{88}</code>		<code>\Pisymbol{dancers}{174}</code>
	<code>\Pisymbol{dancers}{3}</code>		<code>\Pisymbol{dancers}{89}</code>		<code>\Pisymbol{dancers}{175}</code>
	<code>\Pisymbol{dancers}{4}</code>		<code>\Pisymbol{dancers}{90}</code>		<code>\Pisymbol{dancers}{176}</code>
	<code>\Pisymbol{dancers}{5}</code>		<code>\Pisymbol{dancers}{91}</code>		<code>\Pisymbol{dancers}{177}</code>
	<code>\Pisymbol{dancers}{6}</code>		<code>\Pisymbol{dancers}{92}</code>		<code>\Pisymbol{dancers}{178}</code>
	<code>\Pisymbol{dancers}{7}</code>		<code>\Pisymbol{dancers}{93}</code>		<code>\Pisymbol{dancers}{179}</code>
	<code>\Pisymbol{dancers}{8}</code>		<code>\Pisymbol{dancers}{94}</code>		<code>\Pisymbol{dancers}{180}</code>
	<code>\Pisymbol{dancers}{9}</code>		<code>\Pisymbol{dancers}{95}</code>		<code>\Pisymbol{dancers}{181}</code>
	<code>\Pisymbol{dancers}{10}</code>		<code>\Pisymbol{dancers}{96}</code>		<code>\Pisymbol{dancers}{182}</code>
	<code>\Pisymbol{dancers}{11}</code>		<code>\Pisymbol{dancers}{97}</code>		<code>\Pisymbol{dancers}{183}</code>

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	<code>\Pisymbol{dancers}{12}</code>		<code>\Pisymbol{dancers}{98}</code>		<code>\Pisymbol{dancers}{184}</code>
	<code>\Pisymbol{dancers}{13}</code>		<code>\Pisymbol{dancers}{99}</code>		<code>\Pisymbol{dancers}{185}</code>
	<code>\Pisymbol{dancers}{14}</code>		<code>\Pisymbol{dancers}{100}</code>		<code>\Pisymbol{dancers}{186}</code>
	<code>\Pisymbol{dancers}{15}</code>		<code>\Pisymbol{dancers}{101}</code>		<code>\Pisymbol{dancers}{187}</code>
	<code>\Pisymbol{dancers}{16}</code>		<code>\Pisymbol{dancers}{102}</code>		<code>\Pisymbol{dancers}{188}</code>
	<code>\Pisymbol{dancers}{17}</code>		<code>\Pisymbol{dancers}{103}</code>		<code>\Pisymbol{dancers}{189}</code>
	<code>\Pisymbol{dancers}{18}</code>		<code>\Pisymbol{dancers}{104}</code>		<code>\Pisymbol{dancers}{190}</code>
	<code>\Pisymbol{dancers}{19}</code>		<code>\Pisymbol{dancers}{105}</code>		<code>\Pisymbol{dancers}{191}</code>
	<code>\Pisymbol{dancers}{20}</code>		<code>\Pisymbol{dancers}{106}</code>		<code>\Pisymbol{dancers}{192}</code>
	<code>\Pisymbol{dancers}{21}</code>		<code>\Pisymbol{dancers}{107}</code>		<code>\Pisymbol{dancers}{193}</code>
	<code>\Pisymbol{dancers}{22}</code>		<code>\Pisymbol{dancers}{108}</code>		<code>\Pisymbol{dancers}{194}</code>
	<code>\Pisymbol{dancers}{23}</code>		<code>\Pisymbol{dancers}{109}</code>		<code>\Pisymbol{dancers}{195}</code>
	<code>\Pisymbol{dancers}{24}</code>		<code>\Pisymbol{dancers}{110}</code>		<code>\Pisymbol{dancers}{196}</code>
	<code>\Pisymbol{dancers}{25}</code>		<code>\Pisymbol{dancers}{111}</code>		<code>\Pisymbol{dancers}{197}</code>
	<code>\Pisymbol{dancers}{26}</code>		<code>\Pisymbol{dancers}{112}</code>		<code>\Pisymbol{dancers}{198}</code>
	<code>\Pisymbol{dancers}{27}</code>		<code>\Pisymbol{dancers}{113}</code>		<code>\Pisymbol{dancers}{199}</code>
	<code>\Pisymbol{dancers}{28}</code>		<code>\Pisymbol{dancers}{114}</code>		<code>\Pisymbol{dancers}{200}</code>
	<code>\Pisymbol{dancers}{29}</code>		<code>\Pisymbol{dancers}{115}</code>		<code>\Pisymbol{dancers}{201}</code>
	<code>\Pisymbol{dancers}{30}</code>		<code>\Pisymbol{dancers}{116}</code>		<code>\Pisymbol{dancers}{202}</code>
	<code>\Pisymbol{dancers}{31}</code>		<code>\Pisymbol{dancers}{117}</code>		<code>\Pisymbol{dancers}{203}</code>
	<code>\Pisymbol{dancers}{32}</code>		<code>\Pisymbol{dancers}{118}</code>		<code>\Pisymbol{dancers}{204}</code>
	<code>\Pisymbol{dancers}{33}</code>		<code>\Pisymbol{dancers}{119}</code>		<code>\Pisymbol{dancers}{205}</code>
	<code>\Pisymbol{dancers}{34}</code>		<code>\Pisymbol{dancers}{120}</code>		<code>\Pisymbol{dancers}{206}</code>
	<code>\Pisymbol{dancers}{35}</code>		<code>\Pisymbol{dancers}{121}</code>		<code>\Pisymbol{dancers}{207}</code>
	<code>\Pisymbol{dancers}{36}</code>		<code>\Pisymbol{dancers}{122}</code>		<code>\Pisymbol{dancers}{208}</code>
	<code>\Pisymbol{dancers}{37}</code>		<code>\Pisymbol{dancers}{123}</code>		<code>\Pisymbol{dancers}{209}</code>
	<code>\Pisymbol{dancers}{38}</code>		<code>\Pisymbol{dancers}{124}</code>		<code>\Pisymbol{dancers}{210}</code>
	<code>\Pisymbol{dancers}{39}</code>		<code>\Pisymbol{dancers}{125}</code>		<code>\Pisymbol{dancers}{211}</code>
	<code>\Pisymbol{dancers}{40}</code>		<code>\Pisymbol{dancers}{126}</code>		<code>\Pisymbol{dancers}{212}</code>
	<code>\Pisymbol{dancers}{41}</code>		<code>\Pisymbol{dancers}{127}</code>		<code>\Pisymbol{dancers}{213}</code>









































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 \Pisymbol{dancers}{42}	 \Pisymbol{dancers}{128}	 \Pisymbol{dancers}{214}
 \Pisymbol{dancers}{43}	 \Pisymbol{dancers}{129}	 \Pisymbol{dancers}{215}
 \Pisymbol{dancers}{44}	 \Pisymbol{dancers}{130}	 \Pisymbol{dancers}{216}
 \Pisymbol{dancers}{45}	 \Pisymbol{dancers}{131}	 \Pisymbol{dancers}{217}
 \Pisymbol{dancers}{46}	 \Pisymbol{dancers}{132}	 \Pisymbol{dancers}{218}
 \Pisymbol{dancers}{47}	 \Pisymbol{dancers}{133}	 \Pisymbol{dancers}{219}
 \Pisymbol{dancers}{48}	 \Pisymbol{dancers}{134}	 \Pisymbol{dancers}{220}
 \Pisymbol{dancers}{49}	 \Pisymbol{dancers}{135}	 \Pisymbol{dancers}{221}
 \Pisymbol{dancers}{50}	 \Pisymbol{dancers}{136}	 \Pisymbol{dancers}{222}
 \Pisymbol{dancers}{51}	 \Pisymbol{dancers}{137}	 \Pisymbol{dancers}{223}
 \Pisymbol{dancers}{52}	 \Pisymbol{dancers}{138}	 \Pisymbol{dancers}{224}
 \Pisymbol{dancers}{53}	 \Pisymbol{dancers}{139}	 \Pisymbol{dancers}{225}
 \Pisymbol{dancers}{54}	 \Pisymbol{dancers}{140}	 \Pisymbol{dancers}{226}
 \Pisymbol{dancers}{55}	 \Pisymbol{dancers}{141}	 \Pisymbol{dancers}{227}
 \Pisymbol{dancers}{56}	 \Pisymbol{dancers}{142}	 \Pisymbol{dancers}{228}
 \Pisymbol{dancers}{57}	 \Pisymbol{dancers}{143}	 \Pisymbol{dancers}{229}
 \Pisymbol{dancers}{58}	 \Pisymbol{dancers}{144}	 \Pisymbol{dancers}{230}
 \Pisymbol{dancers}{59}	 \Pisymbol{dancers}{145}	 \Pisymbol{dancers}{231}
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 \Pisymbol{dancers}{61}	 \Pisymbol{dancers}{147}	 \Pisymbol{dancers}{233}
 \Pisymbol{dancers}{62}	 \Pisymbol{dancers}{148}	 \Pisymbol{dancers}{234}
 \Pisymbol{dancers}{63}	 \Pisymbol{dancers}{149}	 \Pisymbol{dancers}{235}
 \Pisymbol{dancers}{64}	 \Pisymbol{dancers}{150}	 \Pisymbol{dancers}{236}
 \Pisymbol{dancers}{65}	 \Pisymbol{dancers}{151}	 \Pisymbol{dancers}{237}
 \Pisymbol{dancers}{66}	 \Pisymbol{dancers}{152}	 \Pisymbol{dancers}{238}
 \Pisymbol{dancers}{67}	 \Pisymbol{dancers}{153}	 \Pisymbol{dancers}{239}
 \Pisymbol{dancers}{68}	 \Pisymbol{dancers}{154}	 \Pisymbol{dancers}{240}
 \Pisymbol{dancers}{69}	 \Pisymbol{dancers}{155}	 \Pisymbol{dancers}{241}
 \Pisymbol{dancers}{70}	 \Pisymbol{dancers}{156}	 \Pisymbol{dancers}{242}
 \Pisymbol{dancers}{71}	 \Pisymbol{dancers}{157}	 \Pisymbol{dancers}{243}

































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	<code>\Pisymbol{dancers}{72}</code>		<code>\Pisymbol{dancers}{158}</code>		<code>\Pisymbol{dancers}{244}</code>
	<code>\Pisymbol{dancers}{73}</code>		<code>\Pisymbol{dancers}{159}</code>		<code>\Pisymbol{dancers}{245}</code>
	<code>\Pisymbol{dancers}{74}</code>		<code>\Pisymbol{dancers}{160}</code>		<code>\Pisymbol{dancers}{246}</code>
	<code>\Pisymbol{dancers}{75}</code>		<code>\Pisymbol{dancers}{161}</code>		<code>\Pisymbol{dancers}{247}</code>
	<code>\Pisymbol{dancers}{76}</code>		<code>\Pisymbol{dancers}{162}</code>		<code>\Pisymbol{dancers}{248}</code>
	<code>\Pisymbol{dancers}{77}</code>		<code>\Pisymbol{dancers}{163}</code>		<code>\Pisymbol{dancers}{249}</code>
	<code>\Pisymbol{dancers}{78}</code>		<code>\Pisymbol{dancers}{164}</code>		<code>\Pisymbol{dancers}{250}</code>
	<code>\Pisymbol{dancers}{79}</code>		<code>\Pisymbol{dancers}{165}</code>		<code>\Pisymbol{dancers}{251}</code>
	<code>\Pisymbol{dancers}{80}</code>		<code>\Pisymbol{dancers}{166}</code>		<code>\Pisymbol{dancers}{252}</code>
	<code>\Pisymbol{dancers}{81}</code>		<code>\Pisymbol{dancers}{167}</code>		<code>\Pisymbol{dancers}{253}</code>
	<code>\Pisymbol{dancers}{82}</code>		<code>\Pisymbol{dancers}{168}</code>		<code>\Pisymbol{dancers}{254}</code>
	<code>\Pisymbol{dancers}{83}</code>		<code>\Pisymbol{dancers}{169}</code>		<code>\Pisymbol{dancers}{255}</code>
	<code>\Pisymbol{dancers}{84}</code>		<code>\Pisymbol{dancers}{170}</code>		
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






































































































































Fans of Sherlock Holmes mysteries will recognize these glyphs as forming the substitution cipher featured in Sir Arthur Conan Doyle’s *The Adventure of the Dancing Men* (1903).

TABLE 680: semaphor Semaphore Alphabet

	<code>\Pisymbol{smfpr10}{34}</code>		<code>\Pisymbol{smfpr10}{116}</code>		<code>\Pisymbol{smfpr10}{184}</code>
	<code>\Pisymbol{smfpr10}{35}</code>		<code>\Pisymbol{smfpr10}{117}</code>		<code>\Pisymbol{smfpr10}{185}</code>
	<code>\Pisymbol{smfpr10}{36}</code>		<code>\Pisymbol{smfpr10}{118}</code>		<code>\Pisymbol{smfpr10}{186}</code>
	<code>\Pisymbol{smfpr10}{42}</code>		<code>\Pisymbol{smfpr10}{119}</code>		<code>\Pisymbol{smfpr10}{187}</code>
	<code>\Pisymbol{smfpr10}{46}</code>		<code>\Pisymbol{smfpr10}{120}</code>		<code>\Pisymbol{smfpr10}{192}</code>
	<code>\Pisymbol{smfpr10}{48}</code>		<code>\Pisymbol{smfpr10}{121}</code>		<code>\Pisymbol{smfpr10}{193}</code>
	<code>\Pisymbol{smfpr10}{49}</code>		<code>\Pisymbol{smfpr10}{122}</code>		<code>\Pisymbol{smfpr10}{194}</code>
	<code>\Pisymbol{smfpr10}{50}</code>		<code>\Pisymbol{smfpr10}{126}</code>		<code>\Pisymbol{smfpr10}{195}</code>
	<code>\Pisymbol{smfpr10}{51}</code>		<code>\Pisymbol{smfpr10}{128}</code>		<code>\Pisymbol{smfpr10}{196}</code>
	<code>\Pisymbol{smfpr10}{52}</code>		<code>\Pisymbol{smfpr10}{129}</code>		<code>\Pisymbol{smfpr10}{197}</code>
	<code>\Pisymbol{smfpr10}{53}</code>		<code>\Pisymbol{smfpr10}{130}</code>		<code>\Pisymbol{smfpr10}{199}</code>

(continued on next page)

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	<code>\Pisymbol{smfpr10}{54}</code>		<code>\Pisymbol{smfpr10}{131}</code>		<code>\Pisymbol{smfpr10}{200}</code>
	<code>\Pisymbol{smfpr10}{55}</code>		<code>\Pisymbol{smfpr10}{132}</code>		<code>\Pisymbol{smfpr10}{201}</code>
	<code>\Pisymbol{smfpr10}{56}</code>		<code>\Pisymbol{smfpr10}{133}</code>		<code>\Pisymbol{smfpr10}{202}</code>
	<code>\Pisymbol{smfpr10}{57}</code>		<code>\Pisymbol{smfpr10}{134}</code>		<code>\Pisymbol{smfpr10}{203}</code>
	<code>\Pisymbol{smfpr10}{65}</code>		<code>\Pisymbol{smfpr10}{135}</code>		<code>\Pisymbol{smfpr10}{204}</code>
	<code>\Pisymbol{smfpr10}{66}</code>		<code>\Pisymbol{smfpr10}{136}</code>		<code>\Pisymbol{smfpr10}{205}</code>
	<code>\Pisymbol{smfpr10}{67}</code>		<code>\Pisymbol{smfpr10}{137}</code>		<code>\Pisymbol{smfpr10}{206}</code>
	<code>\Pisymbol{smfpr10}{68}</code>		<code>\Pisymbol{smfpr10}{138}</code>		<code>\Pisymbol{smfpr10}{207}</code>
	<code>\Pisymbol{smfpr10}{69}</code>		<code>\Pisymbol{smfpr10}{139}</code>		<code>\Pisymbol{smfpr10}{209}</code>
	<code>\Pisymbol{smfpr10}{70}</code>		<code>\Pisymbol{smfpr10}{140}</code>		<code>\Pisymbol{smfpr10}{210}</code>
	<code>\Pisymbol{smfpr10}{71}</code>		<code>\Pisymbol{smfpr10}{142}</code>		<code>\Pisymbol{smfpr10}{211}</code>
	<code>\Pisymbol{smfpr10}{72}</code>		<code>\Pisymbol{smfpr10}{143}</code>		<code>\Pisymbol{smfpr10}{212}</code>
	<code>\Pisymbol{smfpr10}{73}</code>		<code>\Pisymbol{smfpr10}{144}</code>		<code>\Pisymbol{smfpr10}{213}</code>
	<code>\Pisymbol{smfpr10}{74}</code>		<code>\Pisymbol{smfpr10}{145}</code>		<code>\Pisymbol{smfpr10}{214}</code>
	<code>\Pisymbol{smfpr10}{75}</code>		<code>\Pisymbol{smfpr10}{146}</code>		<code>\Pisymbol{smfpr10}{216}</code>
	<code>\Pisymbol{smfpr10}{76}</code>		<code>\Pisymbol{smfpr10}{147}</code>		<code>\Pisymbol{smfpr10}{217}</code>
	<code>\Pisymbol{smfpr10}{77}</code>		<code>\Pisymbol{smfpr10}{148}</code>		<code>\Pisymbol{smfpr10}{218}</code>
	<code>\Pisymbol{smfpr10}{78}</code>		<code>\Pisymbol{smfpr10}{149}</code>		<code>\Pisymbol{smfpr10}{219}</code>
	<code>\Pisymbol{smfpr10}{79}</code>		<code>\Pisymbol{smfpr10}{150}</code>		<code>\Pisymbol{smfpr10}{220}</code>
	<code>\Pisymbol{smfpr10}{80}</code>		<code>\Pisymbol{smfpr10}{151}</code>		<code>\Pisymbol{smfpr10}{221}</code>
	<code>\Pisymbol{smfpr10}{81}</code>		<code>\Pisymbol{smfpr10}{152}</code>		<code>\Pisymbol{smfpr10}{224}</code>
	<code>\Pisymbol{smfpr10}{82}</code>		<code>\Pisymbol{smfpr10}{153}</code>		<code>\Pisymbol{smfpr10}{225}</code>
	<code>\Pisymbol{smfpr10}{83}</code>		<code>\Pisymbol{smfpr10}{154}</code>		<code>\Pisymbol{smfpr10}{226}</code>
	<code>\Pisymbol{smfpr10}{84}</code>		<code>\Pisymbol{smfpr10}{155}</code>		<code>\Pisymbol{smfpr10}{227}</code>
	<code>\Pisymbol{smfpr10}{85}</code>		<code>\Pisymbol{smfpr10}{157}</code>		<code>\Pisymbol{smfpr10}{228}</code>
	<code>\Pisymbol{smfpr10}{86}</code>		<code>\Pisymbol{smfpr10}{158}</code>		<code>\Pisymbol{smfpr10}{229}</code>
	<code>\Pisymbol{smfpr10}{87}</code>		<code>\Pisymbol{smfpr10}{160}</code>		<code>\Pisymbol{smfpr10}{231}</code>
	<code>\Pisymbol{smfpr10}{88}</code>		<code>\Pisymbol{smfpr10}{161}</code>		<code>\Pisymbol{smfpr10}{232}</code>
	<code>\Pisymbol{smfpr10}{89}</code>		<code>\Pisymbol{smfpr10}{162}</code>		<code>\Pisymbol{smfpr10}{233}</code>
	<code>\Pisymbol{smfpr10}{90}</code>		<code>\Pisymbol{smfpr10}{163}</code>		<code>\Pisymbol{smfpr10}{234}</code>
	<code>\Pisymbol{smfpr10}{97}</code>		<code>\Pisymbol{smfpr10}{164}</code>		<code>\Pisymbol{smfpr10}{235}</code>
	<code>\Pisymbol{smfpr10}{98}</code>		<code>\Pisymbol{smfpr10}{165}</code>		<code>\Pisymbol{smfpr10}{236}</code>
	<code>\Pisymbol{smfpr10}{99}</code>		<code>\Pisymbol{smfpr10}{166}</code>		<code>\Pisymbol{smfpr10}{237}</code>
	<code>\Pisymbol{smfpr10}{100}</code>		<code>\Pisymbol{smfpr10}{167}</code>		<code>\Pisymbol{smfpr10}{238}</code>
	<code>\Pisymbol{smfpr10}{101}</code>		<code>\Pisymbol{smfpr10}{168}</code>		<code>\Pisymbol{smfpr10}{239}</code>
	<code>\Pisymbol{smfpr10}{102}</code>		<code>\Pisymbol{smfpr10}{169}</code>		<code>\Pisymbol{smfpr10}{241}</code>
	<code>\Pisymbol{smfpr10}{103}</code>		<code>\Pisymbol{smfpr10}{170}</code>		<code>\Pisymbol{smfpr10}{242}</code>
	<code>\Pisymbol{smfpr10}{104}</code>		<code>\Pisymbol{smfpr10}{171}</code>		<code>\Pisymbol{smfpr10}{243}</code>
	<code>\Pisymbol{smfpr10}{105}</code>		<code>\Pisymbol{smfpr10}{172}</code>		<code>\Pisymbol{smfpr10}{244}</code>
	<code>\Pisymbol{smfpr10}{106}</code>		<code>\Pisymbol{smfpr10}{174}</code>		<code>\Pisymbol{smfpr10}{245}</code>
	<code>\Pisymbol{smfpr10}{107}</code>		<code>\Pisymbol{smfpr10}{175}</code>		<code>\Pisymbol{smfpr10}{246}</code>
	<code>\Pisymbol{smfpr10}{108}</code>		<code>\Pisymbol{smfpr10}{176}</code>		<code>\Pisymbol{smfpr10}{248}</code>
	<code>\Pisymbol{smfpr10}{109}</code>		<code>\Pisymbol{smfpr10}{177}</code>		<code>\Pisymbol{smfpr10}{249}</code>
	<code>\Pisymbol{smfpr10}{110}</code>		<code>\Pisymbol{smfpr10}{178}</code>		<code>\Pisymbol{smfpr10}{250}</code>
	<code>\Pisymbol{smfpr10}{111}</code>		<code>\Pisymbol{smfpr10}{179}</code>		<code>\Pisymbol{smfpr10}{251}</code>

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	<code>\Pisymbol{smfpr10}{112}</code>		<code>\Pisymbol{smfpr10}{180}</code>		<code>\Pisymbol{smfpr10}{252}</code>
	<code>\Pisymbol{smfpr10}{113}</code>		<code>\Pisymbol{smfpr10}{181}</code>		<code>\Pisymbol{smfpr10}{253}</code>
	<code>\Pisymbol{smfpr10}{114}</code>		<code>\Pisymbol{smfpr10}{182}</code>		
	<code>\Pisymbol{smfpr10}{115}</code>		<code>\Pisymbol{smfpr10}{183}</code>		

semaphor provides a `semaf.fd` font-definition file. Instead of using `pifont` and `\Pisymbol` to typeset a glyph, a document can select the `semaphor` fonts directly, although this does require putting `\input{semaf.fd}` in the document’s preamble. For example, `{\usefont{OT1}{smfp}{m}{n}Hello}` will typeset “”. This can be useful for typesetting complete messages. Roman, bold, monospace, slanted, and bold+slanted styles are all supported.

In addition, `semaphor` provides three variations of each font: a “person” version (`smfpr10`), which is what is illustrated in the preceding table, a “pillar” version (`smfr10`), which shows the flags on a pillar rather than being held by a person, and an “empty” version (`smfer10`), which shows only the flags and no pillar or person. Contrast these variations of the letter “H”:
















TABLE 681: lcircuit Logic Gates and VLSI Symbols

	<code>\usebox{\ande}</code>		<code>\usebox{\nfete}</code>		<code>\usebox{\ots}</code>
	<code>\usebox{\andn}</code>		<code>\usebox{\nfetn}</code>		<code>\usebox{\otw}</code>
	<code>\usebox{\ands}</code>		<code>\usebox{\nfets}</code>		<code>\usebox{\pfete}</code>
	<code>\usebox{\andw}</code>		<code>\usebox{\nfetw}</code>		<code>\usebox{\pfetn}</code>
	<code>\usebox{\capew}</code>		<code>\usebox{\nore}</code>		<code>\usebox{\pfets}</code>
	<code>\usebox{\capns}</code>		<code>\usebox{\norn}</code>		<code>\usebox{\pfetw}</code>
	<code>\usebox{\exore}</code>		<code>\usebox{\nors}</code>		<code>\usebox{\resew}</code>
	<code>\usebox{\exorn}</code>		<code>\usebox{\norw}</code>		<code>\usebox{\resns}</code>
	<code>\usebox{\exors}</code>		<code>\usebox{\note}</code>		<code>\usebox{\tgateew}</code>
	<code>\usebox{\exorw}</code>		<code>\usebox{\notn}</code>		<code>\usebox{\tgatens}</code>
	<code>\usebox{\nande}</code>		<code>\usebox{\nots}</code>		<code>\usebox{\tje}</code>
	<code>\usebox{\nandn}</code>		<code>\usebox{\notw}</code>		<code>\usebox{\tjn}</code>
	<code>\usebox{\nands}</code>		<code>\usebox{\ore}</code>		<code>\usebox{\tjs}</code>

(continued on next page)

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	<code>\usebox{\nandw}</code>		<code>\usebox{\orn}</code>		<code>\usebox{\tjw}</code>
	<code>\usebox{\nexore}</code>		<code>\usebox{\ors}</code>		<code>\usebox{\vddpin}</code>
	<code>\usebox{\nexorn}</code>		<code>\usebox{\orw}</code>		<code>\usebox{\vsspin}</code>
	<code>\usebox{\nexors}</code>		<code>\usebox{\ote}</code>		
	<code>\usebox{\nexorw}</code>		<code>\usebox{\otn}</code>		

Each of these symbols first must be defined via an `\input` of the corresponding `.mac` file. For example, before a document can invoke `\usebox{\nande}` it first must `\input{nande.mac}`.

All `lcircuit` symbols are defined using a L<sup>A</sup>T<sub>E</sub>X `picture` environment, not a font.

TABLE 682: `cryst` Crystallography Symbols

◦	<code>\Pisymbol{cryst}{0}</code>	◆	<code>\Pisymbol{cryst}{63}</code>	↙	<code>\Pisymbol{cryst}{138}</code>
●	<code>\Pisymbol{cryst}{2}</code>	◆	<code>\Pisymbol{cryst}{64}</code>	↘	<code>\Pisymbol{cryst}{139}</code>
▲	<code>\Pisymbol{cryst}{3}</code>	◆	<code>\Pisymbol{cryst}{65}</code>	■	<code>\Pisymbol{cryst}{140}</code>
◆	<code>\Pisymbol{cryst}{4}</code>	◆	<code>\Pisymbol{cryst}{66}</code>	⬇	<code>\Pisymbol{cryst}{141}</code>
↖	<code>\Pisymbol{cryst}{5}</code>	↖	<code>\Pisymbol{cryst}{75}</code>	↗	<code>\Pisymbol{cryst}{142}</code>
●	<code>\Pisymbol{cryst}{6}</code>	↖	<code>\Pisymbol{cryst}{77}</code>	⬆	<code>\Pisymbol{cryst}{143}</code>
→	<code>\Pisymbol{cryst}{7}</code>	↖	<code>\Pisymbol{cryst}{78}</code>	↘	<code>\Pisymbol{cryst}{145}</code>
↗	<code>\Pisymbol{cryst}{8}</code>	↖	<code>\Pisymbol{cryst}{79}</code>	↘	<code>\Pisymbol{cryst}{147}</code>
→	<code>\Pisymbol{cryst}{9}</code>	■	<code>\Pisymbol{cryst}{80}</code>	↙	<code>\Pisymbol{cryst}{148}</code>
◦	<code>\Pisymbol{cryst}{10}</code>	■	<code>\Pisymbol{cryst}{81}</code>	↘	<code>\Pisymbol{cryst}{149}</code>
∅	<code>\Pisymbol{cryst}{12}</code>	■	<code>\Pisymbol{cryst}{82}</code>	↓	<code>\Pisymbol{cryst}{155}</code>
◆	<code>\Pisymbol{cryst}{15}</code>	■	<code>\Pisymbol{cryst}{83}</code>	↓	<code>\Pisymbol{cryst}{157}</code>
∅	<code>\Pisymbol{cryst}{20}</code>	■	<code>\Pisymbol{cryst}{84}</code>	↓	<code>\Pisymbol{cryst}{158}</code>
∅	<code>\Pisymbol{cryst}{21}</code>	↖	<code>\Pisymbol{cryst}{85}</code>	↓	<code>\Pisymbol{cryst}{159}</code>
●	<code>\Pisymbol{cryst}{22}</code>	↖	<code>\Pisymbol{cryst}{87}</code>	↖	<code>\Pisymbol{cryst}{175}</code>
◆	<code>\Pisymbol{cryst}{24}</code>	↖	<code>\Pisymbol{cryst}{88}</code>	↖	<code>\Pisymbol{cryst}{177}</code>
↗	<code>\Pisymbol{cryst}{25}</code>	↖	<code>\Pisymbol{cryst}{89}</code>	↖	<code>\Pisymbol{cryst}{178}</code>
↗	<code>\Pisymbol{cryst}{27}</code>	↖	<code>\Pisymbol{cryst}{95}</code>	↖	<code>\Pisymbol{cryst}{179}</code>
↗	<code>\Pisymbol{cryst}{28}</code>	↖	<code>\Pisymbol{cryst}{97}</code>	↖	<code>\Pisymbol{cryst}{185}</code>
↗	<code>\Pisymbol{cryst}{29}</code>	↖	<code>\Pisymbol{cryst}{98}</code>	↖	<code>\Pisymbol{cryst}{187}</code>
▲	<code>\Pisymbol{cryst}{30}</code>	↖	<code>\Pisymbol{cryst}{99}</code>	↖	<code>\Pisymbol{cryst}{188}</code>
▲	<code>\Pisymbol{cryst}{31}</code>	↖	<code>\Pisymbol{cryst}{102}</code>	↖	<code>\Pisymbol{cryst}{189}</code>
▲	<code>\Pisymbol{cryst}{32}</code>	↖	<code>\Pisymbol{cryst}{103}</code>	↖	<code>\Pisymbol{cryst}{195}</code>
↗	<code>\Pisymbol{cryst}{35}</code>	↖	<code>\Pisymbol{cryst}{104}</code>	↖	<code>\Pisymbol{cryst}{197}</code>
●	<code>\Pisymbol{cryst}{36}</code>	↖	<code>\Pisymbol{cryst}{105}</code>	↖	<code>\Pisymbol{cryst}{198}</code>































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	<code>\Pisymbol{cryst}{37}</code>		<code>\Pisymbol{cryst}{107}</code>		<code>\Pisymbol{cryst}{199}</code>
	<code>\Pisymbol{cryst}{38}</code>		<code>\Pisymbol{cryst}{108}</code>		<code>\Pisymbol{cryst}{202}</code>
	<code>\Pisymbol{cryst}{39}</code>		<code>\Pisymbol{cryst}{109}</code>		<code>\Pisymbol{cryst}{203}</code>
	<code>\Pisymbol{cryst}{40}</code>		<code>\Pisymbol{cryst}{112}</code>		<code>\Pisymbol{cryst}{204}</code>
	<code>\Pisymbol{cryst}{41}</code>		<code>\Pisymbol{cryst}{113}</code>		<code>\Pisymbol{cryst}{210}</code>
	<code>\Pisymbol{cryst}{42}</code>		<code>\Pisymbol{cryst}{120}</code>		<code>\Pisymbol{cryst}{212}</code>
	<code>\Pisymbol{cryst}{43}</code>		<code>\Pisymbol{cryst}{121}</code>		<code>\Pisymbol{cryst}{213}</code>
	<code>\Pisymbol{cryst}{44}</code>		<code>\Pisymbol{cryst}{123}</code>		<code>\Pisymbol{cryst}{220}</code>
	<code>\Pisymbol{cryst}{45}</code>		<code>\Pisymbol{cryst}{124}</code>		<code>\Pisymbol{cryst}{221}</code>
	<code>\Pisymbol{cryst}{47}</code>		<code>\Pisymbol{cryst}{125}</code>		<code>\Pisymbol{cryst}{223}</code>
	<code>\Pisymbol{cryst}{48}</code>		<code>\Pisymbol{cryst}{127}</code>		<code>\Pisymbol{cryst}{224}</code>
	<code>\Pisymbol{cryst}{49}</code>		<code>\Pisymbol{cryst}{128}</code>		<code>\Pisymbol{cryst}{230}</code>
	<code>\Pisymbol{cryst}{50}</code>		<code>\Pisymbol{cryst}{129}</code>		<code>\Pisymbol{cryst}{231}</code>
	<code>\Pisymbol{cryst}{55}</code>		<code>\Pisymbol{cryst}{130}</code>		<code>\Pisymbol{cryst}{232}</code>
	<code>\Pisymbol{cryst}{57}</code>		<code>\Pisymbol{cryst}{131}</code>		<code>\Pisymbol{cryst}{233}</code>
	<code>\Pisymbol{cryst}{58}</code>		<code>\Pisymbol{cryst}{132}</code>		<code>\Pisymbol{cryst}{236}</code>
	<code>\Pisymbol{cryst}{59}</code>		<code>\Pisymbol{cryst}{133}</code>		<code>\Pisymbol{cryst}{240}</code>
	<code>\Pisymbol{cryst}{60}</code>		<code>\Pisymbol{cryst}{135}</code>		<code>\Pisymbol{cryst}{241}</code>
	<code>\Pisymbol{cryst}{61}</code>		<code>\Pisymbol{cryst}{136}</code>		<code>\Pisymbol{cryst}{242}</code>
	<code>\Pisymbol{cryst}{62}</code>		<code>\Pisymbol{cryst}{137}</code>		<code>\Pisymbol{cryst}{243}</code>

TABLE 683: dice Dice

	<code>\Pisymbol{dice3d}{49}</code>		<code>\Pisymbol{dice3d}{101}</code>		<code>\Pisymbol{dice3d}{111}</code>
	<code>\Pisymbol{dice3d}{50}</code>		<code>\Pisymbol{dice3d}{102}</code>		<code>\Pisymbol{dice3d}{112}</code>
	<code>\Pisymbol{dice3d}{51}</code>		<code>\Pisymbol{dice3d}{103}</code>		<code>\Pisymbol{dice3d}{113}</code>
	<code>\Pisymbol{dice3d}{52}</code>		<code>\Pisymbol{dice3d}{104}</code>		<code>\Pisymbol{dice3d}{114}</code>
	<code>\Pisymbol{dice3d}{53}</code>		<code>\Pisymbol{dice3d}{105}</code>		<code>\Pisymbol{dice3d}{115}</code>
	<code>\Pisymbol{dice3d}{54}</code>		<code>\Pisymbol{dice3d}{106}</code>		<code>\Pisymbol{dice3d}{116}</code>
	<code>\Pisymbol{dice3d}{97}</code>		<code>\Pisymbol{dice3d}{107}</code>		<code>\Pisymbol{dice3d}{117}</code>
	<code>\Pisymbol{dice3d}{98}</code>		<code>\Pisymbol{dice3d}{108}</code>		<code>\Pisymbol{dice3d}{118}</code>
	<code>\Pisymbol{dice3d}{99}</code>		<code>\Pisymbol{dice3d}{109}</code>		<code>\Pisymbol{dice3d}{119}</code>
	<code>\Pisymbol{dice3d}{100}</code>		<code>\Pisymbol{dice3d}{110}</code>		<code>\Pisymbol{dice3d}{120}</code>

dice defines its symbols at a very small design size. The glyphs shown above were scaled up by a factor of four using `\DeclareFontShape{U}{dice3d}{m}{n}{<-> s*[4] dice3d}{}`.







An alternative to using `\Pisymbol` to select a die rotation is to rely on some cleverness in the kerning tables provided by the dice font. The individual digits “1” through “6” each produce the corresponding (2D) die face: `{\usefont{U}{dice3d}{m}{n}2 2 1}` produces “  ”, for example. When followed by a letter “a” through “d”, those pairs are kerned to produce a 3D die rotation with the digit specifying by the top face and the letter specifying one of the four possible front faces, sorted by increasing value. For example, `{\usefont{U}{dice3d}{m}{n}2a 2b 1d}` produces “  ”.

TABLE 684: figbas Figured-Bass Ligatures

2̣	<code>\Pisymbol{figbas}{50}</code>	Ɔ	<code>\Pisymbol{figbas}{54}</code>
4̣	<code>\Pisymbol{figbas}{52}</code>	Q	<code>\Pisymbol{figbas}{57}</code>
5̣	<code>\Pisymbol{figbas}{53}</code>		

Shown here are the figured-bass ligatures based on Computer Modern. figbas additionally provides versions of these symbols based on Computer Modern Sans and Palatino/Palladio.

`{\usefont{U}{figbas}{m}{n}2 4 5 6 9}` is an equivalent means of producing these symbols.




























TABLE 685: magic Trading Card Symbols

①	<code>\Pisymbol{magic}{48}</code>	⑥	<code>\Pisymbol{magic}{54}</code>	☯	<code>\Pisymbol{magic}{82}</code>
②	<code>\Pisymbol{magic}{49}</code>	⑦	<code>\Pisymbol{magic}{55}</code>	⌘	<code>\Pisymbol{magic}{84}</code>
③	<code>\Pisymbol{magic}{50}</code>	⑧	<code>\Pisymbol{magic}{56}</code>	♁	<code>\Pisymbol{magic}{85}</code>
④	<code>\Pisymbol{magic}{51}</code>	⑨	<code>\Pisymbol{magic}{57}</code>	⊗	<code>\Pisymbol{magic}{87}</code>
⑤	<code>\Pisymbol{magic}{52}</code>	♁	<code>\Pisymbol{magic}{66}</code>	⊗	<code>\Pisymbol{magic}{88}</code>
	<code>\Pisymbol{magic}{53}</code>	♁	<code>\Pisymbol{magic}{71}</code>	⑩	<code>\Pisymbol{magic}{90}</code>

The preceding symbols resemble those from Wizards of the Coast’s *Magic: The Gathering* trading-card game. An alternative to entering symbols numerically using `\Pisymbol` is to switch to the magic font with `\usefont{U}{magic}{m}{n}` and employ the following mnemonic characters:






















































































































①–⑨	0–9	Circled numerals 0–9
♁	B	Black magic symbol
♁	G	Green magic symbol
☯	R	Red magic symbol
⌘	T	Tap symbol (tilted “T” in a circle)
♁	U	Blue magic symbol
⊗	W	White magic symbol
⊗	X	Circled “X” (for mana cost, e.g., Fireball)
⑩	Z	Circled “10” (for mana cost, e.g., Aladdin’s Lamp)

TABLE 686: bartel-chess-fonts Chess Pieces and Chessboard Squares

	<code>\Pisymbol{fselch}{0}</code>		<code>\Pisymbol{fselch}{55}</code>		<code>\Pisymbol{fselch}{110}</code>
	<code>\Pisymbol{fselch}{1}</code>		<code>\Pisymbol{fselch}{56}</code>		<code>\Pisymbol{fselch}{111}</code>
	<code>\Pisymbol{fselch}{2}</code>		<code>\Pisymbol{fselch}{57}</code>		<code>\Pisymbol{fselch}{112}</code>
	<code>\Pisymbol{fselch}{3}</code>		<code>\Pisymbol{fselch}{58}</code>		<code>\Pisymbol{fselch}{113}</code>
	<code>\Pisymbol{fselch}{4}</code>		<code>\Pisymbol{fselch}{59}</code>		<code>\Pisymbol{fselch}{114}</code>
	<code>\Pisymbol{fselch}{5}</code>		<code>\Pisymbol{fselch}{60}</code>		<code>\Pisymbol{fselch}{115}</code>
	<code>\Pisymbol{fselch}{6}</code>		<code>\Pisymbol{fselch}{61}</code>		<code>\Pisymbol{fselch}{116}</code>
	<code>\Pisymbol{fselch}{7}</code>		<code>\Pisymbol{fselch}{62}</code>		<code>\Pisymbol{fselch}{117}</code>
	<code>\Pisymbol{fselch}{8}</code>		<code>\Pisymbol{fselch}{63}</code>		<code>\Pisymbol{fselch}{118}</code>
	<code>\Pisymbol{fselch}{9}</code>		<code>\Pisymbol{fselch}{64}</code>		<code>\Pisymbol{fselch}{119}</code>
	<code>\Pisymbol{fselch}{10}</code>		<code>\Pisymbol{fselch}{65}</code>		<code>\Pisymbol{fselch}{120}</code>
	<code>\Pisymbol{fselch}{11}</code>		<code>\Pisymbol{fselch}{66}</code>		<code>\Pisymbol{fselch}{121}</code>
	<code>\Pisymbol{fselch}{12}</code>		<code>\Pisymbol{fselch}{67}</code>		<code>\Pisymbol{fselch}{122}</code>


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	<code>\Pisymbol{fselch}{13}</code>		<code>\Pisymbol{fselch}{68}</code>		<code>\Pisymbol{fselch}{123}</code>
	<code>\Pisymbol{fselch}{14}</code>		<code>\Pisymbol{fselch}{69}</code>		<code>\Pisymbol{fselch}{124}</code>
	<code>\Pisymbol{fselch}{15}</code>		<code>\Pisymbol{fselch}{70}</code>		<code>\Pisymbol{fselch}{125}</code>
	<code>\Pisymbol{fselch}{16}</code>		<code>\Pisymbol{fselch}{71}</code>		<code>\Pisymbol{fselch}{126}</code>
	<code>\Pisymbol{fselch}{17}</code>		<code>\Pisymbol{fselch}{72}</code>		<code>\Pisymbol{fselch}{127}</code>
	<code>\Pisymbol{fselch}{18}</code>		<code>\Pisymbol{fselch}{73}</code>		<code>\Pisymbol{fselch}{128}</code>
	<code>\Pisymbol{fselch}{19}</code>		<code>\Pisymbol{fselch}{74}</code>		<code>\Pisymbol{fselch}{129}</code>
	<code>\Pisymbol{fselch}{20}</code>		<code>\Pisymbol{fselch}{75}</code>		<code>\Pisymbol{fselch}{130}</code>
	<code>\Pisymbol{fselch}{21}</code>		<code>\Pisymbol{fselch}{76}</code>		<code>\Pisymbol{fselch}{131}</code>
	<code>\Pisymbol{fselch}{22}</code>		<code>\Pisymbol{fselch}{77}</code>		<code>\Pisymbol{fselch}{132}</code>
	<code>\Pisymbol{fselch}{23}</code>		<code>\Pisymbol{fselch}{78}</code>		<code>\Pisymbol{fselch}{133}</code>
	<code>\Pisymbol{fselch}{24}</code>		<code>\Pisymbol{fselch}{79}</code>		<code>\Pisymbol{fselch}{134}</code>
	<code>\Pisymbol{fselch}{25}</code>		<code>\Pisymbol{fselch}{80}</code>		<code>\Pisymbol{fselch}{135}</code>
	<code>\Pisymbol{fselch}{26}</code>		<code>\Pisymbol{fselch}{81}</code>		<code>\Pisymbol{fselch}{136}</code>
	<code>\Pisymbol{fselch}{27}</code>		<code>\Pisymbol{fselch}{82}</code>		<code>\Pisymbol{fselch}{137}</code>
	<code>\Pisymbol{fselch}{28}</code>		<code>\Pisymbol{fselch}{83}</code>		<code>\Pisymbol{fselch}{138}</code>
	<code>\Pisymbol{fselch}{29}</code>		<code>\Pisymbol{fselch}{84}</code>		<code>\Pisymbol{fselch}{139}</code>
	<code>\Pisymbol{fselch}{30}</code>		<code>\Pisymbol{fselch}{85}</code>		<code>\Pisymbol{fselch}{140}</code>
	<code>\Pisymbol{fselch}{31}</code>		<code>\Pisymbol{fselch}{86}</code>		<code>\Pisymbol{fselch}{141}</code>
	<code>\Pisymbol{fselch}{32}</code>		<code>\Pisymbol{fselch}{87}</code>		<code>\Pisymbol{fselch}{142}</code>
	<code>\Pisymbol{fselch}{33}</code>		<code>\Pisymbol{fselch}{88}</code>		<code>\Pisymbol{fselch}{143}</code>
	<code>\Pisymbol{fselch}{34}</code>		<code>\Pisymbol{fselch}{89}</code>		<code>\Pisymbol{fselch}{144}</code>
	<code>\Pisymbol{fselch}{35}</code>		<code>\Pisymbol{fselch}{90}</code>		<code>\Pisymbol{fselch}{145}</code>
	<code>\Pisymbol{fselch}{36}</code>		<code>\Pisymbol{fselch}{91}</code>		<code>\Pisymbol{fselch}{151}</code>
	<code>\Pisymbol{fselch}{37}</code>		<code>\Pisymbol{fselch}{92}</code>		<code>\Pisymbol{fselch}{157}</code>
	<code>\Pisymbol{fselch}{38}</code>		<code>\Pisymbol{fselch}{93}</code>		<code>\Pisymbol{fselch}{163}</code>
	<code>\Pisymbol{fselch}{39}</code>		<code>\Pisymbol{fselch}{94}</code>		<code>\Pisymbol{fselch}{169}</code>
	<code>\Pisymbol{fselch}{40}</code>		<code>\Pisymbol{fselch}{95}</code>		<code>\Pisymbol{fselch}{175}</code>
	<code>\Pisymbol{fselch}{41}</code>		<code>\Pisymbol{fselch}{96}</code>		<code>\Pisymbol{fselch}{180}</code>
	<code>\Pisymbol{fselch}{42}</code>		<code>\Pisymbol{fselch}{97}</code>		<code>\Pisymbol{fselch}{186}</code>
	<code>\Pisymbol{fselch}{43}</code>		<code>\Pisymbol{fselch}{98}</code>		<code>\Pisymbol{fselch}{192}</code>
	<code>\Pisymbol{fselch}{44}</code>		<code>\Pisymbol{fselch}{99}</code>		<code>\Pisymbol{fselch}{198}</code>
	<code>\Pisymbol{fselch}{45}</code>		<code>\Pisymbol{fselch}{100}</code>		<code>\Pisymbol{fselch}{204}</code>
	<code>\Pisymbol{fselch}{46}</code>		<code>\Pisymbol{fselch}{101}</code>		<code>\Pisymbol{fselch}{210}</code>
	<code>\Pisymbol{fselch}{47}</code>		<code>\Pisymbol{fselch}{102}</code>		<code>\Pisymbol{fselch}{216}</code>
	<code>\Pisymbol{fselch}{48}</code>		<code>\Pisymbol{fselch}{103}</code>		<code>\Pisymbol{fselch}{222}</code>
	<code>\Pisymbol{fselch}{49}</code>		<code>\Pisymbol{fselch}{104}</code>		<code>\Pisymbol{fselch}{228}</code>
	<code>\Pisymbol{fselch}{50}</code>		<code>\Pisymbol{fselch}{105}</code>		<code>\Pisymbol{fselch}{234}</code>
	<code>\Pisymbol{fselch}{51}</code>		<code>\Pisymbol{fselch}{106}</code>		<code>\Pisymbol{fselch}{240}</code>
	<code>\Pisymbol{fselch}{52}</code>		<code>\Pisymbol{fselch}{107}</code>		<code>\Pisymbol{fselch}{246}</code>

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	<code>\Pisymbol{fselch}{53}</code>		<code>\Pisymbol{fselch}{108}</code>
	<code>\Pisymbol{fselch}{54}</code>		<code>\Pisymbol{fselch}{109}</code>

In addition to the `fselch` font showcased above, `bartel-chess-fonts` also provides a `pkelch` font which includes the same symbol set (minus some of the higher-numbered characters) but drawn in a slightly different style.

`bartel-chess-fonts` provides the `fselch` and `pkelch` fonts in various sizes (optically scaled). See “L<sup>A</sup>T<sub>E</sub>X<sub>2</sub> $\epsilon$  Font Selection” [LAT19] for advice on how to expose these sorts of fonts to L<sup>A</sup>T<sub>E</sub>X using `\DeclareFontFamily` and `\DeclareFontShape`.

## Chapter 12

# Additional Information

Unlike the previous chapters of this document, Chapter 12 does not contain new symbol tables. Rather, it provides additional help in using the Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List. First, it draws attention to symbol names used by multiple packages. Next, it provides some guidelines for finding symbols and gives some examples regarding how to construct missing symbols out of existing ones. Then, it comments on the spacing surrounding symbols in math mode. After that, it presents an ASCII and Latin 1 quick-reference guide, showing how to enter all of the standard ASCII/Latin 1 symbols in L<sup>A</sup>T<sub>E</sub>X. And finally, it lists some statistics about this document itself.

### 12.1 Symbol Name Clashes

Unfortunately, a number of symbol names are not unique; they appear in more than one package. Depending on how the symbols are defined in each package, L<sup>A</sup>T<sub>E</sub>X will either output an error message or replace an earlier-defined symbol with a later-defined symbol. Table 687 on page 365 presents a selection of name clashes that appear in this document.

Using multiple symbols with the same name in the same document—or even merely loading conflicting symbol packages—can be tricky but, as evidenced by the existence of Table 687, not impossible. The general procedure is to load the first package, rename the conflicting symbols, and then load the second package. Examine the L<sup>A</sup>T<sub>E</sub>X source for this document (`symbols.tex`) for examples of this and other techniques for handling symbol conflicts. Note that `symbols.tex`'s `\savesymbol` and `\restoresymbol` macros have been extracted into the `savesym` package, which can be downloaded from CTAN.

`txfonts` and `pxfonts` redefine a huge number of symbols—essentially, all of the symbols defined by `latexsym`, `textcomp`, the various  $\mathcal{A}\mathcal{M}\mathcal{S}$  symbol sets, and L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> itself. Similarly, `mathabx` redefines a vast number of math symbols in an attempt to improve their look. The `txfonts`, `pxfonts`, and `mathabx` conflicts are not listed in Table 687 because they are designed to be compatible with the symbols they replace. Table 688 on page 366 illustrates what “compatible” means in this context.

To use the new `txfonts`/`pxfonts` symbols without altering the document's main font, merely reset the default font families back to their original values after loading one of those packages:

```
\renewcommand\rmdefault{cmr}  
\renewcommand\sfdefault{cmss}  
\renewcommand\ttdefault{cmtt}
```

TABLE 687: Symbol Name Clashes

Symbol	L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub>	A <sub>M</sub> S	stmaryrd	wasysym	mathabx	marvosym	bbding	ifsym	dingbat	wsuipa
<code>\baro</code>			φ							ϑ
<code>\bigtriangledown</code>	▽		▽							
<code>\bigtriangleup</code>	△		△							
<code>\checkmark</code>		✓							✓	
<code>\Circle</code>				○				○		
<code>\Cross</code>						†	†	×		
<code>\ggg</code>		»»			»					
<code>\Letter</code>						⊠		⊠		
<code>\lightning</code>			⚡	⚡						
<code>\Lightning</code>						⚡		⚡		
<code>\lll</code>		««			«					
<code>\Square</code>				□			□	□		
<code>\Sun</code>					☉	☉		☀		
<code>\TriangleDown</code>							▼	▽		
<code>\TriangleUp</code>							▲	△		

TABLE 688: Example of a Benign Name Clash

Symbol	Default (Computer Modern)	txfonts (Times Roman)
<code>R</code>	$\mathbb{R}$	$\mathbb{R}$
<code>\textrecipe</code>	$\mathbb{R}$	$\mathbb{R}$

## 12.2 Resizing symbols

Mathematical symbols listed in this document as “variable-sized” are designed to stretch vertically. Each variable-sized symbol comes in one or more basic sizes plus a variation comprising both stretchable and nonstretchable segments. Table 689 on page 366 presents the symbols `\}` and `\uparrow` in their default size, in their `\big`, `\Big`, `\bigg`, and `\Bigg` sizes, in an even larger size achieved using `\left/\right`, and—for contrast—in a large size achieved by changing the font size using L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>’s `\fontsize` command. Because the symbols shown belong to the Computer Modern family, the `typelcm` package needs to be loaded to support font sizes larger than 24.88 pt.

TABLE 689: Sample resized delimiters

Symbol	Default size	<code>\big</code>	<code>\Big</code>	<code>\bigg</code>	<code>\Bigg</code>	<code>\left/\right</code>	<code>\fontsize</code>
<code>\}</code>	}	}	}	}	}	}	}
<code>\uparrow</code>	↑	↑	↑	↑	↑	↑	↑

Note how `\fontsize` makes the symbol wider and thicker. (The `graphicx` package’s `\scalebox` or `\resizebox` commands would produce a similar effect.) Also, the `\fontsize`-enlarged symbol is vertically centered relative to correspondingly large text, unlike the symbols enlarged using `\big` et al. or `\left/\right`, which all use the same math axis regardless of symbol size. However, `\fontsize` is not limited to mathematical delimiters. Also, `\scalebox` and `\resizebox` are more robust to poorly composed symbols (e.g., two symbols made to overlap by backspacing a fixed distance) but do not work with every T<sub>E</sub>X backend and will produce jagged symbols when scaling a bitmapped font.

All variable-sized delimiters are defined (by the corresponding `.tfm` file) in terms of up to five segments, as illustrated by Figure 12.1 on the following page. The top, middle, and bottom segments are of a fixed size.



The top-middle and middle-bottom segments (which are constrained to be the same character) are repeated as many times as necessary to achieve the desired height.

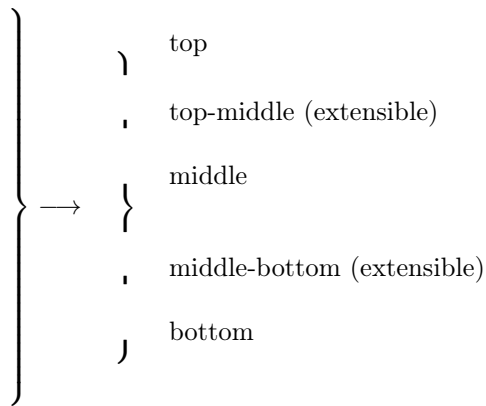


Figure 12.1: Implementation of variable-sized delimiters

### 12.3 Where can I find the symbol for ...?

If you can't find some symbol you're looking for in this document, there are a few possible explanations:

- The symbol isn't intuitively named. As a few examples, the `ifsym` command to draw dice is `\Cube`; a plus sign with a circle around it (“exclusive or” to computer engineers) is `\oplus`; and lightning bolts in fonts designed by German speakers may have “blitz” in their names as in the `ulsy` package. The moral of the story is to be creative with synonyms when searching the index.
- The symbol is defined by some package that I overlooked (or deemed unimportant). If there's some symbol package that you think should be included in the Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List, please send me e-mail at the address listed on the title page.
- The symbol isn't defined in any package whatsoever.

Even in the last case, all is not lost. Sometimes, a symbol exists in a font, but there is no L<sup>A</sup>T<sub>E</sub>X binding for it. For example, the PostScript Symbol font contains a “␣” symbol, which may be useful for representing a carriage return, but there is no package (as far as I know) for accessing that symbol. To produce an unnamed symbol, you need to switch to the font explicitly with L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>'s low-level font commands [L<sup>A</sup>T<sub>E</sub>X 19] and use T<sub>E</sub>X's primitive `\char` command [Knu86a] to request a specific character number in the font. For example, one can define a command to typeset a long s (“f”) using character 115 from the Latin Modern fonts in the TS1 font encoding:<sup>1</sup>

```
\newcommand{\textlongs}{\%
  \fontencoding{TS1}\fontfamily{lmr}\selectfont\char115%
}
```

Then, `\textlongs ucce\textlongs sful` will produce “fuccefsful”—in the current font style (roman, italic, bold, etc.)

In fact, `\char` is not strictly necessary in all cases; the character can often be entered symbolically. For example, the symbol for an impulse train or Tate-Shafarevich group (“III”) is actually an uppercase *sha* in

<sup>1</sup>Since January 2020, the `wasysm` package provides a `\longs` symbol. See Table 48.

the Cyrillic alphabet. (Cyrillic is supported by the OT2 font encoding, for instance). While a *sha* can be defined numerically as “`\fontencoding{OT2}\selectfont\char88`” it may be more intuitive to use the OT2 font encoding’s “SH” ligature: “`\fontencoding{OT2}\selectfont SH`”. Another possibility is to use the T2A font encoding’s `\CYRSH` command: “`\fontencoding{T2A}\selectfont\CYRSH`”.

For the specific case of the U font encoding, which is used for symbol or “pi” fonts, the `pifont` package defines a convenient `\Pisymbol` command. `\Pisymbol` typesets a specified character (by number) in a specified font family. For example, “`\Pisymbol{psy}{191}`” produces the aforementioned “ $\perp$ ” symbol by typesetting character number 191 in the `psy` (PostScript Symbol) font family.

### 12.3.1 Reflecting and rotating existing symbols

A common request on `comp.text.tex` is for a reversed or rotated version of an existing symbol. As a last resort, these effects can be achieved with the `graphicx` (or `graphics`) package’s `\reflectbox` and `\rotatebox` macros. For example, `\textsuperscript{\reflectbox{?}}` produces an irony mark (“ $\textsuperscript{?}$ ”), and `\rotatebox[origin=c]{180}{\mathrel{\mathfrak{I}}}` produces the definite-description operator (“ $\mathfrak{I}$ ”). As noted by Marc Olschok in a July 2011 post on `comp.text.tex`, Project Gutenberg uses `\reflectbox` to typeset the part (“ $\mathfrak{3}$ ”) and whole (“ $\mathfrak{E}$ ”) relations used in Dedekind’s set notation:

```
\newcommand\partof{\mathrel{\raisebox{0.45ex}{\mathfrak{3}}}}
\newcommand\wholeof{\mathrel{\reflectbox{\partof}}}
```

The disadvantage of the `graphicx/graphics` approach is that not every  $\text{\TeX}$  backend handles graphical transformations.<sup>2</sup> Far better is to find a suitable font that contains the desired symbol in the correct orientation. For instance, if the `phonetic` package is available, then `\textit{\riota}` will yield a backend-independent “ $\mathfrak{r}$ ”. Similarly, `tipa`’s `\textrepsv` (“ $\mathfrak{3}$ ”) or `wsuipa`’s `\repsv` (“ $\mathfrak{3}$ ”) may be used to express the mathematical notion of “such that” in a cleaner manner than with `\reflectbox` or `\rotatebox`.<sup>3</sup>

### 12.3.2 Joining and overlapping existing symbols

Symbols that do not exist in any font can sometimes be fabricated out of existing symbols. The  $\text{\LaTeX}$  2 $\epsilon$  source file `fontdef.dtx` contains a number of such definitions. For example, `\models` (see Table 98 on page 67) is defined in that file with:

```
\def\models{\mathrel|\joinrel=}
```

where `\mathrel` and `\joinrel` are used to control the horizontal spacing. `\def` is the  $\text{\TeX}$  primitive upon which  $\text{\LaTeX}$ ’s `\newcommand` is based. See *The  $\text{\TeX}$ book* [Knu86a] for more information on all three of those commands.

With some simple pattern-matching, one can easily define a backward `\models` sign (“ $\models$ ”):

```
\def\ismodeledby{=\joinrel\mathrel|}
```

In general, arrows/harpoons, horizontal lines (“ $=$ ”, “ $-$ ”, “`\relbar`”, and “`\Relbar`”), and the various math-extension characters can be combined creatively with miscellaneous other characters to produce a variety of new symbols. Of course, new symbols can be composed from *any* set of existing characters. For instance,  $\text{\LaTeX}$  defines `\hbar` (“ $\hbar$ ”) as a “ $-$ ” character (`\mathchar'26`) followed by a backspace of 9 math units (`\mkern-9mu`), followed by the letter “ $h$ ”:

```
\def\hbar{\mathchar'26\mkern-9muh}
```

<sup>2</sup>As an example, Xdvi ignores both `\reflectbox` and `\rotatebox`.

<sup>3</sup>More common symbols for representing “such that” include “ $\models$ ”, “ $\models$ ”, and “`s.t.`”.

We can just as easily define other barred letters:

```
\def\bbar{\mathchar'26\mkern-9mu b}
\def\ubar{\mathchar'26\mkern-12mu d}
```

(The space after the “mu” is optional but is added for clarity.) `\bbar` and `\ubar` define “ $\bar{b}$ ” and “ $\bar{d}$ ”, respectively. Note that `\ubar` requires a greater backward math kern than `\bbar`; a  $-9\mu$  kern would have produced the less-attractive “ $\bar{d}$ ” glyph.

The `amsmath` package provides `\overset` and `\underset` commands for placing one symbol respectively above or below another. For example, `\overset{G}{\sim}`<sup>4</sup> produces “ $\overset{G}{\sim}$ ” (sometimes used for “equidecomposable with respect to  $G$ ”).

Sometimes an ordinary `tabular` environment can be co-opted into juxtaposing existing symbols into a new symbol. Consider the following definition of `\asterism` (“ $\ast$ ”) from a June 2007 post to `comp.text.tex` by Peter Flynn:

```
\newcommand{\asterism}{\smash{%
  \raisebox{-.5ex}{%
    \setlength{\tabcolsep}{-.5pt}%
    \begin{tabular}{@{}cc@{}}%
      \multicolumn{2}{\[-2ex] * & *}%
    \end{tabular}}}}
```

Note how the space between columns (`\tabcolsep`) and rows (`\[-2ex]`) is made negative to squeeze the asterisks closer together.

There is a `TeX` primitive called `\mathaccent` that centers one mathematical symbol atop another. For example, one can define `\dotcup` (“ $\dot{\cup}$ ”)—the composition of a `\cup` and a `\dot`—as follows:

```
\newcommand{\dotcup}{\ensuremath{\mathaccent\dot{\cup}}}
```

The catch is that `\mathaccent` requires the accent to be a “math character”. That is, it must be a character in a math font as opposed to a symbol defined in terms of other symbols. See *The TeXbook* [Knu86a] for more information.

Another `TeX` primitive that is useful for composing symbols is `\vcenter`. `\vcenter` is conceptually similar to “`\begin{tabular}{l}`” in `LATEX` but takes a list of vertical material instead of `\-`-separated rows. Also, it vertically centers the result on the math axis. (Many operators, such as “+” and “−” are also vertically centered on the math axis.) Enrico Gregorio posted the following symbol definition to `comp.text.tex` in March 2004 in response to a query about an alternate way to denote equivalence:

```
\newcommand*\threesim{%
  \mathrel{\vcenter{\offinterlineskip
    \hbox{\sim}\vskip-.35ex\hbox{\sim}\vskip-.35ex\hbox{\sim}}}}
```

The `\threesim` symbol, which vertically centers three `\sim` (“ $\sim$ ”) symbols with  $0.35x$ -heights of space between them, is rendered as “ $\approx$ ”. `\offinterlineskip` is a macro that disables implicit interline spacing. Without it, `\threesim` would have a full line of vertical spacing between each `\sim`. Because of `\vcenter`, `\threesim` aligns properly with other math operators:  $a \div b \approx c \times d$ .

A related `LATEX` command, borrowed from Plain `TeX`, is `\ooalign`. `\ooalign` vertically overlaps symbols and works both within and outside of math mode. Essentially, it creates a single-column `tabular` environment with zero vertical distance between rows. However, because it is based directly on `TeX`’s `\ialign`

<sup>4</sup>`LATEX`’s `\stackrel` command is similar but is limited to placing a symbol above a binary relation.

primitive, `\ooalign` uses T<sub>E</sub>X’s tabular syntax instead of L<sup>A</sup>T<sub>E</sub>X’s (i.e., with `\cr` as the row terminator instead of `\\`). The following example of `\ooalign`, a macro that defines a standard-state symbol (`\stst`, “ $\ominus$ ”) as a superscripted Plimsoll line (`\barcirc`, “ $\bar{\circ}$ ”),<sup>5</sup> is due to an October 2007 `comp.text.tex` post by Donald Arseneau:

```
\makeatletter
\providecommand\barcirc{\mathpalette\@barred\circ}
\def\@barred#1#2{\ooalign{\hfil$#1-$\hfil\cr\hfil$#1#2$\hfil\cr}}
\newcommand\stst{\protect\barcirc}
\makeatother
```

In the preceding code, note the `\ooalign` call’s use of `\hfil` to horizontally center a minus sign (“-”) and a `\circ` (“ $\circ$ ”).

As another example of `\ooalign`, consider the following code (due to Enrico Gregorio in a June 2007 post to `comp.text.tex`) that overlaps a `\ni` (“ $\ni$ ”) and two minus signs (“-”) to produce “ $\ni$ ”, an obscure variation on the infrequently used “ $\ni$ ” symbol for “such that” discussed on page 368:

```
\newcommand{\suchthat}{%
\mathrel{\ooalign{$\ni$\cr\kern-1pt$-$\kern-6.5pt$-$}}}
```

The `slashed` package, although originally designed for producing Feynman slashed-character notation, in fact facilitates the production of *arbitrary* overlapped symbols. The default behavior is to overwrite a given character with “/”. For example, `\slashed{D}` produces “ $\mathcal{D}$ ”. However, the `\declareslashed` command provides the flexibility to specify the mathematical context of the composite character (operator, relation, punctuation, etc., as will be discussed in Section 12.4), the overlapping symbol, horizontal and vertical adjustments in symbol-relative units, and the character to be overlapped. Consider, for example, the symbol for reduced quadrupole moment (“ $\mathcal{F}$ ”). This can be declared as follows:

```
\newcommand{\rqm}{%
\declareslashed}{\text{-}}{0.04}{0}{I}\slashed{I}}
```

`\declareslashed{.}{.}{.}{.}{I}` affects the meaning of all subsequent `\slashed{I}` commands in the same scope. The preceding definition of `\rqm` therefore uses an extra set of curly braces to limit that scope to a single `\slashed{I}`. In addition, `\rqm` uses `amstext`’s `\text` macro (described on page 372) to make `\declareslashed` use a text-mode hyphen (“-”) instead of a math-mode minus sign (“ $-$ ”) and to ensure that the hyphen scales properly in size in subscripts and superscripts. See `slashed`’s documentation (located in `slashed.sty` itself) for a detailed usage description of the `\slashed` and `\declareslashed` commands.

Somewhat simpler than `slashed` is the `centernot` package. `centernot` provides a single command, `\centernot`, which, like `\not`, puts a slash over the subsequent mathematical symbol. However, instead of putting the slash at a fixed location, `\centernot` centers the slash over its argument. `\centernot` might be used, for example, to create a “does not imply” symbol:

$$\not\Rightarrow \quad \backslash\not\Longrightarrow$$

vs.

$$\centernot\Rightarrow \quad \backslashcenternot\Longrightarrow$$

See the `centernot` documentation for more information.

<sup>5</sup>While `\barcirc` illustrates how to combine symbols using `\ooalign`, the `plimsoll` package’s `\plimsoll` command (Table 353 on page 165) and the `stmaryrd` package’s `\minuso` command (Table 55 on page 38) provide a similar glyph ( $\ominus$ ) as a single, indivisible symbol.

### 12.3.3 Making new symbols work in superscripts and subscripts

To make composite symbols work properly within subscripts and superscripts, you may need to use  $\TeX$ 's `\mathchoice` primitive. `\mathchoice` evaluates one of four expressions, based on whether the current math style is display, text, script, or scriptscript. (See The  $\TeX$ book [Knu86a] for a more complete description.) For example, the following  $\LaTeX$  code—posted to `comp.text.tex` by Torsten Bronger—composes a sub/superscriptable “ $\mathbb{I}$ ” symbol out of `\top` and `\bot` (“ $\top$ ” and “ $\perp$ ”):

```
\def\topbotatom#1{\hbox{\hbox to 0pt{#1\bot$\hss}$#1\top$}}
\newcommand*\topbot{\mathrel{\mathchoice{\topbotatom\displaystyle}
{\topbotatom\textstyle}
{\topbotatom\scriptstyle}
{\topbotatom\scriptscriptstyle}}}
```

The following is another example that uses `\mathchoice` to construct symbols in different math modes. The code defines a principal value integral symbol, which is an integral sign with a line through it.

```
\def\Xint#1{\mathchoice
{\XXint\displaystyle\textstyle{#1}}%
{\XXint\textstyle\scriptstyle{#1}}%
{\XXint\scriptstyle\scriptscriptstyle{#1}}%
{\XXint\scriptscriptstyle\scriptscriptstyle{#1}}%
!\int}
\def\XXint#1#2#3{\setbox0=\hbox{#1{#2#3}{\int}$}
\vcenter{\hbox{#2#3$}}\kern-.5\wd0}}
\def\ddashint{\Xint=}
\def\dashint{\Xint-}
```

(The preceding code was taken verbatim from <http://www.texfaq.org/FAQ-prinvalint.html>.) `\dashint` produces a single-dashed integral sign (“ $\int$ ”), while `\ddashint` produces a double-dashed one (“ $\int$ ”). The `\Xint` macro defined above can also be used to generate a wealth of new integrals: “ $\int$ ” (`\Xint\circlearrowright`), “ $\int$ ” (`\Xint\circlearrowleft`), “ $\int$ ” (`\Xint\subset`), “ $\int$ ” (`\Xint\infty`), and so forth.

$\LaTeX 2_{\epsilon}$  provides a simple wrapper for `\mathchoice` that sometimes helps produce terser symbol definitions. The macro is called `\mathpalette` and it takes two arguments. `\mathpalette` invokes the first argument, passing it one of “`\displaystyle`”, “`\textstyle`”, “`\scriptstyle`”, or “`\scriptscriptstyle`”, followed by the second argument. `\mathpalette` is useful when a symbol macro must know which math style is currently in use (e.g., to set it explicitly within an `\mbox`). Donald Arseneau posted the following `\mathpalette`-based definition of a probabilistic-independence symbol (“ $\perp$ ”) to `comp.text.tex` in June 2000:

```
\newcommand\independent{\protect\mathpalette{\protect\independentT}{\perp}}
\def\independentT#1#2{\mathrel{\rlap{#1#2$}\mkern2mu{#1#2}}}
```

The `\independent` macro uses `\mathpalette` to pass the `\independentT` helper macro both the current math style and the `\perp` symbol. `\independentT` typesets `\perp` in the current math style, moves two math units to the right, and finally typesets a second—overlapping—copy of `\perp`, again in the current math style. `\rlap`, which enables text overlap, is described on page 372.

Some people like their square-root signs with a trailing “hook” (i.e., “ $\sqrt{\quad}$ ”) as this helps visually distinguish expressions like “ $\sqrt{3x}$ ” from those like “ $\sqrt{3}x$ ”. In March 2002, Dan Luecking posted a `\mathpalette`-based definition of a hooked square-root symbol to `comp.text.tex`. This code was subsequently refined by Max Dohse and Scott Pakin into the version shown below, which accepts a root as an optional argument, for consistency with `\sqrt`.

```

\newcommand{\hksqrt}[2] [] {\mathpalette\DHLhksqrt{[#1]{#2\,}}}
\def\DHLhksqrt#1#2{\setbox0=\hbox{#1\sqrt#2}\dimen0=\ht0
\advance\dimen0-0.2\ht0
\setbox2=\hbox{\vrule height\ht0 depth-\dimen0}%
{\box0\lower0.4pt\box2}}

```

Notice how `\hksqrt` uses `\mathpalette` to pass the current math style (`\displaystyle`, `\textstyle`, etc.) to `\DHLhksqrt` as argument #1. `\DHLhksqrt` subsequently uses that style within an `\hbox`. The rest of the code is simply using TeX primitives to position a hook of height 0.2 times the `\sqrt` height at the right of the `\sqrt`. See The TeXbook [Knu86a] for more understanding of TeX “boxes” and “dimens”.

Sometimes, however, `amstext`’s `\text` macro is all that is necessary to make composite symbols appear correctly in subscripts and superscripts, as in the following definitions of `\neswarrow` (“↙”) and `\nwsearrow` (“↘”):<sup>6</sup>

```

\newcommand{\neswarrow}{\mathrel{\text{\nearrow}\llap{\swarrow}}}
\newcommand{\nwsearrow}{\mathrel{\text{\nwarrow}\llap{\searrow}}}

```

`\text` resembles L<sup>A</sup>T<sub>E</sub>X’s `\mbox` command but shrinks its argument appropriately when used within a subscript or superscript. `\llap` (“left overlap”) and its counterpart, `\rlap` (“right overlap”), appear frequently when creating composite characters. `\llap` outputs its argument to the left of the current position, overlapping whatever text is already there. Similarly, `\rlap` overlaps whatever text would normally appear to the right of its argument. For example, “`A\llap{B}`” and “`\rlap{A}B`” each produce “**B**”. However, the result of the former is the width of “A”, and the result of the latter is the width of “B”—`\llap{...}` and `\rlap{...}` take up zero space.

In a June 2002 post to `comp.text.tex`, Donald Arseneau presented a general macro for aligning an arbitrary number of symbols on their horizontal centers and vertical baselines:

```

\makeatletter
\def\moverlay{\mathpalette\mov@rlay}
\def\mov@rlay#1#2{\leavevmode\vtop{%
\baselineskip\z@skip \lineskiplimit-\maxdimen
\ialign{\hfil#1##$\hfil\cr#2\cr}}
\makeatother

```

The `\makeatletter` and `\makeatother` commands are needed to coerce L<sup>A</sup>T<sub>E</sub>X into accepting “@” as part of a macro name. `\moverlay` takes a list of symbols separated by `\cr` (TeX’s equivalent of L<sup>A</sup>T<sub>E</sub>X’s `\`). For example, the `\topbot` command defined above could have been expressed as “`\moverlay{\top\cr\bot}`” and the `\neswarrow` command defined above could have been expressed as “`\moverlay{\nearrow\cr\swarrow}`”.

The basic concept behind `\moverlay`’s implementation is that `\moverlay` typesets the given symbols in a table that utilizes a zero `\baselineskip`. This causes every row to be typeset at the same vertical position. See The TeXbook [Knu86a] for explanations of the TeX primitives used by `\moverlay`.

Steven B. Segletes answered a question on TeX Stack Exchange, “AMS inequalities: a variant of `\gtrsim` and `\lesssim`” on typesetting `\gtrsim` (“ $\gtrsim$ ”) and `\lesssim` (“ $\lesssim$ ”) with the `\sim` symbol slanted to match the angle of the greater-than/less-than sign. His solution incorporates the `graphicx` package’s `\rotatebox` for rotating the “~”, the `stackengine` package’s `\stackengine` command for stacking two symbols on top of each other, and the `scalrel` package’s `\ThisStyle`, `\SavedStyle`, and `\LMex` commands for scaling the symbol based on the surrounding context. The following code due to Segletes defines the `\gtrsimslant` (“ $\gtrsim$ ”) and `\lesssimslant` (“ $\lesssim$ ”) symbols:<sup>7</sup>

<sup>6</sup>Note that if your goal is to typeset commutative diagrams or pushout/pullback diagrams, then you should probably be using X<sub>Y</sub>-pic.

<sup>7</sup>The code as posted on TeX Stack Exchange named these `\vargtrsim` and `\varlesssim`. They are renamed here for naming consistency with symbols such as `\geqslant` (“ $\geqslant$ ”).

```

\newcommand\lesssimslant{\mathrel{\ensurestackMath{\ThisStyle{%
\stackengine{-0.4\LMex}{\SavedStyle<}{%
\rotatebox{-25}{\SavedStyle\sim$}}{U}{r}{F}{T}{S}}}}
\newcommand\gtrsimslant{\mathrel{\ensurestackMath{\ThisStyle{%
\stackengine{-0.4\LMex}{\SavedStyle>}{%
\rotatebox{25}{\SavedStyle\sim$}}{U}{l}{F}{T}{S}}}}

```

### 12.3.4 Modifying L<sup>A</sup>T<sub>E</sub>X-generated symbols

Oftentimes, symbols composed in the L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> source code can be modified with minimal effort to produce useful variations. For example, `fontdef.dtx` composes the `\ddots` symbol (see Table 306 on page 151) out of three periods, raised 7 pt., 4 pt., and 1 pt., respectively:

```

\def\ddots{\mathinner{\mkern1mu\raise7\p@
\ vbox{\kern7\p@\hbox{.}}\mkern2mu
\raise4\p@\hbox{.}\mkern2mu\raise\p@\hbox{.}\mkern1mu}}

```

`\p@` is a L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> shortcut for “pt” or “1.0pt”. The remaining commands are defined in The T<sub>E</sub>Xbook [Knu86a]. To draw a version of `\ddots` with the dots going along the opposite diagonal, we merely have to reorder the `\raise7\p@`, `\raise4\p@`, and `\raise\p@`:

```

\makeatletter
\def\revddots{\mathinner{\mkern1mu\raise\p@
\ vbox{\kern7\p@\hbox{.}}\mkern2mu
\raise4\p@\hbox{.}\mkern2mu\raise7\p@\hbox{.}\mkern1mu}}
\makeatother

```

`\revddots` is essentially identical to the `mathdots` package’s `\iddots` command or the `yhmath` package’s `\adots` command.

### 12.3.5 Encircling symbols

A simple, special case of combining existing symbols is to overlay a circle atop a given symbol. L<sup>A</sup>T<sub>E</sub>X’s built-in `\textcircled` (Table 19 on page 26) does exactly that: `\textcircled{A}` produces “ $\textcircled{A}$ ”. The `circledsteps` package enhances this capability by using T<sub>i</sub>kZ to draw circles—rather, ovals—that extend to fit their content, that can be colored, and that can align either the original symbol or the circled symbol on the baseline. As a simple example, `f\Circled{ghi}j` produces “ $f\textcircled{ghi}j$ ”, in contrast with `f\textcircled{ghi}j`, which produces “ $f\textcircled{ghij}$ ”.

### 12.3.6 Producing complex accents

Accents are another special case of combining existing symbols to make new symbols. While various tables in this document show how to add an accent to an existing symbol, some applications, such as transliterations from non-Latin alphabets, require *multiple* accents per character. For instance, the creator of pdfT<sub>E</sub>X writes his name as “Hàn Thê Thành”. The `dblaccnt` package enables L<sup>A</sup>T<sub>E</sub>X to stack accents, as in “ $\text{H}\text{‘}\text{an}\text{Th}\text{’}\text{‘}\text{e}\text{Th}\text{‘}\text{anh}$ ” (albeit not in the OT1 font encoding). In addition, the `wsuipa` package defines `\diatop` and `\diaunder` macros for putting one or more diacritics or accents above or below a given character. For example, `\diaunder[\diatop[\’|\=]]|\textsubdot{r}` produces “ $\text{r}^{\text{’}}$ ”. See the `wsuipa` documentation for more information.

The `accents` package facilitates the fabrication of accents in math mode. Its `\accentset` command enables *any* character to be used as an accent. For instance, `\accentset{\star}{f}` produces “ $f^{\star}$ ” and `\accentset{e}{X}` produces “ $X^e$ ”. `\underaccent` does the same thing, but places the accent beneath the

character. This enables constructs like `\underaccent{\tilde}{V}`, which produces “ $\tilde{V}$ ”. `accents` provides other accent-related features as well; see the documentation for more information.

### 12.3.7 Creating extensible symbols

A relatively simple example of creating extensible symbols stems from a `comp.text.tex` post by Donald Arseneau (June 2003). The following code defines an equals sign that extends as far to the right as possible, just like L<sup>A</sup>T<sub>E</sub>X’s `\hrulefill` command:

```
\makeatletter
\def\equalsfill{\m@th\mathord=\mkern-7mu
  \cleaders\hbox{\!\mathord=\!}\hfill
  \mkern-7mu\mathord=}
\makeatother
```

T<sub>E</sub>X’s `\cleaders` and `\hfill` primitives are the key to understanding `\equalsfill`’s extensibility. Essentially, `\equalsfill` repeats a box containing “=” plus some negative space until it fills the maximum available horizontal space. `\equalsfill` is intended to be used with L<sup>A</sup>T<sub>E</sub>X’s `\stackrel` command, which stacks one mathematical expression (slightly reduced in size) atop another. Hence, “`\stackrel{a}{\rightarrow}`” produces “ $\overset{a}{\rightarrow}$ ” and “`X \stackrel{\text{definition}}{\hbox{\equalsfill}} Y`” produces “ $X \overset{\text{definition}}{=} Y$ ”.

If all that needs to extend are horizontal and vertical lines—as opposed to repeated symbols such as the “=” in the previous example—L<sup>A</sup>T<sub>E</sub>X’s `array` or `tabular` environments may suffice. Consider the following code (due to a February 1999 `comp.text.tex` post by Donald Arseneau and subsequent modifications by Billy Yu and Scott Pakin) for typesetting annuity and life-insurance symbols:

```
\DeclareRobustCommand{\actuarial}[2][]{%
  \def\arraystretch{0}%
  \setlength\arraycolsep{0.5pt}%
  \setlength\arrayrulewidth{0.5pt}%
  \setbox0=\hbox{\scriptstyle#1#2}%
  \begin{array}[b]{*2{@}>\scriptstyle c|}
    \cline{2-2}%
    \rule[1.25pt]{0pt}{\ht0}%
    #1 & #2%
  \end{array}%
}
```

Using the preceding definition, one can type, e.g., “`$a_{\actuarial{n}}$`” to produce “ $a_{\overline{n}}$ ” and “`$a_{\actuarial[x:]{n}}$`” to produce “ $a_{x:\overline{n}}$ ”. This is similar in concept to how the `actuarialangle` package defines its `\actuarialangle` command (Table 287). For a more complete solution for typesetting actuarial symbols see the `actuarialsymbol` package.

A more complex example of composing accents is the following definition of extensible `\overbracket`, `\underbracket`, `\overparenthesis`, and `\underparenthesis` symbols, taken from a May 2002 `comp.text.tex` post by Donald Arseneau:

```
\makeatletter
\def\overbracket#1{\mathop{\vbox{\ialign{##\cr cr\noalign{\kern3\p@}
  \downbracketfill\cr cr\noalign{\kern3\p@\nointerlineskip}
  $\hfil\displaystyle{#1}\hfil$\cr cr}}}\limits}
\def\underbracket#1{\mathop{\vtop{\ialign{##\cr cr
  $\hfil\displaystyle{#1}\hfil$\cr cr\noalign{\kern3\p@\nointerlineskip}
  \upbracketfill\cr cr\noalign{\kern3\p@}}}\limits}
```



```

\def\overparenthesis#1{\mathop{\vbox{\ialign{##\crrc\noalign{\kern3\p@}
\downparenthfill\crrc\noalign{\kern3\p@\nointerlineskip}
$\hfil\displaystyle{#1}\hfil$\crrc}}\limits}
\def\overparenthesis#1{\mathop{\vtop{\ialign{##\crrc
$\hfil\displaystyle{#1}\hfil$\crrc\noalign{\kern3\p@\nointerlineskip}
\upparenthfill\crrc\noalign{\kern3\p@}}}\limits}
\def\downparenthfill{${\m@th\bracedl\leaders\vrule\hfill\bracerd$}
\def\upparenthfill{${\m@th\braceru\leaders\vrule\hfill\braceru$}
\def\upbracketfill{${\m@th\makesm@sh{\llap{\vrule\@height3\p@\@width.7\p@}}%
\leaders\vrule\@height.7\p@\hfill
\makesm@sh{\rlap{\vrule\@height3\p@\@width.7\p@}}$}
\def\downbracketfill{${\m@th
\makesm@sh{\llap{\vrule\@height.7\p@\@depth2.3\p@\@width.7\p@}}%
\leaders\vrule\@height.7\p@\hfill
\makesm@sh{\rlap{\vrule\@height.7\p@\@depth2.3\p@\@width.7\p@}}$}
\makeatother

```

Table 690 showcases these accents. The  $\TeX$ book [Knu86a] or another book on  $\TeX$  primitives is indispensable for understanding how the preceding code works. The basic idea is that `\downparenthfill`, `\upparenthfill`, `\downbracketfill`, and `\upbracketfill` do all of the work; they output a left symbol (e.g., `\bracedl` [“ $\l$ ”] for `\downparenthfill`), a horizontal rule that stretches as wide as possible, and a right symbol (e.g., `\bracerd` [“ $\r$ ”] for `\downparenthfill`). `\overbracket`, `\underbracket`, `\overparenthesis`, and `\underparenthesis` merely create a table whose width is determined by the given text, thereby constraining the width of the horizontal rules.

TABLE 690: Manually Composed Extensible Accents

$\overline{abc}$	<code>\overbracket{abc}</code>	$\widehat{abc}$	<code>\overparenthesis{abc}</code>
$\underline{abc}$	<code>\underbracket{abc}</code>	$\widetilde{abc}$	<code>\underparenthesis{abc}</code>

Note that the `simplewick` package provides mechanisms for typesetting Wick contractions, which utilize `\overbracket`- and `\underbracket`-like brackets of variable width *and* height (or depth). For example, “`\acontraction{}{A}{B}{C}\acontraction[2ex]{A}{B}{C}{D}\bcontraction{}{A}{BC}{D}ABCD`” produces



See the `simplewick` documentation for more information.

### 12.3.8 Developing new symbols from scratch

Sometimes it is simply not possible to define a new symbol in terms of existing symbols. Fortunately, most, if not all,  $\TeX$  distributions are shipped with a tool called METAFONT which is designed specifically for creating fonts to be used with  $\TeX$ . The METAFONTbook [Knu86b] is the authoritative text on METAFONT. If you plan to design your own symbols with METAFONT, The METAFONTbook is essential reading. You may also want to read the freely available METAFONT primer located at <http://metafont.tutorial.free.fr/>. The following is an extremely brief tutorial on how to create a new  $\LaTeX$  symbol using METAFONT. Its primary purpose is to cover the  $\LaTeX$ -specific operations not mentioned in The METAFONTbook and to demonstrate that symbol-font creation is not necessarily a difficult task.

Suppose we need a symbol to represent a light bulb (“ $\mathcal{Q}$ ”).<sup>8</sup> The first step is to draw this in METAFONT.

<sup>8</sup>I’m not a very good artist; you’ll have to pretend that “ $\mathcal{Q}$ ” looks like a light bulb.

It is common to separate the font into two files: a size-dependent file, which specifies the design size and various font-specific parameters that are a function of the design size; and a size-independent file, which draws characters in the given size. Figure 12.2 shows the METAFONT code for `lightbulb10.mf`. `lightbulb10.mf` specifies various parameters that produce a 10 pt. light bulb then loads `lightbulb.mf`. Ideally, one should produce `lightbulb<size>.mf` files for a variety of  $\langle size \rangle$ s. This is called “optical scaling”. It enables, for example, the lines that make up the light bulb to retain the same thickness at different font sizes, which looks much nicer than the alternative—and default—“mechanical scaling”. When a `lightbulb<size>.mf` file does not exist for a given size  $\langle size \rangle$ , the computer mechanically produces a wider, taller, thicker symbol:

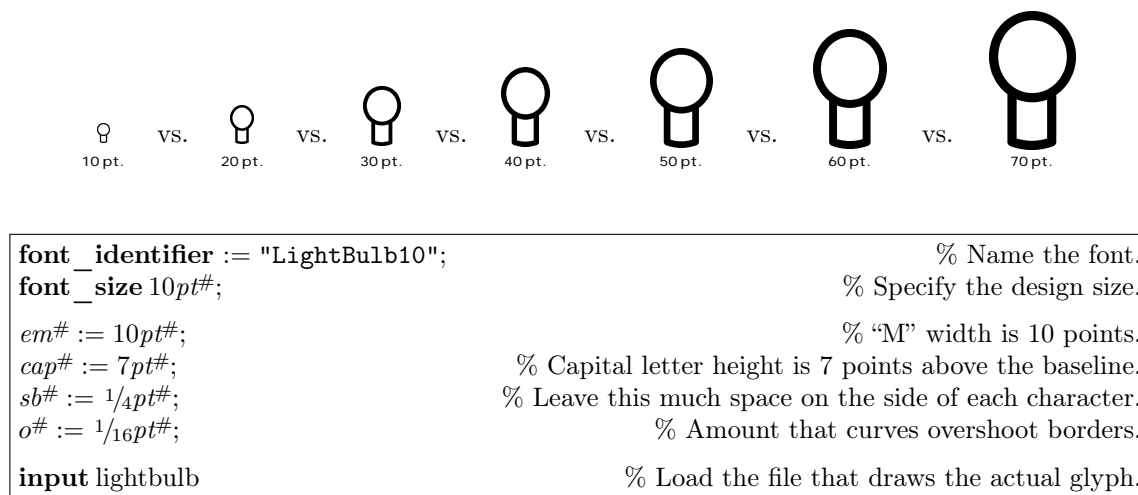


Figure 12.2: Sample METAFONT size-specific file (`lightbulb10.mf`)

`lightbulb.mf`, shown in Figure 12.3, draws a light bulb using the parameters defined in `lightbulb10.mf`. Note that the the filenames “`lightbulb10.mf`” and “`lightbulb.mf`” do not follow the Berry font-naming scheme [Ber01]; the Berry font-naming scheme is largely irrelevant for symbol fonts, which generally lack bold, italic, small-caps, slanted, and other such variants.

The code in Figures Figure 12.2 and Figure 12.3 is heavily commented and should demonstrate some of the basic concepts behind METAFONT usage: declaring variables, defining points, drawing lines and curves, and preparing to debug or fine-tune the output. Again, The METAFONTbook [Knu86b] is the definitive reference on METAFONT programming.

METAFONT can produce “proofs” of fonts—large, labeled versions that showcase the logical structure of each character. In fact, proof mode is METAFONT’s default mode. To produce a proof of `lightbulb10.mf`, issue the following commands at the operating-system prompt:

```

prompt> mf lightbulb10.mf                    ⇐ Produces lightbulb10.2602gf
prompt> gftodvi lightbulb10.2602gf          ⇐ Produces lightbulb10.dvi

```

You can then view `lightbulb10.dvi` with any DVI viewer. The result is shown in Figure 12.4. Observe how the grid defined with `makegrid` at the bottom of Figure 12.3 draws vertical lines at positions 0,  $sb$ ,  $w/2$ , and  $w - sb$  and horizontal lines at positions 0,  $-1pt$ ,  $y_2$ , and  $h$ . Similarly, observe how the `penlabels` command labels all of the important coordinates:  $z_1, z_2, \dots, z_8$  and  $z_{67}$ , which `lightbulb.mf` defines to lie between  $z_6$  and  $z_7$ .

Most, if not all, T<sub>E</sub>X distributions include a Plain T<sub>E</sub>X file called `testfont.tex` that is useful for testing new fonts in a variety of ways. One useful routine produces a table of all of the characters in the font:

```

prompt> tex testfont

```

```

mode_setup; % Target a given printer.
define_pixels(em, cap, sb); % Convert to device-specific units.
define_corrected_pixels(o); % Same, but add a device-specific fudge factor.

%% Define a light bulb at the character position for "A"
%% with width 1/2em#, height cap#, and depth 1pt#.
beginchar("A", 1/2em#, cap#, 1pt#); "A light bulb";
  pickup pencircle scaled 1/2pt; % Use a pen with a small, circular tip.

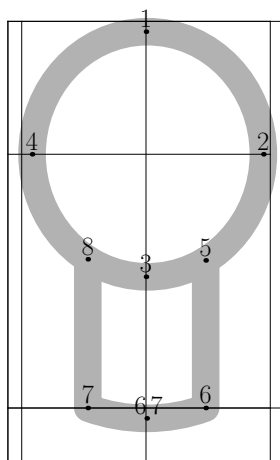
  %% Define the points we need.
  top z1 = (w/2, h + o); % z1 is at the top of a circle.
  rt z2 = (w + sb + o - x4, y4); % z2 is at the same height as z4 but the opposite side.
  bot z3 = (z1 - (0, w - sb - o)); % z3 is at the bottom of the circle.
  lft z4 = (sb - o, 1/2[y1, y3]); % z4 is on the left of the circle.
  path bulb; % Define a path for the bulb itself.
  bulb = z1 .. z2 .. z3 .. z4 .. cycle; % The bulb is a closed path.

  z5 = point 2 - 1/3 of bulb; % z5 lies on the bulb, a little to the right of z3.
  z6 = (x5, 0); % z6 is at the bottom, directly under z5.
  z7 = (x8, 0); % z7 is at the bottom, directly under z8.
  z8 = point 2 + 1/3 of bulb; % z8 lies on the bulb, a little to the left of z3.
  bot z67 = (1/2[x6, x7], pen_bot - o - 1/8pt); % z67 lies halfway between z6 and z7 but a jot
lower.

  %% Draw the bulb and the base.
  draw bulb; % Draw the bulb proper.
  draw z5 -- z6 .. z67 .. z7 -- z8; % Draw the base of the bulb.

  %% Display key positions and points to help us debug.
  makegrid(0, sb, w/2, w - sb)(0, -1pt, y2, h); % Label "interesting" x and y coordinates.
  penlabels(1, 2, 3, 4, 5, 6, 67, 7, 8); % Label control points for debugging.
endchar;
end

```

Figure 12.3: Sample METAFONT size-independent file (`lightbulb.mf`)Figure 12.4: Proof diagram of `lightbulb10.mf`

```

This is TeX, Version 3.14159 (Web2C 7.3.1)
(/usr/share/texmf/tex/plain/base/testfont.tex
Name of the font to test = lightbulb10
Now type a test command (\help for help):)
*\table

*\bye
[1]
Output written on testfont.dvi (1 page, 1516 bytes).
Transcript written on testfont.log.

```

The resulting table, stored in `testfont.dvi` and illustrated in Figure 12.5, shows every character in the font. To understand how to read the table, note that the character code for “A”—the only character defined by `lightbulb10.mf`—is 41 in hexadecimal (base 16) and 101 in octal (base 8).

	'0	'1	'2	'3	'4	'5	'6	'7	
'10x		9							~4x
'11x									
	~8	~9	~A	~B	~C	~D	~E	~F	

Figure 12.5: Font table produced by `testfont.tex`

The LightBulb10 font is now usable by  $\text{T}_{\text{E}}\text{X}$ .  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$ , however, needs more information before documents can use the font. First, we create a font-description file that tells  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  how to map fonts in a given font family and encoding to a particular font in a particular font size. For symbol fonts, this mapping is fairly simple. Symbol fonts almost always use the “U” (“Unknown”) font encoding and frequently occur in only one variant: normal weight and non-italicized. The filename for a font-description file is important; it must be of the form “ $\langle encoding \rangle \langle family \rangle .fd$ ”, where  $\langle encoding \rangle$  is the lowercase version of the encoding name (typically “u” for symbol fonts) and  $\langle family \rangle$  is the name of the font family. For LightBulb10, let’s call this “bulb”. Figure 12.6 lists the contents of `ubulb.fd`. The document “ $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  Font Selection” [LAT19] describes `\DeclareFontFamily` and `\DeclareFontShape` in detail, but the gist of `ubulb.fd` is first to declare a U-encoded version of the `bulb` font family and then to specify that a  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  request for a U-encoded version of `bulb` with a (m)edium font series (as opposed to, e.g., bold) and a (n)ormal font shape (as opposed to, e.g., italic) should translate into a  $\text{T}_{\text{E}}\text{X}$  request for `lightbulb10.tfm` mechanically scaled to the current font size.

```

\DeclareFontFamily{U}{bulb}{}
\DeclareFontShape{U}{bulb}{m}{n}{<-> lightbulb10}{}

```

Figure 12.6:  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  font-description file (`ubulb.fd`)

The final step is to write a  $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X } 2_{\epsilon}$  style file that defines a name for each symbol in the font. Because we have only one symbol our style file, `lightbulb.sty` (Figure 12.7), is rather trivial. Note that instead of typesetting “A” we could have had `\lightbulb typeset “\char65”`, “`\char41`”, or “`\char101`” (respectively, decimal, hexadecimal, and octal character offsets into the font). For a simple, one-character symbol font such as LightBulb10 it would be reasonable to merge `ubulb.fd` into `lightbulb.sty` instead of maintaining

two separate files. In either case, a document need only include “`\usepackage{lightbulb}`” to make the `\lightbulb` symbol available.

```
\newcommand{\lightbulb}{\usefont{U}{bulb}{m}{n}A}
```

Figure 12.7: L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> style file (`lightbulb.sty`)

METAFONT normally produces bitmapped fonts. However, it is also possible, with the help of some external tools, to produce PostScript Type 1 fonts. These have the advantages of rendering better in Adobe<sup>®</sup> Acrobat<sup>®</sup> (at least in versions prior to 6.0) and of being more memory-efficient when handled by a PostScript interpreter. See <http://www.texfaq.org/FAQ-textrace.html> for pointers to tools that can produce Type 1 fonts from METAFONT.

## 12.4 Math-mode spacing

Terms such as “binary operators”, “relations”, and “punctuation” in Chapter 3 primarily regard the surrounding spacing. (See the Short Math Guide for L<sup>A</sup>T<sub>E</sub>X [Dow00] for a nice exposition on the subject.) To use a symbol for a different purpose, you can use the T<sub>E</sub>X commands `\mathord`, `\mathop`, `\mathbin`, `\mathrel`, `\mathopen`, `\mathclose`, and `\mathpunct`. For example, if you want to use `\downarrow` as a variable (an “ordinary” symbol) instead of a delimiter, you can write “`$3x + \mathord{\downarrow}$`” to get the properly spaced “ $3x + \downarrow$ ” rather than the awkward-looking “ $3x + \downarrow$ ”. Similarly, to create a dotted-union symbol (“ $\dot{\cup}$ ”) that spaces like the ordinary set-union symbol (`\cup`) it must be defined with `\mathbin`, just as `\cup` is. Contrast “`$A \dot{\cup} B$`” (“ $A \dot{\cup} B$ ”) with “`$A \mathbin{\dot{\cup}} B$`” (“ $A \dot{\cup} B$ ”). See The T<sub>E</sub>Xbook [Knu86a] for the definitive description of math-mode spacing.

The purpose of the “log-like symbols” in Table 203 and Table 204 is to provide the correct amount of spacing around and within multiletter function names. Table 691 on page 379 contrasts the output of the log-like symbols with various, naïve alternatives. In addition to spacing, the log-like symbols also handle subscripts properly. For example, “`\max_{p \in P}`” produces “ $\max_{p \in P}$ ” in text, but “ $\max$ ” as part of a displayed formula.

TABLE 691: Spacing Around/Within Log-like Symbols

L <sup>A</sup> T <sub>E</sub> X expression	Output
<code>\$r \sin \theta\$</code>	$r \sin \theta$ (best)
<code>\$r \sin \theta\$</code>	$rsin\theta$
<code>\$r \mbox{\sin} \theta\$</code>	$rsin\theta$
<code>\$r \mathrm{\sin} \theta\$</code>	$rsin\theta$

The `amsmath` package makes it straightforward to define new log-like symbols:

```
\DeclareMathOperator{\atan}{atan}
\DeclareMathOperator*{\lcm}{lcm}
```

The difference between `\DeclareMathOperator` and `\DeclareMathOperator*` involves the handling of subscripts. With `\DeclareMathOperator*`, subscripts are written beneath log-like symbols in display style and to the right in text style. This is useful for limit operators (e.g., `\lim`) and functions that tend to map over a set (e.g., `\min`). In contrast, `\DeclareMathOperator` tells T<sub>E</sub>X that subscripts should always be displayed to the right of the operator, as is common for functions that take a single parameter (e.g., `\log` and `\cos`).

Table 692 contrasts symbols declared with `\DeclareMathOperator` and `\DeclareMathOperator*` in both text style (`$. . .$`) and display style (`\[. . .\]`).<sup>9</sup>

TABLE 692: Defining new log-like symbols

Declaration function	<code>\$\$\newlogsym_{p \in P}\$\$</code>	<code>\[ \newlogsym_{p \in P} \]</code>
<code>\DeclareMathOperator</code>	<code>newlogsym<sub>p∈P</sub></code>	<code>newlogsym<sub>p∈P</sub></code>
<code>\DeclareMathOperator*</code>	<code>newlogsym<sub>p∈P</sub></code>	<code>newlogsym<sub>p∈P</sub></code>

It is common to use a thin space (`\,`) between the words of a multiword operators, as in `"\DeclareMathOperator*{\argmax}{arg\,max}"`. `\liminf`, `\limsup`, and all of the log-like symbols shown in Table 204 utilize this spacing convention.

## 12.5 Bold mathematical symbols

L<sup>A</sup>T<sub>E</sub>X does not normally use bold symbols when typesetting mathematics. However, bold symbols are occasionally needed, for example when naming vectors. Any of the approaches described at <http://www.texfaq.org/FAQ-boldgreek.html> can be used to produce bold mathematical symbols. Table 693 contrasts the output produced by these various techniques. As the table illustrates, these techniques exhibit variation in their formatting of Latin letters (upright vs. italic), formatting of Greek letters (bold vs. normal), formatting of operators and relations (bold vs. normal), and spacing. `xfakebold`'s `\setBold` command is unique in that it takes a thickness argument and supports arbitrary symbol thickness, although it works only with vector fonts, not bitmapped fonts.

TABLE 693: Producing bold mathematical symbols

Package	Code	Output	
<i>none</i>	<code>\$\$\alpha + b = \Gamma \div D\$\$</code>	$\alpha + b = \Gamma \div D$	(no bold)
<i>none</i>	<code>\$\$\mathbf{\alpha + b = \Gamma \div D}\$\$</code>	$\alpha + b = \Gamma \div D$	
<i>none</i>	<code>\boldmath\$\alpha + b = \Gamma \div D\$</code>	$\alpha + b = \Gamma \div D$	
<code>amsbsy</code>	<code>\$\$\pmb{\alpha + b = \Gamma \div D}\$\$</code>	$\alpha + b = \Gamma \div D$	(faked bold)
<code>amsbsy</code>	<code>\$\$\boldsymbol{\alpha + b = \Gamma \div D}\$\$</code>	$\alpha + b = \Gamma \div D$	
<code>bm</code>	<code>\$\$\bm{\alpha + b = \Gamma \div D}\$\$</code>	$\alpha + b = \Gamma \div D$	
<code>fixmath</code>	<code>\$\$\mathbold{\alpha + b = \Gamma \div D}\$\$</code>	$\alpha + b = \Gamma \div D$	
<code>xfakebold</code>	<code>\setBold[0.3]</code> <code>\$\$\alpha + b = \Gamma \div D\$</code> <code>\unsetBold</code>	$\alpha + b = \Gamma \div D$	(faked bold)

## 12.6 ASCII and Latin 1 quick reference

Table 694 on page 381 amalgamates data from various other tables in this document into a convenient reference for L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> typesetting of ASCII characters, i.e., the characters available on a typical U.S. computer

<sup>9</sup>Note that `\displaystyle` can be used to force display style within `$. . .$` and `\textstyle` can be used to force text style within `\[. . .\]`.

keyboard. The first two columns list the character’s ASCII code in decimal and hexadecimal. The third column shows what the character looks like. The fourth column lists the  $\text{\LaTeX} 2_{\epsilon}$  command to typeset the character as a text character. And the fourth column lists the  $\text{\LaTeX} 2_{\epsilon}$  command to typeset the character within a  $\text{\textttt}\{...\}$  command (or, more generally, when  $\text{\ttfamily}$  is in effect).

TABLE 694:  $\text{\LaTeX} 2_{\epsilon}$  ASCII Table

Dec	Hex	Char	Body text	$\text{\textttt}$	Dec	Hex	Char	Body text	$\text{\textttt}$
33	21	!	!	!	62	3E	>	$\text{\textgreater}$	>
34	22	"	$\text{\textquotedbl}$	"	63	3F	?	?	?
35	23	#	$\text{\text\#}$	$\text{\text\#}$	64	40	@	@	@
36	24	\$	$\text{\text\$}$	$\text{\text\$}$	65	41	A	A	A
37	25	%	$\text{\text\%}$	$\text{\text\%}$	66	42	B	B	B
38	26	&	$\text{\text\&}$	$\text{\text\&}$	67	43	C	C	C
39	27	'	'	'	:	:	:	:	:
40	28	(	(	(	90	5A	Z	Z	Z
41	29	)	)	)	91	5B	[	[	[
42	2A	*	*	*	92	5C	\	$\text{\textbackslash}$	$\text{\char'\textbackslash}$
43	2B	+	+	+	93	5D	]	]	]
44	2C	,	,	,	94	5E	^	$\text{\textasciicircum}$	$\text{\textasciicircum}$
45	2D	-	-	-	95	5F	_	$\text{\textunderscore}$	$\text{\char'\textunderscore}$
46	2E	.	.	.	96	60	'	'	'
47	2F	/	/	/	97	61	a	a	a
48	30	0	0	0	98	62	b	b	b
49	31	1	1	1	99	63	c	c	c
50	32	2	2	2	:	:	:	:	:
:	:	:	:	:	122	7A	z	z	z
57	39	9	9	9	123	7B	{	$\text{\text\{}$	$\text{\char'\text\{}$
58	3A	:	:	:	124	7C		$\text{\textbar}$	
59	3B	;	;	;	125	7D	}	$\text{\text\}}$	$\text{\char'\text\}}$
60	3C	<	$\text{\textless}$	<	126	7E	~	$\text{\textasciitilde}$	$\text{\textasciitilde}$
61	3D	=	=	=					

The following are some additional notes about the contents of Table 694:

- “” is not available in the OT1 font encoding.
- Table 694 shows a close quote for character 39 for consistency with the open quote shown for character 96. A straight quote can be typeset using  $\text{\textquotesingle}$  (cf. Table 47).
- The characters “<”, “>”, and “|” do work as expected in math mode, although they produce, respectively, “|”, “;”, and “—” in text mode when using the OT1 font encoding.<sup>10</sup> The following are some alternatives for typesetting “<”, “>”, and “|”:
  - Specify a document font encoding other than OT1 (as described on page 16).
  - Use the appropriate symbol commands from Table 2 on page 19, viz.  $\text{\textless}$ ,  $\text{\textgreater}$ , and  $\text{\textbar}$ .

<sup>10</sup>Donald Knuth didn’t think such symbols were important outside of mathematics so he omitted them from his text fonts.

- Enter the symbols in math mode instead of text mode, i.e.,  $\$<\$, \$>\$,$  and  $\$|\$$ .

Note that for typesetting metavariables many people prefer `\texttriangle` and `\textrightangle` to `\textless` and `\textgreater`; i.e., “`\langle filename \rangle`” instead of “`<filename>`”.

- Although “/” does not require any special treatment,  $\text{\LaTeX}$  additionally defines a `\slash` command which outputs the same glyph but permits a line break afterwards. That is, “`increase/decrease`” is always typeset as a single entity while “`increase\slash{}decrease`” may be typeset with “`increase/`” on one line and “`decrease`” on the next.
- `\textasciicircum` can be used instead of `\^{}`, and `\textasciitilde` can be used instead of `\~{}`. Note that `\textasciitilde` and `\~{}` produce raised, diacritic tildes. “Text” (i.e., vertically centered) tildes can be generated with either the math-mode `\sim` command (shown in Table 98 on page 67), which produces a somewhat wide “`~`”, or the `textcomp` package’s `\texttildelow` (shown in Table 47 on page 34), which produces a vertically centered “`~`” in most fonts but a baseline-oriented “`~`” in Computer Modern, `txfonts`, `pxfonts`, and various other fonts originating from the  $\text{\TeX}$  world. If your goal is to typeset tildes in URLs or Unix filenames, your best bet is to use the `url` package, which has a number of nice features such as proper line-breaking of such names.
- The various `\char` commands within `\textttt` are necessary only in the OT1 font encoding. In other encodings (e.g., T1), commands such as `\{`, `\}`, `\_`, and `\textbackslash` all work properly.
- The code page 437 (IBM PC) version of ASCII characters 1 to 31 can be typeset using the `ascii` package. See Table 368 on page 170.
- To replace “`“`” and “`”`” with the more computer-like (and more visibly distinct) “`”`” and “`‘`” within a `verbatim` environment, use the `upquote` package. Outside of `verbatim`, you can use `\char18` and `\char13` to get the modified quote characters. (The former is actually a grave accent.)

Similar to Table 694, Table 695 on the following page is an amalgamation of data from other tables in this document. While Table 694 shows how to typeset the 7-bit ASCII character set, Table 695 shows the Latin 1 (Western European) character set, also known as ISO-8859-1.

The following are some additional notes about the contents of Table 695:

- A “(tc)” after a symbol name means that the `textcomp` package must be loaded to access that symbol. A “(T1)” means that the symbol requires the T1 font encoding. The `fontenc` package can change the font encoding document-wide.
- Many of the `\text...` accents can also be produced using the accent commands shown in Table 19 on page 26 plus an empty argument. For instance, `\={}` is essentially the same as `\textasciimacron`.
- The commands in the “ $\text{\LaTeX} 2_{\epsilon}$ ” columns work both in body text and within a `\textttt{...}` command (or, more generally, when `\ttfamily` is in effect).
- The “ $\text{\LaTeX}$ ” and “ $\text{\$}$ ” glyphs occupy the same slot (36) of the OT1 font encoding, with “ $\text{\LaTeX}$ ” appearing in italic fonts and “ $\text{\$}$ ” appearing in roman fonts. A problem with  $\text{\LaTeX}$ ’s default handling of this double-mapping is that “`\sffamily\slshape\pounds`” produces “ $\text{\$}$ ”, not “ $\text{\LaTeX}$ ”. Other font encodings use separate slots for the two characters and are therefore robust to the problem of “ $\text{\LaTeX}$ ”/“ $\text{\$}$ ” conflicts. Authors who use `\pounds` should select a font encoding other than OT1 (as explained on page 16) or use the `textcomp` package, which redefines `\pounds` to use the TS1 font encoding.
- Character 173, `\-`, is shown as “`-`” but is actually a discretionary hyphen; it appears only at the end of a line.



TABLE 695: L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Latin 1 Table

Dec	Hex	Char	L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub>	Dec	Hex	Char	L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub>
161	A1	¡	!'	209	D1	Ñ	\~{N}
162	A2	¢	\textcent (tc)	210	D2	Ò	\' {O}
163	A3	£	\pounds	211	D3	Ó	\' {O}
164	A4	¤	\textcurrency (tc)	212	D4	Ô	\~ {O}
165	A5	¥	\textyen (tc)	213	D5	Õ	\~ {O}
166	A6	¦	\textbrokenbar (tc)	214	D6	Ö	\" {O}
167	A7	§	\S	215	D7	×	\texttimes (tc)
168	A8	¨	\textasciidieresis (tc)	216	D8	Ø	\O
169	A9	©	\textcopyright	217	D9	Ù	\' {U}
170	AA	ª	\textordfeminine	218	DA	Ú	\' {U}
171	AB	«	\guillemetleft (T1)	219	DB	Û	\~ {U}
172	AC	¬	\textlnot (tc)	220	DC	Ü	\" {U}
173	AD	-	\-	221	DD	Ý	\' {Y}
174	AE	®	\textregistered	222	DE	Þ	\TH (T1)
175	AF	ˆ	\textasciimacron (tc)	223	DF	ß	\ss
176	B0	°	\textdegree (tc)	224	E0	à	\' {a}
177	B1	±	\textpm (tc)	225	E1	á	\' {a}
178	B2	²	\texttwosuperior (tc)	226	E2	â	\~ {a}
179	B3	³	\textthreesuperior (tc)	227	E3	ã	\~ {a}
180	B4	´	\textasciiacute (tc)	228	E4	ä	\" {a}
181	B5	µ	\textmu (tc)	229	E5	å	\aa
182	B6	¶	\P	230	E6	æ	\ae
183	B7	·	\textperiodcentered	231	E7	ç	\c {c}
184	B8	¸	\c {}	232	E8	è	\' {e}
185	B9	¹	\textonesuperior (tc)	233	E9	é	\' {e}
186	BA	º	\textordmasculine	234	EA	ê	\~ {e}
187	BB	»	\guillemetright (T1)	235	EB	ë	\" {e}
188	BC	¼	\textonequarter (tc)	236	EC	ì	\' {i}
189	BD	½	\textonehalf (tc)	237	ED	í	\' {i}
190	BE	¾	\textthreequarters (tc)	238	EE	î	\~ {i}
191	BF	¿	?'	239	EF	ï	\" {i}
192	C0	À	\' {A}	240	F0	ð	\dh (T1)
193	C1	Á	\' {A}	241	F1	ñ	\~ {n}
194	C2	Â	\~ {A}	242	F2	ò	\' {o}
195	C3	Ã	\~ {A}	243	F3	ó	\' {o}
196	C4	Ä	\" {A}	244	F4	ô	\~ {o}
197	C5	Å	\AA	245	F5	õ	\~ {o}
198	C6	Æ	\AE	246	F6	ö	\" {o}
199	C7	Ç	\c {C}	247	F7	÷	\textdiv (tc)
200	C8	È	\' {E}	248	F8	ø	\o
201	C9	É	\' {E}	249	F9	ù	\' {u}
202	CA	Ê	\~ {E}	250	FA	ú	\' {u}
203	CB	Ë	\" {E}	251	FB	û	\~ {u}
204	CC	Ì	\' {I}	252	FC	ü	\" {u}
205	CD	Í	\' {I}	253	FD	ý	\' {y}
206	CE	Î	\~ {I}	254	FE	þ	\th (T1)
207	CF	Ï	\" {I}	255	FF	ÿ	\" {y}
208	D0	Ð	\DH (T1)				

TABLE 696: L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Code Page 1252 Table

Dec	Hex	Char	L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub>		Dec	Hex	Char	L <sup>A</sup> T <sub>E</sub> X 2 <sub>ε</sub>
128	80	€	<code>\texteuro</code>	(tc)	145	91	‘	‘
130	82	,	<code>\quotesinglbase</code>	(T1)	146	92	,	,
131	83	f	<code>\textit{f}</code>		147	93	“	“
132	84	„	<code>\quotedblbase</code>	(T1)	148	94	”	”
133	85	...	<code>\dots</code>		149	95	•	<code>\textbullet</code>
134	86	†	<code>\dag</code>		150	96	–	–
135	87	‡	<code>\ddag</code>		151	97	—	--
136	88	^	<code>\~{}</code>		152	98	~	<code>\~{}</code>
137	89	‰	<code>\textperthousand</code>	(tc)	153	99	™	<code>\texttrademark</code>
138	8A	Š	<code>\v{S}</code>		154	9A	š	<code>\v{s}</code>
139	8B	<	<code>\guilsinglleft</code>	(T1)	155	9B	>	<code>\guilsinglright</code> (T1)
140	8C	Œ	<code>\OE</code>		156	9C	œ	<code>\oe</code>
142	8E	Ž	<code>\v{Z}</code>		158	9E	ž	<code>\v{z}</code>
					159	9F	ÿ	<code>\"Y</code>

Microsoft<sup>®</sup> Windows<sup>®</sup> normally uses a superset of Latin 1 called “Code Page 1252” or “CP1252” for short. CP1252 introduces symbols in the Latin 1 “invalid” range (characters 128–159). Table 696 presents the characters with which CP1252 augments the standard Latin 1 table.

The following are some additional notes about the contents of Table 696:

- As in Table 695, a “(tc)” after a symbol name means that the `textcomp` package must be loaded to access that symbol. A “(T1)” means that the symbol requires the T1 font encoding. The `fontenc` package can change the font encoding document-wide.
- Not all characters in the 128–159 range are defined.
- Look up “euro signs” in the index for alternatives to `\texteuro`.

While too large to incorporate into this document, a listing of ISO 8879:1986 SGML/XML character entities and their L<sup>A</sup>T<sub>E</sub>X equivalents is available from <http://www.bitjungle.com/isoent/>. Some of the characters presented there make use of `isoent`, a L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> package (available from the same URL) that fakes some of the missing ISO glyphs using the L<sup>A</sup>T<sub>E</sub>X `picture` environment.<sup>11</sup>

## 12.7 Unicode characters

Unicode is a “universal character set”—a standard for encoding (i.e., assigning unique numbers to) the symbols appearing in many of the world’s languages. While ASCII can represent 128 symbols and Latin 1 can represent 256 symbols, Unicode can represent an astonishing 1,114,112 symbols.

Because T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X predate the Unicode standard and Unicode fonts by almost a decade, support for Unicode has had to be added to the base T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X systems. Note first that L<sup>A</sup>T<sub>E</sub>X distinguishes between *input* encoding—the characters used in the `.tex` file—and *output* encoding—the characters that appear in the generated `.dvi`, `.pdf`, etc. file.

<sup>11</sup>`isoent` is not featured in this document, because it is not available from CTAN and because the faked symbols are not “true” characters; they exist in only one size, regardless of the body text’s font size.

### 12.7.1 Inputting Unicode characters

To include Unicode characters in a `.tex` file, load the `ucs` package and load the `inputenc` package with the `utf8x` (“UTF-8 extended”) option.<sup>12</sup> These packages enable  $\LaTeX$  to translate UTF-8 sequences to  $\LaTeX$  commands, which are subsequently processed as normal. For example, the UTF-8 text “Copyright © 2024”—“©” is not an ASCII character and therefore cannot be input directly without packages such as `ucs/inputenc`—is converted internally by `inputenc` to “Copyright `\textcopyright` 2024” and therefore typeset as “Copyright © 2024”.

The `ucs/inputenc` combination supports only a tiny subset of Unicode’s million-plus symbols. Additional symbols can be added manually using the `\DeclareUnicodeCharacter` command. `\DeclareUnicodeCharacter` takes two arguments: a Unicode number and a  $\LaTeX$  command to execute when the corresponding Unicode character is encountered in the input. For example, the Unicode character “degree celsius” (“°C”) appears at character position U+2103.<sup>13</sup> However, “°C” is not one of the characters that `ucs` and `inputenc` recognize. The following document shows how to use `\DeclareUnicodeCharacter` to tell  $\LaTeX$  that the “°C” character should be treated as a synonym for `\textcelsius`:

```
\documentclass{article}
\usepackage{ucs}
\usepackage[utf8x]{inputenc}
\usepackage{textcomp}

\DeclareUnicodeCharacter{"2103}{\textcelsius} % Enable direct input of U+2103.

\begin{document}
It was a balmy 21°C.
\end{document}
```

which produces

It was a balmy 21°C.

See the `ucs` documentation for more information and for descriptions of the various options that control `ucs`’s behavior.

### 12.7.2 Outputting Unicode characters

Orthogonal to the ability to include Unicode characters in a  $\LaTeX$  input file is the ability to include a given Unicode character in the corresponding output file. By far the easiest approach is to use `Lua $\LaTeX$`  or `X $\LaTeX$`  instead of `pdf $\LaTeX$`  or ordinary  $\LaTeX$ . `Lua $\LaTeX$`  and `X $\LaTeX$`  handle Unicode input and output natively and can utilize system fonts directly without having to expose them via `.tfm`, `.fd`, and other such files. To output a Unicode character, a `Lua $\LaTeX$`  or `X $\LaTeX$`  document can either include that character directly as UTF-8 text or use  $\TeX$ ’s `\char` primitive, which `Lua $\LaTeX$` /`X $\LaTeX$`  extends to accept numbers larger than 255.

Suppose we want to output the symbols for versicle (“∞”) and response (“⌘”) in a document. The Unicode charts list “versicle” at position U+2123 and “response” at position U+211F. We therefore need to install a font that contains those characters at their proper positions. One such font that is freely available from CTAN is `Junicode` (`Junicode.ttf`) from the `junicode` package. The `fontspec` package makes it easy for a `Lua $\LaTeX$` /`X $\LaTeX$`  document to utilize a system font. The following example defines a `\textjuni` command that uses `fontspec` to typeset its argument in `Junicode`:

<sup>12</sup>UTF-8 is the 8-bit Unicode Transformation Format, a popular mechanism for representing Unicode symbol numbers as sequences of one to four bytes.

<sup>13</sup>The Unicode convention is to express character positions as “U+{hexadecimal number}”.

```

\documentclass{article}
\usepackage{fontspec}

\newcommand{\textjuni}[1]{\fontspec{Junicode}#1}

\begin{document}
We use ‘‘\textjuni{\char"2123}’’ for a versicle
and ‘‘\textjuni{\char"211F}’’ for a response.
\end{document}

```

which produces

We use “ $\gamma$ ” for a versicle and “ $\kappa$ ” for a response.

(Typesetting the entire document in Junicode would be even easier. See the `fontspec` documentation for more information regarding font selection.) Note how the preceding example uses `\char` to specify a Unicode character by number. The double quotes before the number indicate that the number is represented in hexadecimal instead of decimal.

## 12.8 About this document

**History** David Carlisle wrote the first version of this document in October, 1994. It originally contained all of the native  $\LaTeX$  symbols (Table 53, Table 79, Table 98, Table 153, Table 203, Table 208, Table 244, Table 245, Table 259, Table 270, Table 334, and a few tables that have since been reorganized) and was designed to be nearly identical to the tables in Chapter 3 of Leslie Lamport’s book [Lam86]. Even the table captions and the order of the symbols within each table matched! The  $\mathcal{AMS}$  symbols (Table 54, Table 99, Table 100, Table 156, Table 157, Table 209, Table 218, Table 238, and Table 335) and an initial Math Alphabets table (Table 348) were added thereafter. Later, Alexander Holt provided the `stmaryrd` tables (Table 55, Table 81, Table 101, Table 159, Table 199, and Table 239).

In January, 2001, Scott Pakin took responsibility for maintaining the symbol list and has since implemented a complete overhaul of the document. The result, now called, “The Comprehensive  $\LaTeX$  Symbol List”, includes the following new features:

- the addition of a handful of new math alphabets, dozens of new font tables, and thousands of new symbols
- the categorization of the symbol tables into body-text symbols, mathematical symbols, science and technology symbols, dingbats, ancient languages, and other symbols, to provide a more user-friendly document structure
- an index, table of contents, hyperlinks, and a frequently-requested symbol list, to help users quickly locate symbols
- symbol tables rewritten to list the symbols in alphabetical order
- appendices providing additional information relevant to using symbols in  $\LaTeX$
- tables showing how to typeset all of the characters in the ASCII and Latin 1 font encodings

Furthermore, the internal structure of the document has been completely altered from David Carlisle’s original version. Most of the changes are geared towards making the document easier to extend, modify, and reformat.

**Build characteristics** Table 697 on page 387 lists some of this document’s build characteristics. Most important is the list of packages that L<sup>A</sup>T<sub>E</sub>X couldn’t find, but that `symbols.tex` otherwise would have been able to take advantage of. Complete, prebuilt versions of this document are available from CTAN via <https://www.ctan.org/pkg/comprehensive/>. Table 698 shows the package date (specified in the `.sty` file with `\ProvidesPackage`) for each package that was used to build this document and that specifies a package date. Packages are not listed in any particular order in either Table 697 or Table 698.

TABLE 697: Document Characteristics

Characteristic	Value
Source file:	<code>symbols.tex</code>
Build date:	January 3, 2024
Symbols documented:	20323
Packages included:	<code>textcomp latexsym amssymb stmaryrd euscript wasysym</code> <code>pifont manfnt bbding undertilde ifsym tipa tipx extraipa</code> <code>wsuipa phonetic ulsy ar metre txfonts mathabx fclfont</code> <code>skak ascii dingbat skull eurosym esvect yfonts ymath</code> <code>esint mathdots trsym universa upgreek overrightarrow</code> <code>chemarr chemarrow nath trfsigns abracas mathtools</code> <code>phaistos arcs vietnam t4phonet holtpolt semtrans</code> <code>dictsym extarrows protosem harmony hieroglf cclicens</code> <code>mathdesign arev MnSymbol fdsymbol boisik cml extpfeil</code> <code>keystroke fge turnstile simpsons epsdice feyn staves</code> <code>igo colonequals shuffle fourier dozenal pmbboxdraw</code> <code>pigpen clock teubner linearA linearb cypriot sarabian</code> <code>G<sub>A</sub>2e harpoon steinmetz milstd recycle DotArrow</code> <code>ushort hhcount ogonek combelow musixtex ccicons</code> <code>adfsymbols adorn bigints soyombo tfruee knitting</code> <code>textgreek begriff frege countriesofeurope cookingsymbols</code> <code>prodint epiolmec mdwmath rsfs fontawesome5 stix</code> <code>hands greenpoint nkarta astrosym webomints moonphase</code> <code>dancers semaphor umranda umrandb cryst starfont</code> <code>tikzsymbols dice apl go magic bartel-chess-fonts</code> <code>actuarialangle <i>lily&amp;lyps</i> knot bclgo bullcntr rubikcube</code> <code>svrsymbols halloweenmath old-arrows allrunes emf</code> <code>esrelation oplotsymb cmupint realhats euflag scsnowman</code> <code>endofproofwd mismath musicography rojud utfsym</code> <code>worldflags plimsoll twemojis sacsymb overarrows resmes</code> <code>pdfmsym sillypage academicons typicons figbas asapsym</code> <code>fontmfizz hamnosys figchild logix pgfornament lcircuit</code> <code>quantikz accents nicefrac xfakebold junicode mathrsfs</code> <code>chancery urwchancal calligra bbold mbboard dsfont bbm</code> <code>dsserif</code>
Packages omitted:	<i>none</i>

TABLE 698: Package versions used in the preparation of this document

Name	Date	Name	Date	Name	Date
textcomp	2020-02-02	latexsym	1998-08-17	amssymb	2013-01-14
stmaryrd	1994-03-03	euscript	2009-06-22	wasysym	2020-01-19
pifont	2020-03-25	manfnt	1999-07-01	bbding	1999-04-15
undertilde	2000-08-08	ifsym	2000-04-18	tipa	2002-08-08
tipx	2003-01-01	wsuipa	1994-07-16	ar	2012-01-23
metre	2001-12-05	txfonts	2008-01-22	mathabx	2003-07-29
skak	2018-01-08	ascii	2006-05-30	dingbat	2001-04-27
skull	2002-01-23	eurosym	1998-08-06	yfonts	2019-04-04
mathdots	2014-06-11	trsym	2000-06-25	universa	2019-08-26
upgreek	2003-02-12	chemarr	2016-05-16	abraces	2022-11-06
mathtools	2022-06-29	phaistos	2004-04-23	arcs	2004-05-09
t4phonet	2004-06-01	semtrans	1998-02-10	dictsym	2004-07-26
extarrows	2020-03-12	protosem	2005-03-18	harmony	2007-05-04
hieroglf	2015-06-02	ccllicenses	2005-05-20	MnSymbol	2007-01-21
fdsymbol	2011-11-01	boisik	2009-08-21	extpfeil	2009-10-31
keystroke	2010-04-23	fge	2015-05-19	turnstile	2007-06-23
epsdice	2007-02-15	feyn	2022-07-20	colonequals	2016-05-16
shuffle	2008-10-27	dozenal	2018-05-11	pmbboxdraw	2019-12-05
pigpen	2008-12-07	clock	2001-04-10	teubner	2023-08-25
linearA	2006-03-13	linearb	2005-06-22	cyriot	2009-05-22
sarabian	2005-11-12	QpA2e	1997-06-01	harpoon	1994-11-02
steinmetz	2009-06-14	milstd	2009-06-25	DotArrow	2007-02-12
ushort	2001-06-13	hhcount	1995-03-31	ogonek	1995-07-17
combelow	2010-05-02	musixtex	2001-07-08	ccicons	2017-10-30
adorn	2019-10-13	bigints	2010-02-15	soyombo	1996-09-01
tfrupee	2010-12-15	knitting	2019-04-03	textgreek	2011-10-09
frege	2012-08-04	countriesofeuropa	2018-12-29	cookingsymbols	2014-12-28
epiolmec	2003-11-05	mdwmath	1996-04-11	fontawesome5	2022-05-02
stix	2018-04-17	starfont	2010-09-29	tikzsymbols	2021-12-14
actuarialangle	2019-06-13	bclogo	2016-01-10	bullcntr	2007-04-02
rubikcube	2018-02-25	svrsymbols	2019-02-12	halloweenmath	2019-11-01
emf	2016-09-09	oplotsymb1	2017-08-04	cmupint	2020-04-13
realhats	2022-06-13	euflag	2020-05-22	scsnowman	2023-02-23
musicography	2023-09-08	rojud	2020-10-25	utfsym	2022-04-17
plimsoll	2020-10-09	twemojis	2021-04-19	sacsymb	2023-02-06
overarrows	2023-02-15	resmes	2022-12-27	sillypage	2023-03-04
academicons	2021-11-26	typicons	2015-05-20	asapsym	2016-03-20
fontmfizz	2017-03-19	hamnosys	2022-02-08	figchild	2022-03-22
logix	2022-06-22	pgfornament	2020-05-26	quantikz	2023-05-24
accents	2006-05-12	nicefrac	1998-08-04	xfakebold	2023-11-21
calligra	2012-04-10				

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# Index

Similar-looking glyphs are compressed into a single index entry with a superscript “+” indicating that glyph variations exist. For example, the entry “integral, contour ( $\oint$ )<sup>+</sup>” presents only “ $\oint$ ” but indicates that variations also are available. In this case, those variations are “ $\oint$ ”, “ $\oint$ ”, “ $\oint$ ”, “ $\oint$ ”, “ $\oint$ ”, and “ $\oint$ ”—essentially font differences along the lines of “A” vs. “A” vs. “A”. Substantially different glyphs with the same name are not merged. For example, both “ $\times$ ” and “ $\prod$ ” are presented for “product”.

Accents are shown over/under a gray box (e.g., “ $\acute{a}$ ” for “accents, acute”). Symbols appearing in a table that spans pages sometimes are associated with all of the pages that table covers. The author hopes to correct this issue in a future version of the Comprehensive L<sup>A</sup>T<sub>E</sub>X Symbol List.

Numbers	
0 (0)	154
boxed, blue (0)	302
Epi-Olmec (0)	210
old style (o)	34
1	154
1	270
boxed, blue (1)	302
circled (1)	189
circled, filled (1) <sup>+</sup>	189
Epi-Olmec (1)	210
hieroglyphic (i)	202
Linear B (1)	205
old style (1)	34
superior (1)	160, 383
tally	
	268
•	269
2	154
2	270
barred (2)	22
boxed, blue (2)	302
circled (2)	189
circled, filled (2) <sup>+</sup>	189
Epi-Olmec (2)	210
Linear B (2)	205
old style (2)	34
rotated (z) <sup>+</sup>	24, 155
superior (2)	160, 383
tally	
	268
••	269
3	154
3	270
boxed, blue (3)	302
circled (3)	189
circled, filled (3) <sup>+</sup>	189
Epi-Olmec (3)	210
Linear B (3)	205
old style (3)	34
rotated (g) <sup>+</sup>	24, 155
runic (s)	211
superior (3)	160, 383
tally	
	268
•••	269
4	154
4	270
boxed, blue (4)	302
circled (4)	189
circled, filled (4) <sup>+</sup>	189
Epi-Olmec (4)	210
hooked (4)	23
Linear B (4)	205
old style (4)	34
runic (t)	211
tally	
	268
5	154
5	270
boxed, blue (5)	302
circled (5)	189
circled, filled (5) <sup>+</sup>	189
Epi-Olmec (5)	210
Linear B (5)	205
old style (5)	34
runic (u)	211
tally	
	268
••••	269
6	154
6	270
boxed, blue (6)	302
circled (6)	189
circled, filled (6) <sup>+</sup>	189
Epi-Olmec (6)	210
Linear B (6)	205
old style (6)	34
runic (v)	211
tally (•••••)	269
7	154
7	270
boxed, blue (7)	302
circled (7)	189

circled, filled (7)<sup>+</sup> . . . 189  
 Epi-Olmec (𐄀) . . . 210  
 Linear B (𐄁) . . . 205  
 old style (7) . . . 34  
 runic (𐄂) . . . 211  
 tally (𐄃) . . . 269

8  
 8 . . . 154  
 8 . . . 270  
 8 ball (8) . . . 296  
 boxed, blue (8) . . . 302  
 circled (8) . . . 189  
 circled, filled (8)<sup>+</sup> . . . 189  
 Epi-Olmec (𐄄) . . . 210  
 Linear B (𐄅) . . . 205  
 old style (8) . . . 34  
 runic (𐄆) . . . 211  
 tally (𐄇) . . . 269

9  
 9 . . . 154  
 9 . . . 270  
 boxed, blue (9) . . . 302  
 circled (9) . . . 189  
 circled, filled (9)<sup>+</sup> . . . 189  
 Epi-Olmec (𐄈) . . . 210  
 Linear B (𐄉) . . . 205  
 old style (9) . . . 34  
 tally (𐄉) . . . 269

10 (10) . . . 270  
 boxed (10) . . . 313  
 boxed, blue (10) . . . 302  
 circled (10) . . . 189  
 circled, filled (10)<sup>+</sup> . . . 189  
 Epi-Olmec (𐄊) . . . 210  
 hieroglyphic (𐄋) . . . 202  
 Linear B (𐄌) . . . 205

11  
 Epi-Olmec (𐄍) . . . 210

12  
 Epi-Olmec (𐄎) . . . 210

13  
 Epi-Olmec (𐄏) . . . 210

14  
 Epi-Olmec (𐄐) . . . 210

15  
 Epi-Olmec (𐄑) . . . 210

16  
 Epi-Olmec (𐄒) . . . 210

17  
 Epi-Olmec (𐄓) . . . 210

18  
 Epi-Olmec (𐄔) . . . 210

19  
 Epi-Olmec (𐄕) . . . 210

20  
 Epi-Olmec (𐄖) . . . 210  
 Linear B (𐄗) . . . 205

30  
 Linear B (𐄘) . . . 205

40  
 Linear B (𐄙) . . . 205

50  
 Linear B (𐄚) . . . 205

60  
 Linear B (𐄛) . . . 205

70  
 Linear B (𐄜) . . . 205

80  
 Linear B (𐄝) . . . 205

90  
 Linear B (𐄞) . . . 205

100  
 hieroglyphic (𐄟) . . . 202  
 Linear B (𐄠) . . . 205

200  
 Linear B (𐄡) . . . 205

300  
 Linear B (𐄢) . . . 205

400  
 Linear B (𐄣) . . . 205

500  
 500px (500) . . . 315–318  
 Linear B (𐄤) . . . 205

600  
 Linear B (𐄥) . . . 205

700  
 Linear B (𐄦) . . . 205

800  
 Linear B (𐄧) . . . 205

900  
 Linear B (𐄨) . . . 205

1000  
 hieroglyphic  
 𐄩 . . . 202  
 𐄪 . . . 202  
 𐄫 . . . 202  
 Linear B (𐄬) . . . 205

1000000  
 hieroglyphic (𐄭) . . . 202

**A**  
 A (A) . . . 162  
 a (a)<sup>+</sup> . . . 22, 24, 25

A with ring  
 lowercase (â) . . . 20  
 math mode . . . *see* accents,  
 ring  
 uppercase (Å)<sup>+</sup> . . . 20, 124

abacus (𐄮) . . . 292

abajour  
 𐄯 . . . 325–327  
 𐄰 . . . 325–327  
 𐄱 . . . 325–327  
 𐄲 . . . 325–327

abracas (package) . 144, 387, 388

absent/void bunch (∅) . . . 82

absolute value (| $\square$ |) . . . . . *see*  
 delimiters, vertical bar

abzüglich (%) . . . . . *see* minus,  
 commercial

Academia  
**A** . . . 330–331  
**A** . . . 330–331

academic profile symbols 330–331

academicons (package) 330, 331,  
 387, 388














accents (package)<sup>+</sup> . . . 26–  
 31, 136–139, 141–145, 217,  
 373–375, 387, 388















accents  
 acute (´)<sup>+</sup> 26–29, 31, 136,  
 137  
 acute below, inverted (◌̑) 27  
 acute, double (ˆ)<sup>+</sup> . 26, 31  
 almost equal to (≈) . . . 28  
 angle below, left (◌̑) . . . 28  
 angle, left (◌̑) . . . . . 137  
 any character as . . . . . 374  
 arc (⤵)<sup>+</sup> . . . 26–30, 139–142  
 arc below, inverted (◌̑)<sup>+</sup> 26,  
 30  
 arch below, inverted double  
 (◌̑) . . . . . 28  
 arch, inverted double (◌̑) 27  
 arrow below, double-ended  
 (◌̑)<sup>+</sup> . . . . . 28, 138, 143  
 arrow below, left (◌̑)<sup>+</sup> 138,  
 143  
 arrow below, right (◌̑)<sup>+</sup> 28,  
 138, 143  
 arrow below, up (◌̑) . . . 28  
 arrow, curved right (◌̑) 142






































- arrow, double-ended (↔)<sup>+</sup> . . . . . 138, 143  
 arrow, left (←)<sup>+</sup> . 137, 138, 143  
 arrow, right (→)<sup>+</sup> 136–138, 142, 143  
 arrowhead below, left (⤵) 28  
 arrowhead below, right (⤴) . . . . . 28  
 asterisk (\*) . . . . . 137  
 bar (▬)<sup>+</sup> 36, 136, 139, 141, 144  
 bar below (▮)<sup>+</sup> 26, 27, 139, 144, 145  
 bar below, double (▮▮)<sup>+</sup> 28, 145  
 bat (⚡)<sup>+</sup> . . . . . 138, 150  
 bat below (⚡<sub>▮</sub>)<sup>+</sup> . . 138, 150  
 brace ({}<sup>+</sup>) . 139–141, 144  
 brace below, inverted ({}<sub>▮</sub>)<sup>+</sup> . . . . . 139–141, 144  
 bracket (⌈<sup>+</sup>) 141, 374, 375  
 bracket below, inverted (⌋<sup>+</sup>) . . . . . 141, 374, 375  
 breve (˘)<sup>+</sup> 26–29, 31, 136, 137  
 breve below, inverted (˘<sub>▮</sub>)<sup>+</sup> . . . . . 27–29  
 breve, below (˘) . . . . . 30  
 breve, Cyrillic (˘̣)<sup>+</sup> . . . 26  
 breve, inverted (˘̂)<sup>+</sup> 26, 27, 29  
 bridge (⌒)<sup>+</sup> . . . . . 28, 137  
 bridge above and below (⌒̂̂) . . . . . 28  
 bridge below (⌒<sub>▮</sub>)<sup>+</sup> . . 27, 28  
 bridge below, inverted (⌒<sub>▮</sub>) 27  
 broom below, left (⚏<sub>▮</sub>) . 149  
 broom below, right (⚏<sub>▮</sub>) 149  
 broom, left (⚏) . . . . . 149  
 broom, right (⚏) . . . . . 149  
 candrabindu (◌̣) . . . . . 137  
 caron (ˇ)<sup>+</sup> 26, 31, 136, 137, 141, 143  
 caron below (ˇ<sub>▮</sub>) . . . . . 28  
 cedilla (¸)<sup>+</sup> . . . . . 26, 383  
 cedilla, reversed (¸̂) . . 29  
 circle overlay (◌̅) . . . . . 168  
 circumflex (ˆ)<sup>+</sup> 26–28, 136, 137, 139–141, 143  
 circumflex below (ˆ<sub>▮</sub>) . . 27  
 combination acute and caron (◌̇̈)<sup>+</sup> . . . . . 26  
 combination acute and macron (◌̇̄) . . . . . 26  
 combination breve and macron (◌̆̄) . . . . . 26  
 combination circumflex and acute (◌̂̇) . . . . . 26  
 combination circumflex and dot (◌̂̇) . . . . . 26  
 combination dot and acute (◌̇̈) . . . . . 27  
 combination dot and breve (◌̇̆) . . . . . 27  
 combination grave and circumflex (◌̂̄) . . . . . 27  
 combination grave and dot (◌̄̇) . . . . . 27  
 combination grave and macron (◌̄̆)<sup>+</sup> . . . . . 27  
 combination macron and acute (◌̇̄) . . . . . 27  
 combination ring and arc (◌̆̂̂)<sup>+</sup> . . . . . 139, 141, 142  
 combination ring and macron (◌̆̄̂) . . . . . 27  
 combination tilde and dot (◌̇̃) . . . . . 28  
 comma (ˆ) . . . . . 137  
 comma below (ˆ<sub>▮</sub>)<sup>+</sup> . . . 30  
 comma, inverted (ˆ̂) . . 137  
 decorative hat . . . . . 138  
 diæresis (̈)<sup>+</sup> . . 26, 29, 31, 136, 163  
 diæresis below (̈<sub>▮</sub>)<sup>+</sup> 28–30  
 dot (◌̇)<sup>+</sup> . . . 26, 136, 137  
 dot below (◌̇<sub>▮</sub>)<sup>+</sup> . . . . . 26, 27  
 dot, double (◌̇̇)<sup>+</sup> . 136, 137  
 dot, quadruple (◌̇̇̇̇)<sup>+</sup> 136, 137  
 dot, triple (◌̇̇̇)<sup>+</sup> . 136, 137  
 extensible . 139–142, 144, 145, 151, 171, 374–375  
 falling and rising tone (◌̎) 27  
 fang (◌̃) . . . . . 26  
 fang, double (◌̃̃) . . . . . 26  
 fermata (◌̇̇̇̇)<sup>+</sup> . . . . . 217  
 ghost (◌̇̇̇̇)<sup>+</sup> . . . . . 150  
 ghost below (◌̇̇̇̇<sub>▮</sub>)<sup>+</sup> . . . 150  
 grave (◌̄)<sup>+</sup> 26–29, 31, 136, 137  
 grave below, inverted (◌̄<sub>▮</sub>) 27  
 grave, double (◌̄̄)<sup>+</sup> 26, 27, 29  
 group (◌<sub>▮</sub>)<sup>+</sup> . . . . . 140, 141  
 group below, inverted (◌<sub>▮</sub>)<sup>+</sup> . . . . . 140, 141  
 háček (ˇ̣)<sup>+</sup> . . . *see* accents, caron  
 half ring below, left (◌̆̆) 27  
 half ring below, right (◌̆̆) 27  
 harpoon below, left down (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . . . 144, 148  
 harpoon below, left up (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . 138, 141, 143, 148  
 harpoon below, left up, right down (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . . . 138, 143  
 harpoon below, right down (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . . . 144, 148  
 harpoon below, right up (◌̆̆<sub>▮</sub>)<sup>+</sup> . . 138, 141, 143, 148  
 harpoon below, right up, left down (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . . . 138, 143  
 harpoon, left down (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . . . 140, 144, 148  
 harpoon, left up (◌̆̆<sub>▮</sub>)<sup>+</sup> 137, 138, 140, 141, 143, 144, 148  
 harpoon, left up, right down (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . . . 138, 143  
 harpoon, right down (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . . . 144, 148  
 harpoon, right up (◌̆̆<sub>▮</sub>)<sup>+</sup> 137, 138, 140, 141, 143, 144, 148  
 harpoon, right up, left down (◌̆̆<sub>▮</sub>)<sup>+</sup> . . . . . 138, 143  
 hat (◌̂)<sup>+</sup> . . . . . *see* accents, circumflex  
 hat, literal . . . . . 138  
 high rising tone (◌̎̎) . . . 27  
 homothetic (◌̎̎) . . . . . 28  
 hook (◌̆̆̆)<sup>+</sup> . . . . . 26, 137  
 hook below, inverted and reversed (◌̆̆̆<sub>▮</sub>) . . . . . 27  
 Hungarian umlaut (◌̆̆̆)<sup>+</sup> *see* accents, acute, double  
 krouzek (◌̆̆̆)<sup>+</sup> . *see* accents, ring  
 line segment (◌̅<sub>▮</sub>)<sup>+</sup> . . . 140  
 line segment below (◌̅<sub>▮</sub>)<sup>+</sup> . . . . . 140  
 low rising tone (◌̎̎) . . . 27  
 macron (◌̄)<sup>+</sup> . . 26–29, 31, 136, 137, 139, 141  
 macron overlay (◌̅) . . . 137  
 multiple per character 26–28, 373  
 ogonek (◌̇̇)<sup>+</sup> . . . . . 26–30








































































- parenthesis (⸀)<sup>+</sup> . . . . 28,  
 139–142, 374, 375  
 parenthesis below, inverted  
 (⸁)<sup>+</sup> . . . . 141, 374, 375  
 pitchfork below, left (⸂) 149  
 pitchfork below, right (⸃) .  
 . . . . . 149  
 pitchfork, left (⸄) . . . . 149  
 pitchfork, right (⸅) . . . . 149  
 plus below (⸆) . . . . . 27  
 ring (⸇)<sup>+</sup> . . . . 26–28, 31, 136,  
 137  
 ring below (⸈)<sup>+</sup> . . . . 27, 29  
 rising and falling tone (⸉) 27  
 seagull below (⸊) . . . . 27  
 solidus overlay (⸋)<sup>+</sup> . . . . 137,  
 217  
 spiritus asper (⸌) . . . . 137  
 spiritus lenis (⸍) . . . . 137  
 square below (⸎) . . . . 27  
 tack below, down (⸏) . . . . 27  
 tack below, left (⸐) . . . . 26  
 tack below, right (⸑) . . . . 27  
 tack below, up (⸒) . . . . 27  
 tie (⸓) . . . . . 26  
 tilde (⸔)<sup>+</sup> . . . . 26, 29, 136, 137,  
 139–141, 143, 144, 217, 374  
 tilde below (⸕)<sup>+</sup> . . . . 27, 29, 144  
 tilde overlay (⸖)<sup>+</sup> . . . . 28, 168  
 tilde, crossed (⸗) . . . . 28  
 tréma (⸘)<sup>+</sup> . . . . *see* accents,  
 diæresis  
 triangle (⸙) . . . . . 139  
 umlaut (⸚)<sup>+</sup> . . . . *see* accents,  
 diæresis  
 vertical line (⸛)<sup>+</sup> . . . . 28, 29  
 vertical line below (⸜)<sup>+</sup> . . . . 28,  
 29  
 vertical line below, double  
 (⸝) . . . . . 28  
 vertical line overlay (⸞) 168  
 vertical line, double (⸟)<sup>+</sup> . . . . 27,  
 29  
 voiced consonant, final par-  
 tial (⸠) . . . . . 28  
 voiced consonant, initial par-  
 tial (⸡) . . . . . 28  
 voiced consonant, partial (⸢)  
 . . . . . 28  
 voiceless consonant, final par-  
 tial (⸣) . . . . . 28  
 voiceless consonant, initial  
 partial (⸤) . . . . . 28  
 voiceless consonant, partial  
 (⸥) . . . . . 28  
 witch on broom (⸦)<sup>+</sup> 150  
 witch on broom below  
 (⸧)<sup>+</sup> . . . . . 150  
 witch on pitchfork (⸨)<sup>+</sup> .  
 . . . . . 150  
 witch on pitchfork below  
 (⸩)<sup>+</sup> . . . . . 150  
 X (⸪) . . . . . 27  
 accessibility (⸬) . . . . 173–175  
 Accessible (⸭) . . . . 315–318  
 Acclaim  
 ⸮ . . . . . 330–331  
 ⸯ . . . . . 330–331  
 accordion (⸰) . . . . . 292  
 accordion notation . . . . . 220  
 ⸱ . . . . . 220  
 ⸲ . . . . . 220  
 ⸳ . . . . . 220  
 ⸴ . . . . . 220  
 ⸵ . . . . . 220  
 ⸶ . . . . . 220  
 ⸷ . . . . . 220  
 ⸸ . . . . . 220  
 ⸹ . . . . . 220  
 Accusoft (⸺) . . . . 315–318  
 acid-free paper (⸻) . . . . 155  
 ACM  
 ⸽ . . . . . 330–331  
 ⸾ . . . . . 330–331  
 ACM Digital Library  
 ⸿ . . . . . 330–331  
 ⸎ . . . . . 330–331  
 Acquisitions Incorporated (⸞) .  
 . . . . . 315–318  
 actuarial angle (⸠)<sup>+</sup> . . . . 145, 374  
 actuarialangle (package) . . . . 145,  
 374, 387, 388  
 actuarialsymbol (package) . . . . 374  
 acute (⸡)<sup>+</sup> . . . . *see* accents, acute  
 ad (Ad) . . . . . 173–175  
 add to shopping cart (⸢) 173–  
 175  
 additive or (⸣) . . . . . 161  
 address book  
 ⸤ . . . . . 173–175  
 ⸥ . . . . . 173–175  
 address card  
 ⸦ . . . . . 173–175  
 ⸧ . . . . . 173–175  
 adeles (A) *see* alphabets, math  
 adorn (package) . . . . 180, 190, 191,  
 197, 198, 387, 388  
 adfsymbols (package) . . . . 180, 186,  
 190, 196, 387  
 adhesive bandage (⸩) . . . . 292  
 adjoint (†) . . . . . *see* dagger  
 adjust brightness (⸬) . . . . 171–172  
 adjust contrast  
 ⸭ . . . . . 173–175  
 ⸮ . . . . . 171–172  
 Admetus (ⸯ) . . . . . 168  
 admission tickets  
 ⸰ . . . . . 292  
 ⸱ . . . . . 313  
 ADN (⸲) . . . . . 315–318  
 Adobe Acrobat . . . . . 379  
 ADS  
 ⸳ . . . . . 330–331  
 ⸴ . . . . . 330–331  
 adsorbate (Δ) . . . . . 177  
 adsorbent (⸶) . . . . . 177  
 Adversal (⸷) . . . . . 315–318  
 aerial tramway  
 ⸸ . . . . . 320  
 ⸹ . . . . . 254  
 aeronautics (⸺) . . . . . 275  
 affiliate theme (⸻) . . . . 315–318  
 AfricArXiv  
 ⸽ . . . . . 330–331  
 ⸾ . . . . . 330–331  
 after (⸞) . . . . . 208–210  
 agriculture (⸰) . . . . . 275  
 air (Δ) . . . . . 168  
 air freshener (⸱) . . . . 323–325  
 Airbnb (⸲) . . . . . 315–318  
 airplane . . . . . 254, 320–325  
 ⸳ . . . . . 198  
 ⸴ . . . . . 320  
 ⸵ . . . . . 323–325  
 ⸶ . . . . . 325–327  
 ⸷ . . . . . 325–327  
 ⸸ . . . . . 322  
 ⸹ . . . . . 321  
 ⸺ . . . . . 320  
 ⸻ . . . . . 254  
 ⸼ . . . . . 254  
 ⸽ . . . . . 254  
 ⸾ . . . . . 254  
 ⸿ . . . . . 199  
 landing (⸰)<sup>+</sup> . . . . 254, 320,  
 328–329


























































































- military  
   ↑ ..... 254  
   ✈ ..... 323–325  
 paper (✈) ..... 323–325  
 slashed (✂) ..... 328–329  
 taking off (✈)<sup>+</sup> . 254, 320, 328–329  
 Albania (🇦🇱) ..... 242  
 alembic (🍷) ..... 292  
 aleph (ℵ)<sup>+</sup> ..... 122, 123, 157  
 Algolia (🇲🇦) ..... 315–318  
 alien ..... *see* extraterrestrial  
 alif (ⵀ) ..... 25  
 align center (☰) ..... 173–175  
 align justify (☰) ..... 173–175  
 align left (☰) ..... 173–175  
 align right (☰) ..... 173–175  
 Alipay (🇨🇳) ..... 315–318  
  
 alla breve (♩)<sup>+</sup> 214, 216, 217, 219, 220  
   reversed (♩) ..... 214  
 alligator  
   🐊 ..... 264–267  
   🐊 ..... 264–267  
 allrunes (package) ... 211, 387  
 alpha  
   lowercase (α)<sup>+</sup> 20, 24, 120, 121  
   uppercase (Α)<sup>+</sup> . . . 20, 120  
 alphabets ..... 20–25, 120–123, 163, 201, 202, 205, 207, 208, 270, 368  
 African ..... 21  
 Cypriot ..... 207  
 Cyrillic ..... 368  
 Greek 20, 120–122, 163, 208  
 Hebrew .... 122, 123, 163  
 hieroglyphic ..... 202  
 Linear A ..... 202  
 Linear B ..... 205  
 math ..... 162  
 phonetic ..... 22–25  
 proto-Semitic ..... 201  
 South Arabian ..... 207  
 Vietnamese ..... 21  
 Alpine Linux (🇨🇳) ... 318–319  
 alpine symbols ..... 259  
 alternating current  
   ~ ..... 164  
   ∞ ..... 159  
  
 alternative denial  
   ↑ ..... *see* arrow  
   | ..... *see* vertical bar  
 Amazon (🇺🇸) ..... 315–318  
 Amazon Pay  
   🇺🇸 ..... 315–318  
   🇺🇸 ..... 315–318  
 Amazon Web Services  
   aws ..... 315–318  
   🇺🇸 ..... 318–319  
 ambulance  
   🚑 ..... 319  
   🇺🇸 ..... 320  
   🚑 ..... 254  
 American Express (🇺🇸) 315–318  
 Amilia (🇮🇹) ..... 315–318  
 Amor (🇻🇪) ..... 168  
 ampersand (&)<sup>+</sup> 18, 37, 38, 41, 44, 67, 161, 381  
   inverted (⌘)<sup>+</sup> . . . 38, 39, 41, 42, 44, 67, 161  
 amphora  
   🏺 ..... 206  
   🏺 ..... 292  
   🏺 ..... 312  
 $\mathcal{AMS}$  (package) ..... 16, 20, 38, 54, 68, 82, 85, 91, 94, 95, 112, 119, 120, 122, 123, 126, 128, 136, 140, 145, 151, 155, 157, 163, 364, 365, 386  
 amsbsy (package) ..... 380  
 amsfonts (package) ... 157, 162  
 amsmath (package) 16, 65, 136, 369, 379  
 amssymb (package) 16, 136, 157, 162, 208, 387, 388  
 amstext (package) ... 370, 372  
 anaclasis (÷)<sup>+</sup> ..... 271  
 anchor  
   ⚓ ..... 284  
   ⚓ ..... 198  
   ⚓ ..... 323–325  
   ⚓ ..... 343–346  
   ⚓ ..... 322  
   ⚓ ..... 292  
 ancient-language symbols . 200–211  
 and (Λ) ..... *see* wedge  
 AND gates ..... 170, 357–358  
 and then (🇪🇺) ..... 208–210  
 Andorra (🇦🇩) ..... 242  
 Android  
   🇺🇸 ..... 315–318  
  
   🇺🇸 ..... 314  
 angel  
   👼 ..... 331  
   👼 ..... 292  
   👼 ..... 312  
 AngelList (🇺🇸) ..... 315–318  
 anger (😡)<sup>+</sup> ..... 292, 312  
 angle (∠)<sup>+</sup> ..... 155–157  
   3-D (∟) ..... 156  
   measured, with arrow (↗)<sup>+</sup> ..... 156  
   obtuse (∟)<sup>+</sup> ..... 156  
   right  
     ∟<sup>+</sup> ..... 156  
     ∟<sup>+</sup> ..... 156  
     ∟<sup>+</sup> ..... 156, 160  
     ∟<sup>+</sup> ..... 156  
   spherical (∠)<sup>+</sup> . . . 154–158  
   with S (∠) ..... 156  
   with underbar (∠)<sup>+</sup> . . . 156  
 angle brackets . . *see* delimiters  
   blackboard bold (< >) 163  
 Anglo-Frisian runes ..... 211  
 Angry Creative (🇺🇸) . 315–318  
 Ångström unit (Å) . *see* A with ring  
 Angular  
   🇺🇸 ..... 315–318  
   🇺🇸 ..... 318–319  
   🇺🇸 ..... 318–319  
 angular minutes ..... *see* prime  
 angular seconds ..... *see* prime, double  
 animals 200, 202, 206, 262–263, 268, 327, 343–346  
 ankh  
   † ..... 257  
   ♀ ..... 310  
 annuity symbols (🇺🇸) . . 137, 145, 374  
 answering machine (📞) ..... 171  
 ant  
   🐜 ..... 264–267  
   🐜 ..... 264–267  
   🐜 ..... 262  
   🐜 ..... 268  
 antelope (🇺🇸) ..... 264–267  
 antenna (🇺🇸) ..... 329  
 antidiple  
   <<sup>+</sup> ..... 271

$\lessgtr^+$  ..... 271  
 antilabe ( $::$ ) ..... 153  
 antimuon ( $\mu^+$ ) ..... 177  
 antineutrino ( $\bar{\nu}$ ) ..... 177  
 antineutron ( $\bar{n}$ ) ..... 177  
 antiproton ( $p^-$ ) ..... 177  
 antiquark ( $\bar{q}$ ) ..... 177  
   b ( $\bar{b}$ ) ..... 177  
   c ( $\bar{c}$ ) ..... 177  
   d ( $\bar{d}$ ) ..... 177  
   s ( $\bar{s}$ )<sup>+</sup> ..... 177–178  
   t ( $\bar{t}$ ) ..... 177  
   u ( $\bar{u}$ ) ..... 178  
 antisigma ( $\supset$ )<sup>+</sup> ..... 271  
 anyon ( $\mathcal{A}$ ) ..... 178  
 Apache () ..... 318–319  
 apl (package) ..... 169, 387  
 Apollo () ..... 168  
 App Store  
    ..... 315–318  
    ..... 315–318  
 appear () ..... 208–210  
 append ( $\triangleright$ ) ..... 161  
 Apper (<sup>apper</sup>) ..... 315–318  
 Apple ()<sup>+</sup> ..... 314–318  
 apple  
    ..... 286–287  
    ..... 285  
    ..... 285  
    ..... 287  
    ..... 287  
 Apple Pay  
    ..... 315–318  
    ..... 315–318  
 approximately equal to  
    $\approx^+$  . . . 67, 68, 70, 73, 76, 77  
    $\cong^+$  ..... 68, 70, 73, 76, 77  
    $\cong$  ..... 77  
   colon ( $\approx:$ ) ..... 81  
   colon, double ( $\approx::$ ) . . . 81  
   hat ( $\hat{\approx}$ ) ..... 77  
   negated  
      $\not\approx^+$  . . . 69, 70, 72, 74, 78  
      $\not\approx$  ..... 69, 72, 74  
      $\not\cong$  ..... 78  
   reversed  
      $\approx$  ..... 70  
      $\cong$  ..... 70  
   reversed, negated  
      $\not\approx$  ..... 72  
      $\not\cong$  ..... 72  
 approximately equivalent to ( $\approx$ )<sup>+</sup>  
   . . . 71, 73, 74, 77, 369


















negated ( $\not\approx$ )<sup>+</sup> ..... 72, 75  
 reversed ( $\approx$ ) ..... 70  
 reversed, negated ( $\not\approx$ ) . . . 72  
 Aquarius ( $\approx$ )<sup>+</sup> . . . 166–168, 292,  
   335–338  
 ar (package) . . . . 165, 387, 388  
 arc  
    ..... 160  
   <sup>+</sup> ..... *see* accents, arc  
   lower left ( $\curvearrowleft$ ) ..... 159  
   lower right ( $\curvearrowright$ ) ..... 159  
   upper left ( $\curvearrowleft$ )<sup>+</sup> . . . 159, 255  
   upper right ( $\curvearrowright$ )<sup>+</sup> . . . 159, 255  
 Arch Linux () . . . . 318–319  
 architecture () ..... 275  
 Archive  
    ..... 330–331  
    ..... 330–331  
 archive () ..... 171–172  
 archway () ..... 323–325  
 arcminutes ..... *see* prime  
 arcs (package) . . . . 30, 387, 388  
 arcseconds .. *see* prime, double  
 area chart  
    ..... 173–175  
    ..... 171–172  
    ..... 171–172  
 arev (package) .. 180, 183, 184,  
   187, 213, 234, 284, 387  
 Aries ( $\Upsilon$ )<sup>+</sup> . . . . 166–168, 292,  
   335–338  
 arm  
   mechanical () ..... 291  
 armadillo () . . . 264–267  
 arrow ( $\rightarrow$ )<sup>+</sup> .....  
   . . . 23–24, 31, 36–38, 81, 90,  
   94–114, 127, 130, 131, 139,  
   145–148, 168–170, 173–175,  
   179–182, 193, 200, 206, 219,  
   221, 231, 253, 255, 274–  
   275, 282, 290–305, 333–334,  
   358–359, 366–368, 370–372,  
   379  
   accents 112, 137, 139–141,  
     144–148  
   bent ( $\rightharpoonup$ )<sup>+</sup> 94–96, 100, 101,  
     105–108  
   buttons ()<sup>+</sup> 295–297, 301,  
     303  
   circle centered ( $\circlearrowright$ )<sup>+</sup> . . . 107  
   circular ( $\curvearrowright$ )<sup>+</sup> . . . . 94, 95,  
     97–103, 105–107, 109, 193,  
     194, 253  
   crossing ( $\times$ )<sup>+</sup> . . . 107, 108


























crossing, dingbat () 173–  
   175  
 curved ( $\curvearrowright$ )<sup>+</sup> . . . . 94–105,  
   107–109, 171  
 dashed ( $\dashrightarrow$ )<sup>+</sup> . . . 94–109, 113  
 diagonal, for reducing subex-  
   pressions ..... 139  
 dingbat ..... 179–182  
    ..... 154  
    ..... 179  
    ..... 179  
    ..... 179  
    ..... 179  
    ..... 179  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
    ..... 181  
 dotted ( $\dashrightarrow$ )<sup>+</sup> . . . 108, 147  
 double bodied ( $\Rightarrow$ )<sup>+</sup> . . . 36,  
   94–103, 105–109, 111, 127,  
   130, 132  
 double ended ( $\leftrightarrow$ )<sup>+</sup> . . . 36,  
   37, 94–103, 106–109, 111–  
   113, 127, 130, 132, 170, 372  
 double ended, bar under ( $\bar{\leftrightarrow}$ )  
   . . . . . 170  
 double ended, double bodied  
   ( $\Leftrightarrow$ )<sup>+</sup> 94, 96–103, 106,  
   108, 109, 127, 130, 132  
 double headed ( $\Leftrightarrow$ )<sup>+</sup> . . . 23,  
   69, 94, 97, 98, 100–103, 106,  
   108–110, 372  
 double tailed ( $\Rrightarrow$ ) . . . . 206  
 extensible . . . . 139–142,  
   144–148  
 filled ( $\blackrightarrow$ )<sup>+</sup> . . . 105, 106, 181,  
   193  
 fish headed ( $\blacktriangleright$ )<sup>+</sup> . . . 113  
 flat ( $\rightarrow$ )<sup>+</sup> ..... 113  
 fletched ..... 111, 179  
    ..... 111  
    ..... 181  
    ..... 181

























	181	filled ( $\blacktriangleright$ ) <sup>+</sup>	49, 52, 181		190
	181	half filled ( $\blacktriangleright$ ) <sup>+</sup>	180, 181		190
	181	hollow ( $\triangleright$ ) <sup>+</sup>	48, 51		190
	181	outlined ( $\triangleright$ ) <sup>+</sup>	48, 49		190
	181	Arseneau, Donald	370–372, 374		190
	181	artist (  ) <sup>+</sup>	292, 302, 304		190
	181	artist palette			190
fork tailed ( $\Rightarrow$ ) <sup>+</sup>	113		292		190
forked ( $\Upsilon$ ) <sup>+</sup>	38, 105		313		190
hollow ( $\diamond$ )	253	ArtStation ( 	315–318		190
hooked ( $\hookrightarrow$ ) <sup>+</sup>	94, 96–99, 101–104, 106, 108, 110–113	arXiv			297
joined ( $\Upsilon$ ) <sup>+</sup>	38, 105		330–331		302
looped ( $\looparrowright$ ) <sup>+</sup>	94–96, 101, 106, 107, 113	asapsym (package)	181, 271, 307, 310, 320, 321, 327, 387, 388	dotted ( $*$ ) <sup>+</sup>	37
negated ( $\nrightarrow$ ) <sup>+</sup>	94, 96, 98–99, 102–104, 106, 109, 114	ascendant ( $\mathbb{A}^{\text{asc}}$ )	168	metrical ( $\ast$ ) <sup>+</sup>	271
on musical accidentals	219, 231	ascending node ( $\Omega$ ) <sup>+</sup>	166, 167, 335–338	asterism ( $\ast$ )	369
outlined ( $\Rightarrow$ ) <sup>+</sup>	105, 106, 108, 109, 181	ASCII	17, 20, 170, 352, 364, 381–382, 384–386	asteroids	168
overlaid on a circle ( $\oplus$ ) <sup>+</sup>		table	381	astrological symbols	166–168, 334–338
ribbon ( $\Leftrightarrow$ ) <sup>+</sup>	111	ascii (package)	170, 382, 387, 388	astronaut (  ) <sup>+</sup>	292, 302, 304
shadowed (  ) <sup>+</sup>	181	Ash Ketchum’s hat, as math-mode accent (  )	138	astronomical symbols	166–168, 278, 334–338
three ( $\exists$ ) <sup>+</sup>	106, 108	aspect ratio ( $\mathcal{R}$ )	165	astrosym (package)	335, 387
triangle headed ( $\leftrightarrow$ ) <sup>+</sup>	95, 105, 106, 108, 181	assertion	<i>see</i> turnstile	asymmetric braces	144
triple bodied ( $\Leftrightarrow$ ) <sup>+</sup>	94–98, 100–103, 106–109, 111, 131, 132	assistive listening system (  )	320	Asymmetrik (  )	315–318
two ( $\Leftrightarrow$ ) <sup>+</sup>	94–103, 105–109, 111, 139–142, 144–148, 179	assumption ( $\star$ ) <sup>+</sup>	<i>see</i> star, pentagram	asymptotic complexity	<i>see also</i> alphabets, math, 119
two, extensible (  )	147	asterisk ( $*$ ) <sup>+</sup>	19, 22, 37, 39–42, 45–46, 55–56, 159–160, 189, 190, 290–305	asymptotically equal to ( $\asymp$ ) <sup>+</sup>	<i>see</i> equal, asymptotically
two, filled		boxed (  ) <sup>+</sup>	38, 45, 47, 55–56	at sign	
	256	dingbat		@	257
	256		22	@	22
	256		39	@	328
	256		39	@	314
	256		42	atlas (  )	328–329
	313		160	Atlassian (  )	315–318
wavy ( $\rightsquigarrow$ ) <sup>+</sup>	68, 94–109, 113		187	ATM sign (  )	292
with circular tail ( $\circ\rightarrow$ ) <sup>+</sup>			187	atom	
with rectangular body ( $\Leftrightarrow$ ) <sup>+</sup>	111		187		178
with rounded body ( $\Leftrightarrow$ ) <sup>+</sup>	110		187		328–329
with tail ( $\rightarrow$ ) <sup>+</sup>	94, 96–103, 105, 106, 108, 109		189		292
zigzagged ( $\rightsquigarrow$ ) <sup>+</sup>	102, 106, 108, 114, 156		189	atomic math objects	118, 119, 380
arrowhead	48–52, 112, 144, 147, 148, 180, 232		189	aubergine	<i>see</i> eggplant
dotted ( $\triangleright$ ) <sup>+</sup>	50		189	Audible (  )	315–318
			189	audio description (  )	173–175
			189	Austria (  )	242
			189	auto rickshaw (  )	320
			189	automated teller machine (  )	314
			190	automatic telephone recorder ( $\circ$ )	253
			190	automobile	254, 320–321
			190		320
			190		323–325


-  ..... 325–327  
 ..... 325–327  
 ..... 320  
 ..... 320  
 ..... 321  
 ..... 254  
 ..... 254  
 ..... 254  
 crash () ..... 328–329  
 with key () ..... 320  
 Autoprefixer () ... 315–318  
 average ..... 36  
 Avianex () ..... 315–318  
 Aviato () ..... 315–318  
 avocado () ..... 284  
 award () ..... 323–325  
 axe  
 ..... 200  
 ..... 292  
 axes ( ) ..... 156  
 ayn (◌) ..... 25  
 Azure () ..... 318–319
- B**
- B (B) ..... 21, 162  
 babe () ..... 325–327  
 babel (package) 20, 120, 121, 208  
 baby  
 ..... 307  
 ..... 323–325  
 ..... 292  
 ..... 292  
 ..... 307  
 ..... 254  
 baby carriage () ... 323–325  
 Bachmann-Landau notation 119  
 BACK with arrow ()<sup>+</sup> 292, 313  
 Backbone ( ) ..... 318–319  
 backpack ( ) ..... 293  
 backslash (\)<sup>+</sup> 19, 22, 37, 40, 41,  
 61, 127, 129–131, 157, 159,  
 381, 382  
 hollow ()<sup>+</sup> ..... 38, 76  
 negated ()<sup>+</sup> ..... 43, 168  
 backspace  
 ..... 173–175  
 ..... 171–172  
 ..... 171–172  
 bacon  
 ..... 323–325  
 ..... 284
- bacteria  
 ..... 319  
 ..... 319  
 badger ( ) ..... 262  
 badminton  
 ..... 293  
 ..... 241  
 bag membership (€)<sup>+</sup> .. 76, 77  
 bagel ( ) ..... 284  
 baggage claim  
 ..... 320  
 ..... 254  
 baguette bread ( ) ..... 284  
 Bahá'í ( ) ..... 310  
 baht (฿) ..... 31  
 baking plate ( ) ..... 288  
 balance scale ( ) ..... 293  
 bald ( ) ..... 293  
 ball  
 ..... 325–327  
 ..... 325–327  
 ..... 325–327  
 ..... 325–327  
 balloon  
 ..... 293  
 ..... 312  
 balloons  
 ..... 325–327  
 ..... 325–327  
 ballot box with ballot  
 ..... 293  
 ..... 314  
 banana  
 ..... 284  
 ..... 287  
 banana brackets *see* delimiters  
 Bandcamp ( ) ..... 315–318  
 banjo ( ) ..... 293  
 bank  
 ..... 293  
 ..... 314  
 banknote  
 dollar  
 ..... 297  
 ..... 313  
 euro  
 ..... 298  
 ..... 313
- pound  
 ..... 296  
 ..... 313  
 yen  
 ..... 304  
 ..... 313  
 bar chart  
 ..... 173–175  
 ..... 173–175  
 ..... 171–172  
 ..... 171–172  
 ..... 293  
 ..... 313  
 barbecue ( ) .. 286–287  
 barber pole  
 ..... 293  
 ..... 312  
 barcode (▮▮▮▮) ..... 328–329  
 barley (𐍇) ..... 206  
 barred letters ..... 24–25, 369  
 b (b)<sup>+</sup> ..... 22, 24  
 c (c) ..... 22  
 D (D) ..... 20  
 d (d)<sup>+</sup> .. 20, 22, 24, 25, 369  
 esh, double (f) ..... 23  
 g (g)<sup>+</sup> ..... 22  
 h (h)<sup>+</sup> 22, 24, 25, 123, 124,  
 368  
 i (i)<sup>+</sup> ..... 22, 24, 25  
 i, dotless (ı) ..... 25  
 j (j) ..... 25  
 j, dotless (j)<sup>+</sup> ..... 22  
 l (l)<sup>+</sup> ..... 22, 24  
 o (o)<sup>+</sup> .. 22, 24, 38, 41, 47,  
 365  
 P (P) ..... 24  
 u (u)<sup>+</sup> ..... 22, 24, 25  
 Z (Z) ..... 124  
 bars (≡) ..... 173–175  
 Bart ( ) ..... 306  
 bartel-chess-fonts (package) 361,  
 363, 387  
 base twelve ..... 155, 269  
 numerals ..... 155  
 tally markers ..... 269  
 baseball  
 ..... 240  
 ..... 293  
 baseball bat ( ) . 325–327  
 baseball cap ( ) *see* billed cap





basket (🛒) . . . . . 293  
basketball  
 . . . . . 240  
 . . . . . 293  
basketball and hoop (🏀) . . . 241  
bat . . . . . 52, 150  
+ . . . . . 52  
 . . . . . 257  
 . . . . . 264–267  
 . . . . . 262  
as math-mode accent (Ⓜ)+  
. . . see accents, bat  
bathtub  
 . . . . . 323–325  
 . . . . . 293  
 . . . . . 254  
 . . . . . 254  
battery (🔋)+ . . . . . 293, 312  
car (🚗) . . . . . 323–325  
charge (🔌) . . . . . 171–172  
empty (🔋) . . . . . 173–175  
full (🔋)+ . . . . . 171–175  
half (🔋) . . . . . 173–175  
high (🔋) . . . . . 171–172  
low (🔋) . . . . . 171–172  
mid (🔋) . . . . . 171–172  
quarter (🔋) . . . . . 173–175  
three quarters (🔋) 173–175  
Battle.net (🎮) . . . . . 315–318  
Bauhaus forms (⊕) . . . . . 257  
bbrding (package) . . . . . 179,  
182–184, 186, 187, 189, 195,  
198, 365, 387, 388  
bbm (package) . . . . . 162, 387  
bbold (package) . . . . . 162, 387  
bclogo (package) 311, 312, 387,  
388  
beach with umbrella  
 . . . . . 293  
 . . . . . 313  
beaker (🧪) . . . . . 322  
beam (☀️) . . . . . 171  
bear  
 . . . . . 311–312  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267


 . . . . . 264–267  
 . . . . . 262  
 . . . . . 268  
beard mask  
 . . . . . 208–210  
 . . . . . 208–210  
bearing (⚙️) . . . . . 171  
fixed (⚙️) . . . . . 171  
loose (⚙️) . . . . . 171  
bears (🐻) . . . . . 264–267  
beaver (🦫) . . . . . 262  
because (∴)+ . . . see therefore,  
down  
bed  
 . . . . . 290  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 254  
bedeck (🛏️) . . . . . 208–210  
bee  
 . . . . . 200  
 . . . . . 264–267  
 . . . . . 264–267  
beehive (🐝) . . . . . 200  
beer mug  
 . . . . . 323–325  
 . . . . . 322  
 . . . . . 284  
 . . . . . 287  
two, clinking  
 . . . . . 284  
 . . . . . 287  
beginner  
 . . . . . 302  
 . . . . . 313  
begriff (package) . . . . . 153, 387  
Begriffsschrift symbols 153, 154  
Behance  
 . . . . . 315–318  
 . . . . . 315–318  
Belarus (🇧🇪) . . . . . 242  
Belgium (🇧🇪) . . . . . 242  
bell  
 . . . . . 253  
 . . . . . 323–325  
 . . . . . 323–325

 . . . . . 325–327  
 . . . . . 322  
 . . . . . 293  
 . . . . . 293  
 . . . . . 313  
 . . . . . 313  
 . . . . . 254  
slashed  
 . . . . . 293  
 . . . . . 313  
bell pepper  
 . . . . . 286–287  
 . . . . . 284  
bento box  
 . . . . . 284  
 . . . . . 287  
benzene (⊕) . . . . . 193  
beret, as math-mode accent (̂)  
. . . . . 138  
Berry, Karl . . . . . 390  
beta  
lowercase (β)+ . 20, 22, 24,  
120, 121  
lowercase variant (̢) . . 122  
uppercase (B)+ . . 20, 120  
beth (⌋)+ . . . . . 122, 123  
between (⌋)+ 68–70, 73, 76, 77  
beverage box (📦) . . . . . 284  
Bézier curve (🎨) . . . . . 328–329  
Bible (📖) . . . . . 310  
biconditional  
≡+ . . . . . see equivalence  
↔+ . . . . . see arrow, double  
ended  
bicycle . . . . . 254, 320  
 . . . . . 257  
 . . . . . 320  
 . . . . . 311–312  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 320  
 . . . . . 254  
big O notation . . . . . see also  
alphabets, math, 119  
 . . . . . 119  
 . . . . . 119  
bigints (package) . . 58, 387, 388  
biking . . . . . see cycling  
bikini  
 . . . . . 293  
 . . . . . 281

billed cap () . . . . . 293

billiards () . . . . . 241

billy () . . . . . 206


BIM objects () . . . . . 315–318


binary operators . . . . . 37–52

binary relations . . . . . 68–71, 73–74, 76–91, 115–117


    negated . . . . . 68–70, 72–76, 78


binoculars


 . . . . . 323–325


 . . . . . 325–327

biohazard


 . . . . . 284

 . . . . . 176


 . . . . . 319

 . . . . . 293

biological symbols . . . . . 176


biology () . . . . . 275


bioRxiv


 . . . . . 330–331


Rx . . . . . 330–331


bird


 . . . . . 264–267


 . . . . . 264–267


 . . . . . 264–267


 . . . . . 264–267


 . . . . . 264–267


 . . . . . 264–267


 . . . . . 343–346


 . . . . . 343–346


 . . . . . 202


 . . . . . 202

 . . . . . 202


 . . . . . 202


 . . . . . 201


 . . . . . 262

 . . . . . 268


birthday cake


 . . . . . 323–325


 . . . . . 293


 . . . . . 287

birthday hat, as math-mode ac-


    cent () . . . . . 138


bishop () . . . . . 238–240, 361–363


bison () . . . . . 293


Bitbucket () . . . . . 315–318


Bitcoin


 . . . . . 315–318

 . . . . . 32


Bity () . . . . . 315–318


black droplet () . . . . . 258


black folder () . . . . . 312


black rosette () . . . . . 281


black square button

 . . . . . 293

 . . . . . 313

black tie () . . . . . 315–318

BlackBerry ()<sup>+</sup> . . . . . 315–319

blackboard () *see* chalkboard

blackboard bold *see* alphabets, math

blackboard bold letters

A, umlaut (Ä) . . . . . 163

C (C)<sup>+</sup> . . . . . 119, 162

k (k)<sup>+</sup> . . . . . 123, 124

N (N)<sup>+</sup> . . . . . 119

O, umlaut (Ö) . . . . . 163


Q (Q)<sup>+</sup> . . . . . 119

R (R)<sup>+</sup> . . . . . 119


U, umlaut (Ü) . . . . . 163


Z (Z)<sup>+</sup> . . . . . 119


blank (b) . . . . . 34

bleach () . . . . . 257


blender

 . . . . . 288


 . . . . . 323–325


blind () . . . . . 320

block-element symbols . . . . . 276


blog () . . . . . 173–175


Blogger


 . . . . . 315–318

 . . . . . 315–318


blood


 . . . . . 208–210


 . . . . . 297


    letting () . . . . . 208–210

blood type


A () . . . . . 292


AB () . . . . . 292


B () . . . . . 292

O () . . . . . 293


blowfish


 . . . . . 262

 . . . . . 268

blueberries () . . . . . 284


Bluetooth


 . . . . . 315–318


 . . . . . 315–318

bm (package) . . . . . 380


boar


 . . . . . 206


 . . . . . 262


 . . . . . 268


boat . . . . . 254, 320


 . . . . . 200


 . . . . . 325–327


 . . . . . 325–327

 . . . . . 321

 . . . . . 321

 . . . . . 297


 . . . . . 254


 . . . . . 254


body-text symbols . . . . . 18–35


boisik (package) . . . . . 41, 47, 60, 76, 84, 89, 93, 105–107, 122–124, 126, 137, 156, 159, 192, 208, 213, 233, 387, 388


boko letters


B () . . . . . 25


b () . . . . . 25

D () . . . . . 25

d () . . . . . 25


K () . . . . . 25


k () . . . . . 25


bold () . . . . . 173–175


bold symbols . . . . . 380


bomb


 . . . . . 311–312


 . . . . . 257


 . . . . . 323–325


 . . . . . 329


 . . . . . 294


 . . . . . 312


bond, chemical () . . . . . 178


    covalent () . . . . . 178

    covalent, double () . . . . . 178


    covalent, triple () . . . . . 178


    h () . . . . . 177

    ionic () . . . . . 178

    metal () . . . . . 178

bone

 . . . . . 323–325

 . . . . . 294

bong (🍷) . . . . . 323–325

book

📖 . . . . . 321

📖 . . . . . 275

📖 . . . . . 328–329

📖 . . . . . 328–329

📖 . . . . . 328–329

📖 . . . . . 325–327

📖 . . . . . 325–327

📖 . . . . . 343–346

📖 . . . . . 322

📖 . . . . . 300

📖 . . . . . 294

📖 . . . . . 294

📖 . . . . . 314

📖 . . . . . 314

📖 . . . . . 314

📖 . . . . . 313

book reader (📖) . . . . . 328–329

bookmark

📖 . . . . . 173–175

📖 . . . . . 173–175

📖 . . . . . 171–172

📖 . . . . . 294

📖 . . . . . 313

bookmark tabs

📖 . . . . . 294

📖 . . . . . 313

books

📖 . . . . . 294

📖 . . . . . 314

Boolean domain ( $\mathbb{B}$ ) . . . . . *see*  
alphabets, math

Boolean logic gates 170, 357–358

boomerang

🏹 . . . . . 200

🏹 . . . . . 294

boot (👢) . . . . . 304

hiking (👢) . . . . . 301

multiple (👢) . . . . . 281

ski (🏂) . . . . . 241

Bootstrap

📖 . . . . . 315–318

📖 . . . . . 318–319

border . . . . . 198, 338–352

all (📖) . . . . . 173–175

decorative . . . . . 338–352

none (📖) . . . . . 173–175

S (📖) . . . . . 198

style (📖) . . . . . 173–175

Z (📖) . . . . . 198

born (★) . . . . . 253

Bose distribution (ℓ) . . . . . 178

Bosnia (🇸🇦) . . . . . 242

boson (ℓ) . . . . . 177–178

Higgs (ℓ) . . . . . 177

loop

🌀 . . . . . 177

🌀 . . . . . 177

loop, A

🌀 . . . . . 177

🌀 . . . . . 177

loop, V

🌀 . . . . . 177

🌀 . . . . . 177

W ( $W$ ) . . . . . 178

W minus ( $W^-$ ) . . . . . 178

W plus ( $W^+$ ) . . . . . 178

Z ( $Z$ ) . . . . . 178

both true and false (F) . . . . . 125

bottle (🍷) . . . . . 288

baby

👶 . . . . . 287

👶 . . . . . 292

champagne

🍷 . . . . . 284

🍷 . . . . . 287

lotion (🧴) . . . . . 303

prescription (📖) . . . . . 319

sake, with cup

🍷 . . . . . 285

🍷 . . . . . 287

spray (🍷) . . . . . 325–327

wine (🍷) . . . . . 323–325

bottom ( $\perp$ )<sup>+</sup> . . . . . *see* turnstile, up

bouncing ball (🏀)<sup>+</sup> 294, 302, 304

bouquet

🌸 . . . . . 257

🌸 . . . . . 294

🌸 . . . . . 313

🌸 . . . . . 290

bow

🏹 . . . . . 200

ω . . . . . 201

bow and arrow

🏹 . . . . . 294

🏹 . . . . . 241

bow tie

🎗<sup>+</sup> . . . . . 41, 77

🎗<sup>+</sup> . . . . . 41, 77

🎗<sup>+</sup> . . . . . 42, 78

🎗<sup>+</sup> . . . . . 39–41, 67, 73, 77, 253

🎗<sup>+</sup> . . . . . 40, 41

bowling (🎳)<sup>+</sup> 289, 294, 302, 304

bowl (🍽) . . . . . 288

of hygieia (🍽) . . . . . 313

steaming

🍽 . . . . . 284

🍽 . . . . . 287

with chopsticks (🍽) . . . . . 285

with spoon (🍽) . . . . . 284

bowling

🎳 . . . . . 294

🎳 . . . . . 241

bowling ball (🎳) . . . . . 240

box (📖) . . . . . 323–325

box-drawing symbols . . . . . 276

boxed symbols 38, 45–47, 55–56

backslash (📖)<sup>+</sup> . . . . . 38, 45–47, 55

bar (📖)<sup>+</sup> . . . . . 38, 45–47

bottom (📖)<sup>+</sup> . . . . . 45, 47, 55

box (📖)<sup>+</sup> . . . . . 38, 45–47

circle (📖)<sup>+</sup> . . . . . 38, 45, 47, 55

division (📖)<sup>+</sup> . . . . . 45, 47, 56

dot (📖)<sup>+</sup> . . . . . 38, 45–47, 56

empty (📖)<sup>+</sup> . . . . . 38, 45, 55

left (📖)<sup>+</sup> . . . . . 45, 47, 56

minus (📖)<sup>+</sup> . . . . . 38, 45–47, 56

plus (📖)<sup>+</sup> . . . . . 38, 45–47, 56, 173–175

right (📖)<sup>+</sup> . . . . . 45, 47, 56

slash (📖)<sup>+</sup> . . . . . 38, 45–47, 55

times (📖)<sup>+</sup> . . . . . 38, 45–47, 55

top (📖)<sup>+</sup> . . . . . 45, 47, 55

triangle (📖)<sup>+</sup> . . . . . 45, 47, 55

boxing glove (🥊) . . . . . 294

boy

👦 . . . . . 294

👦 . . . . . 307

bra ((=))<sup>+</sup> . . . . . 127, 171

bra-ket ((=)) . . . . . 171

brace (📖) . . . . . 208–210

braces . . . . . *see* delimiters, 18, 19, 127–131, 366, 382

asymmetric . . . . . 144

decorative . . . . . 199

extensible . . . . . 139–141, 144, 171

multiline . . . . . 144

brackets . . . . . *see* delimiters

blackboard bold (⌈ ⌋) . . . . . 163





































braille (⠠⠠) . . . . . 320

























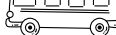

brain




















🧠 . . . . . 319

🧠 . . . . . 294














braket (package) . . . . . 127
























































































brand symbols . . . . . 314–319  
 bread  
 . . . . . 323–325  
 . . . . . 286–287  
 . . . . . 284  
 . . . . . 287  
 breast-feeding () . . . . . 294  
 breve  
 . . . . . 214  
 . . . . . 214  
 . . . . . *see* accents, breve  
 bricks () . . . . . 294  
 bride with veil () . . . . . 307  
 bridge at night  
 . . . . . 294  
 . . . . . 312  
 briefcase  
 . . . . . 323–325  
 . . . . . 322  
 . . . . . 294  
 . . . . . 313  
 briefs () . . . . . 294  
 bright () . . . . . 294  
 broadcast tower () . . . . . 328–329  
 broccoli () . . . . . 284  
 Bronger, Torsten . . . . . 371  
 bronze () . . . . . 206  
 broom . . . . . 117, 149, 150  
 . . . . . 117  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 294  
 bubble tea () . . . . . 284  
 Bucharest . . . . . 246  
 bucket () . . . . . 294  
 . . . . . 325–327  
 Buffer () . . . . . 315–318  
 buffers . . . . . 170, 357–358  
 bug . . . . . *see* insect  
 building  
 . . . . . 208–210  
 . . . . . 323–325  
 Bulgaria () . . . . . 242  
 bulk mail () . . . . . 173–175  
 bull  
 . . . . . 264–267  
 . . . . . 206  
 bull leg () . . . . . 200  
 bullcntr (package) 269, 387, 388


bullenum (package) . . . . . 269  
 bullet (●)<sup>+</sup> . . . . . *see also* circle, square, rhombus, etc., 19, 37, 39, 46, 48, 170, 384  
 as tally markers . . . . . 269  
 hyphen (·) . . . . . 159  
 inverse (◼) . . . . . 159  
 open (○) . . . . . 34  
 square (■) . . . . . 39  
 bullhorn  
 . . . . . 323–325  
 . . . . . 313  
 . . . . . 313  
 bullseye  
 . . . . . 193  
 . . . . . 328–329  
 . . . . . 23  
 . . . . . 22  
 . . . . . 294  
 bunch bistability () . . . . . 161  
 bunch inclusion (: ) . . . . . 82  
 bunch join (⊔)<sup>+</sup> . . . . . *see* union, square  
 bunch meet (⊓)<sup>+</sup> . . . . . *see* intersection, square  
 bundle () . . . . . 208–210  
 bunny  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 burn () . . . . . 328–329  
 . . . . . 306  
 Büromöbel Experte () 315–318  
 burrito  
 . . . . . 286–287  
 . . . . . 284  
 . . . . . 287  
 bus . . . . . 254, 320  
 . . . . . 320  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 320


 . . . . . 320  
 . . . . . 254  
 . . . . . 254  
 bus stop  
 . . . . . 320  
 . . . . . 254  
 business card () . . . . . 322  
 bust in silhouette  
 . . . . . 294  
 . . . . . 307  
 multiple  
 . . . . . 294  
 . . . . . 307  
 butter () . . . . . 284  
 butterfly  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 343–346  
 . . . . . 262  
 Buy n Large () . . . . . 315–318  
 BuySellAds () . . . . . 315–318


C


c  
 stretched  
 . . . . . 22  
 . . . . . 23  
 C++ () . . . . . 318–319  
 C# () . . . . . 318–319  
 cabbage () . . . . . 286–287  
 cactus  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 294  
 . . . . . 281  
 caduceus () . . . . . 275  
 caesura ( / ) . . . . . 214  
 calculator  
 . . . . . 323–325  
 . . . . . 322  
 calendar . . . . . 261


-  . . . . . 261
-  . . . . . 261
-  . . . . . 261
-  . . . . . 261
-  . . . . . 261
-  . . . . . 300
-  . . . . . 299
-  . . . . . 313
-  . . . . . 313
-  . . . . . 313
- marked day () . . . . . 261
- marked week () . . . . . 261
- with check ()<sup>+</sup> . . . . . 261
- with minus ()<sup>+</sup> . . . . . 261
- with plus ()<sup>+</sup> . . . . . 261
- with times ()<sup>+</sup> . . . . . 261
- calf () . . . . . 264–267
- calligra (package) . 163, 387, 388
- Calligra (font) . . . . . 163
- callouts . . . . . 312–314
- calrsfs (package) . . . . . 162
- camel
  - bactrian ()<sup>+</sup> . . . 263, 268
  - dromedary ()<sup>+</sup> . 262, 268
- camera
  -  . . . . . 323–325
  -  . . . . . 322
  -  . . . . . 294
  -  . . . . . 294
  -  . . . . . 312
  -  . . . . . 312
- campground () . . . 328–329
- camping
  -  . . . . . 294
  -  . . . . . 313
- cancel (package) . . . . . 139
- cancel
  -  . . . . . 171–172
  -  . . . . . 171–172
- Cancer ()<sup>+</sup> . . . 166–168, 294, 335–338
- candle
  -  . . . . . 290
  -  . . . . . 325–327
  -  . . . . . 294
  -  . . . . . 314
- candy
  -  . . . . . 286–287
  -  . . . . . 284
  -  . . . . . 287
- candy cane () . . . . . 323–325
- cannabis () . . . . . 323–325
- canned food () . . . . . 284
- canoe
  -  . . . . . 320
  -  . . . . . 254
- cap
  - $\cap$ <sup>+</sup> . . . . . *see* intersection
  -  . . . . . 325–327
- Capricorn . . . . . 335–338
  - . . . . . 166
  - $\text{♄}$  . . . . . 168
  - $\text{♅}$  . . . . . 168
  - . . . . . 166
  -  . . . . . 294
  -  . . . . . 167
- captive () . . . . . 200
- car . . . . . *see* automobile
- card file box
  -  . . . . . 294
  -  . . . . . 313
- card index
  -  . . . . . 294
  -  . . . . . 313
- card index dividers
  -  . . . . . 294
  -  . . . . . 313
- card suits *see* playing card suits
- cardinality ( $\aleph$ )<sup>+</sup> . . . *see* aleph
- care of ( $\text{c/o}$ ) . . . . . 160
- caret
  - $\wedge$  . . . . . 37
  - $\grave{\wedge}$  . . *see* accents, circumflex
  - $\hat{\wedge}$  . . *see* diacritics, circumflex
  - insertion ( $\wedge$ ) . . . . . 159
- Carlisle, David . . . . . 1, 386
- caron ( $\text{̃}$ )<sup>+</sup> . . *see* accents, caron
- carp streamer
  -  . . . . . 294
  -  . . . . . 313
- carpentry plane ( $\text{V}$ ) . . . . . 200
- carpentry saw () . . . . . 295
- carriage return . 105–111, 169, 170, 198, 367, 368
  - $\leftarrow$  . . . . . 105
  - $\ulcorner$  . . . . . 107
  - $\curvearrowright$  . . . . . 109
  - $\rhd$  . . . . . 198
- carrot
  -  . . . . . 323–325
  -  . . . . . 286–287
-  . . . . . 286–287
-  . . . . . 284
- Cartesian product ( $\times$ )<sup>+</sup> . . . *see* times
- cartwheeling ( $\text{Y}$ )<sup>+</sup> 294, 302, 304
- cash register () . . . . . 323–325
- Cassandra () . . . . . 318–319
- castle . . . . . 238, 239, 361–363
  -  . . . . . 240
  -  . . . . . 302
  -  . . . . . 295
  -  . . . . . 312
  -  . . . . . 312
- cat
  -  . . . . . 200
  -  . . . . . 263
  -  . . . . . 264–267
  -  . . . . . 262
  -  . . . . . 268
  - black () . . . . . 262
  - crying ()<sup>+</sup> . . . . . 289, 296
  - grinning () . . . . . 300
  - grinning, with smiling eyes ()<sup>+</sup> . . . . . 289, 300
  - kissing () . . . . . 303
  - kissing, with closed eyes () . . . . . 289
  - pouting ()<sup>+</sup> . . . . . 289, 296
  - Schrodinger’s () . . . 288
  - smiling, with heart-shaped eyes ()<sup>+</sup> . . . . . 289, 298
  - smiling, with open mouth () . . . . . 289
  - weary ()<sup>+</sup> . . . . . 289, 301
- catalexia ( $\wedge$ )<sup>+</sup> . . . . . 271
- catamorphism . . *see* delimiters
- caterpillar () . . . 264–267
- cauldron ( $\text{A}$ )<sup>+</sup> . . . . . 206
- caution . . . . . *see* warning
- ccicons (package) . 34, 387, 388
- cclicenses (package) 34, 387, 388
- CE mark ( $\text{C€}$ ) . . . . . 176
- cedi ( $\text{C}$ ) . . . . . 31
- cedilla ( $\text{̣}$ )<sup>+</sup> *see* accents, cedilla
- celestial bodies . 166–168, 278, 279, 335–338
- cell phone
  -  . . . . . 171
  -  . . . . . 321
  -  . . . . . 323–325


 ..... 325–327


 ..... 329


 ..... 329

 ..... 322


 ..... 292


 ..... 312

 ..... 312–314


multiple () ..... 329


off

 ..... 292

 ..... 312

with arrow

 ..... 292

 ..... 312

celsius (°C) . 154, 164, 165, 385

Celtic knots ..... 348–352


cent

¢ ..... 32

¢ ..... 31, 383


¢ ..... 31

math mode (¢) ..... 123


Centercode () ..... 315–318


centernot (package) ..... 370


centigrade (°C) ..... *see* celsius


centipede () ..... 264–267

CentOS


 ..... 315–318


 ..... 318–319


Ceres () ..... 168, 335–338

certificate () ..... 328–329


CEUR


 ..... 330–331


 ..... 330–331


chains () ..... 295


chair


 ..... 290


 ..... 323–325


 ..... 325–327


 ..... 325–327


 ..... 325–327

 ..... 325–327

 ..... 325–327


 ..... 295


chalkboard () ..... 323–325

with teacher () 328–329


chancery (package) ..... 387


\char .. 17, 367, 368, 378, 382, 385, 386


charging station () . 328–329


chariot () ..... 206

chart


decreasing () ..... 295


increasing () ..... 295

increasing with yen () 295


with downwards trend ()

..... 313


with upwards trend () 313


with upwards trend and yen sign () ..... 313

Charter (font) ..... 32, 65


chassis () ..... 206


check (financial)


 ..... 324


 ..... 324

check box


checked ()+ ... 187, 188


checked, blue () ... 295


checked, circular () . 188


checked, circular, filled ()


..... 188

checked, filled () ... 188


checked, green () ... 295


crossed ()+ ... 187, 188


crossed, circular () . 188


crossed, circular, filled ()


..... 188


crossed, green () ... 296

empty () ..... 187, 188


check mark ()+ 20, 158–160, 187, 188, 198, 253, 295, 365


double () ..... 188


hollow ()+ ..... 188

check out () ..... 173–175

cheese


 ..... 323–325

 ..... 286–287

 ..... 284


chemarr (package) 146, 387, 388


chemarrow (package) . 111, 146, 387


chemistry () ..... 275

Chen, Raymond ..... 390


cherries


 ..... 284

 ..... 287


cherry () ..... 286–287


cherry blossom


 ..... 295


 ..... 281


chess 238–240, 290–305, 361–363


bishop ()+ ..... 238–240

 .. 239


black square () .. 239


board () ..... 240


king ()+ ..... 238–240


knight ()+ ..... 238–240, 361–363

notation ..... 239


pawn ()+ . 238–240, 295, 361–363

pieces () ..... 240

queen ()+ ..... 238–240

rook ()+ ..... 238–240, 361–363

white square ( ) .. 239

chestnut ()+ ..... 295, 312


chevrons ..... 256


chi


lowercase (χ)+ . 20, 22, 24, 120, 121


uppercase (X)+ .. 20, 120


chick


 ..... 264–267

 ..... 262


 ..... 262


 ..... 268


 ..... 268


multiple () 264–267

chicken


 ..... 264–267


 ..... 262


 ..... 268


roasted () 286–287

thigh


 ..... 285


 ..... 286–287


 ..... 287

 ..... 323–325


child


 ..... 200

 ..... 323–325
































 ..... 295

children crossing

 ..... 295

 ..... 254

China2e (package) . 32, 119, 162, 163, 278, 279, 281, 387, 388

- chipmunk  
 ..... 262  
 ..... 268  
Chiron () ..... 168  
chocolate bar  
 ..... 284  
 ..... 287  
choice ( $\tau$ )<sup>+</sup> ..... 161  
chop () ..... 208–210  
chopsticks () ..... 284  
Chrome () ..... 315–318  
Chromecast () ..... 315–318  
chron () ..... 208–210  
Chronos () ..... 168  
chrysanthemum () . 325–327  
church  
 ..... 310  
 ..... 295  
CIENCIAVITAE  
 ..... 330–331  
 ..... 330–331  
cigarette  
 ..... 321  
 ..... 295  
cinema  
 ..... 295  
 ..... 313  
cipher symbols ..... 278  
circle ( $\bigcirc$ )<sup>+</sup> ..... 19, 34, 37–40, 45–52, 55, 58, 159–160, 168, 170, 192–198, 240, 282, 333–334, 339–340, 358–359  
arrow  
 $\leftarrow\bigcirc$  ..... 95  
 $\bigcirc\rightarrow$  ..... 95  
black ( $\bullet$ ) ..... 293  
blue ( $\bullet$ ) ..... 294  
brown ( $\bullet$ ) ..... 294  
concentric ( $\odot$ ) ..... 255  
containing filled circle ( $\odot$ )<sup>+</sup> ..... 50–52  
crossed ( $\otimes$ ) ..... 196  
dotted ( $\odot$ )<sup>+</sup> .. 50, 51, 196  
enclosing  
 ..... 26, 373  
 ..... 193  
 ..... 217  
equals ( $\ominus$ ) ..... 194  
error bars ( $\odot$ ) ..... 193  
fifths ( $\otimes$ ) ..... 68  
filled ( $\bullet$ )<sup>+</sup> ... 46–50, 52, 192–196  
filled, arrow ( $\bullet$ ) ..... 193  
filled, error bars ( $\bullet$ ) .. 193  
filled, half ( $\bullet$ )<sup>+</sup> . 192, 193, 195  
filled, quarter ( $\blacktriangle$ ) ..... 255  
green ( $\bullet$ ) ..... 300  
half  
 $\bigcirc$  .....  $\tau$ <sup>+</sup> ..... 192  
 $\bigcirc$  ..... 192  
half filled  
<sup>+</sup> ..... 192, 193, 196  
<sup>+</sup> ..... 192, 193, 196  
<sup>+</sup> ..... 193, 196  
<sup>+</sup> ..... 193, 196  
hollow red ( $\bigcirc$ ) ..... 301  
horizontally divided ( $\ominus$ )<sup>+</sup> . . . 48, 51, 52, 196, 370  
of dots ( $\odot$ ) ..... 194  
orange ( $\bullet$ ) ..... 294  
outlined ( $\bigcirc$ )<sup>+</sup> ..... 48, 49  
purple ( $\bullet$ ) ..... 296  
quarter filled ( $\bullet$ ) ..... 194  
quarter marked  
 $\bigcirc$  ..... 193  
 $\bigcirc$  ..... 193  
 $\bigcirc$  ..... 194  
 $\bigcirc$  ..... 194  
quartered ( $\oplus$ )<sup>+</sup> .. 49, 196  
red ( $\bullet$ ) ..... 296  
shadowed ( $\bigcirc$ )<sup>+</sup> . 195, 199, 313  
striped  
<sup>+</sup> ..... 194, 196  
 ..... 196  
three quarters filled ( $\bullet$ ) 193  
vertically divided ( $\oplus$ )<sup>+</sup> 50, 196  
white ( $\bullet$ ) ..... 302  
white on black ( $\blacksquare$ )<sup>+</sup> . 170, 193  
white on black, half  
 ..... 193  
 ..... 193  
with small circle ( $\bigcirc$ ) . 194  
yellow ( $\bullet$ ) ..... 304  
circled symbols  
A ( $\text{\textcircled{A}}$ ) ..... 257  
asterisk ( $\text{\textcircled{*}}$ )<sup>+</sup> ... 37, 38, 45–47, 55–56, 59, 60  
backslash ( $\text{\textcircled{/}}$ )<sup>+</sup> ... 38, 39, 45–47, 55, 59  
bar ( $\text{\textcircled{|}}$ )<sup>+</sup> ..... 39, 46, 48  
bottom ( $\text{\textcircled{\text{b}}}$ )<sup>+</sup> 44, 45, 47, 56  
bullet ( $\text{\textcircled{\bullet}}$ ) ..... 193  
circle ( $\text{\textcircled{\circ}}$ )<sup>+</sup> 38, 45–47, 56, 59  
dash ( $\text{\textcircled{-}}$ )<sup>+</sup> ..... 38, 45–47  
division ( $\text{\textcircled{\div}}$ )<sup>+</sup> . 37, 45, 47, 56  
dot ( $\text{\textcircled{\cdot}}$ )<sup>+</sup> 37, 38, 45–47, 54, 59–61  
dot, slash, dot ( $\text{\textcircled{\cdot/}}$ ) . . . 47  
dot, with left arrow ( $\text{\textcircled{\leftarrow}}$ ) 95  
dot, with right arrow ( $\text{\textcircled{\rightarrow}}$ ) ..... 95  
equal ( $\text{\textcircled{=}}$ )<sup>+</sup> . 46, 47, 76, 91  
greater than ( $\text{\textcircled{>}}$ )<sup>+</sup> 38, 47, 69, 91  
greater than or equal ( $\text{\textcircled{\ge}}$ ) ..... 91  
information ( $\text{\textcircled{i}}$ ) ..... 254  
inverted negation ( $\text{\textcircled{\neg}}$ ) 44  
left ( $\text{\textcircled{\leftarrow}}$ )<sup>+</sup> ..... 45, 47, 56  
less than ( $\text{\textcircled{<}}$ )<sup>+</sup> . 38, 47, 48, 69, 91  
less than or equal ( $\text{\textcircled{\le}}$ ) 91  
logical negation ( $\text{\textcircled{\neg}}$ ) . 44  
M ( $\text{\textcircled{M}}$ ) ..... 295  
minus ( $\text{\textcircled{-}}$ )<sup>+</sup> 37, 38, 45–48, 56, 58  
minus or plus ( $\text{\textcircled{\pm}}$ ) . . . 37  
multiplication ( $\text{\textcircled{\times}}$ )<sup>+</sup> .. 37, 38, 45–48, 50, 54, 58, 60, 61, 161  
multiplication, double circled ( $\text{\textcircled{\textcircled{\times}}}$ ) ..... 47  
multiplication, with hat ( $\text{\textcircled{\hat{\times}}}$ ) ..... 47  
numerals 188, 189, 240, 361  
parallel ( $\text{\textcircled{\parallel}}$ ) ..... 48  
perpendicular ( $\text{\textcircled{\perp}}$ ) . . . 48  
plus ( $\text{\textcircled{+}}$ )<sup>+</sup> ..... 36–38, 45–47, 54, 58, 60, 61, 161, 173–175, 367  
plus or minus ( $\text{\textcircled{\pm}}$ ) . . . 37  
pomme cross ( $\text{\textcircled{\times}}$ ) . . . 313  
question mark ( $\text{\textcircled{?}}$ )<sup>+</sup> . 173–175  
R ( $\text{\textcircled{R}}$ )<sup>+</sup> ..... 20, 123, 124  
right ( $\text{\textcircled{\rightarrow}}$ )<sup>+</sup> ..... 45, 47, 55  
right dot ( $\text{\textcircled{\cdot}}$ ) ..... 193  
right dot, inverse ( $\text{\textcircled{\cdot}}$ ) . 193  
S ( $\text{\textcircled{S}}$ )<sup>+</sup> ..... 123, 124  
similar or equal to ( $\text{\textcircled{\approx}}$ ) 91  
slash ( $\text{\textcircled{/}}$ )<sup>+</sup> . 37, 38, 45–47, 49–51, 55, 58  
square ( $\text{\textcircled{\square}}$ ) ..... 240  
star ( $\text{\textcircled{\star}}$ )<sup>+</sup> 45, 58, 161, 189, 190, 193






- ♣ ..... 299
- ♣ ..... 281
- clown (🤡) ..... 295
- club
  - ♣ . *see* playing card suits,
  - club
  - ♣ ..... 200
- clutch bag (👜) ..... 295
- cmll (package) .. 37, 44, 67, 81, 125, 387
- cmupint (package) . 64, 65, 387, 388
- coach (🚌) ..... 325–327
- coat
  - 🧥 ..... 343–346
  - 🧥 ..... 295
- cobra (🐍) ..... 264–267
- cockroach (🪳) ..... 262
- cocktail
  - 🍸 ..... 323–325
  - 🍸 ..... 285
  - 🍸 ..... 287
- coconut (🥥) ..... 285
- coda
  - 🎵 ..... 214
  - 🎵 ..... 214
- code
  - 🔗 ..... 173–175
  - 🔗 ..... 173–175
  - 🔗 ..... 171–172
  - 🔗 ..... 171–172
- code branch (🔗) ..... 173–175
- code page 1252 ..... 384
- table ..... 384
- code page 437 ... 170, 276, 382
- CodeIgniter (🔗) ..... 318–319
- CodePen
  - 🔗 ..... 315–318
  - 🔗 ..... 318–319
- CodiePie (🔗) ..... 315–318
- Coffee Bean (🔗) ..... 318–319
- coffin (🪦) ..... 295
- cog ..... *see* gear
- coherence (☺)<sup>+</sup> . *see* smiles and frowns, both
- coin (🪙) ..... 295
- multiple (🪙)<sup>+</sup> 32, 323–325
- collision
  - 💥 ..... 296
  - 💥 ..... 313
- colon (:)<sup>+</sup> ..... 151–153
- approximately equal to (≈)<sup>+</sup> ..... 69, 79, 81
- double (::)<sup>+</sup> .. 79, 81, 152
- double, approximately equal to (≈)<sup>+</sup> ..... 69, 79, 81
- double, equals (:=)<sup>+</sup> 69, 77, 79, 81
- double, minus (:-)<sup>+</sup> 69, 79, 81
- double, similar to (::~)<sup>+</sup> 69, 79, 81
- equals (:=)<sup>+</sup> 36, 69, 70, 73, 74, 77, 79, 81, 125
- four dot (⋮) ..... 153
- hollow (⊘) ..... 42
- math mode (:)<sup>+</sup> . 81, 152, 153
- minus (:-)<sup>+</sup> ... 69, 79, 81
- similar to (::~)<sup>+</sup> 69, 79, 81
- three dot (⋮)<sup>+</sup> ... 42, 153
- vertically centered (:)<sup>+</sup> . 79
- colonequals (package) .. 36, 81, 387, 388
- column (📄) ..... 200
- columns (📄) ..... 173–175
- comb
  - 🔗 ..... 200
  - 🔗 ..... 325–327
- combelow (package) 30, 387, 388
- combinatorial logic gates . 170, 357–358
- comet (🚀) ..... 296, 335–338
- comma (,) ..... 37
- sans serif (,) ..... 154
- comment
  - 🗨️ ..... 173–175
  - 🗨️ ..... 173–175
  - 🗨️ ..... 173–175
  - 🗨️ ..... 173–175
- comment with dollar (\$) . 173–175
- comment with ellipsis
  - 🗨️ ..... 173–175
  - 🗨️ ..... 173–175
- comments
  - 🗨️ ..... 173–175
  - 🗨️ ..... 173–175
- comments off (🚫) ... 173–175
- comments with dollar (\$) 173–175
- commerce (🏪) ..... 275
- commercial logos ..... 314–319
- common time (C)<sup>+</sup> .. 216, 219
- forward and reversed (C) ..... 214
- communication symbols ... 171
- communism (🔨) . *see* hammer, and sickle
- commutative diagrams .... 372
- comp.text.tex (newsgroup) 17, 36, 38, 368–372, 374
- compact disc
  - 📀 ..... 323–325
  - 📀 ..... 294
  - 📀 ..... 313
  - 📀 ..... 312
- compass ..... 333–334
- 📐 ..... 311–312
- 📐 ..... 323–325
- 📐 ..... 322
- 📐 ..... 296
- drawing (🔗) ..... 275
- complement (C)<sup>+</sup> .. 55, 58, 123, 124
- complex numbers (C) ..... *see* alphabets, math
- composited accents ..... 26
- Comprehensive T<sub>E</sub>X Archive Network 1, 16, 139, 163, 170, 364, 384, 385, 387
- compress
  - 🔗 ..... 173–175
  - 🔗 ..... 173–175
  - 🔗 ..... 173–175
- compression (🔗) ..... 313
- computer
  - 🖥️ ..... 323–325
  - 🖥️ ..... 325–327
  - 🖥️ ..... 322
  - 🖥️ ..... 322
  - 🖥️ ..... 296
  - 🖥️ ..... 297
  - 🖥️ ..... 313
  - 🖥️ ..... 312
  - 🖥️ ..... 312
  - multiple, networked (🖥️) .. ..... 312
- computer disk (📀) ..... 296
- computer hardware symbols 169, 290–305, 312–314
- computer keys ... *see* keyboard symbols
- Computer Modern (font) . 112, 360, 366, 382

Computer Modern Sans (font) . . . . . 360



concatenation  
 # . . . . . 161  
 || . . . . . 161


conclusion ( $\Rightarrow$ ) . . . . . 154

condiments () . . . . . 286–287

conductivity ( $\otimes$ ) . . . . . 178

cone ( $\triangleright$ ) . . . . . 255


confetti ball  
 . . . . . 296  
 . . . . . 312



Confluence () . . . . . 315–318


congruent ( $\cong$ ) . . . *see similar, or equal to*



conic taper ( $\triangleright$ ) *see triangle, bar through*



conjunction  
 astronomical ( $\sigma$ )<sup>+</sup> 166–168, 335–338  
 logical ( $\wedge$ ) . . . . . *see wedge*



Connect Develop () 315–318


consequence relation . . . . . 79–80  
<sup>+</sup> . . . . . 79, 80  
 . . . . . 81  
 denied ( $\nVdash$ ) . . . . . 81

constellation () . . . . . 279

construction  
 . . . . . 294  
 . . . . . 313

construction sign  
 . . . . . 320  
 . . . . . 254



construction worker  
<sup>+</sup> . . . . . 296, 302, 304  
 . . . . . 307



Contao () . . . . . 315–318



contingency ( $\blacktriangledown$ ) . . . . . 50  
 deontic ( $\triangledown$ ) . . . . . 50  
 doxastic ( $\nabla$ ) . . . . . 51  
 factual ( $\triangledown$ ) . . . . . 51  
 logical ( $\nabla$ ) . . . . . 52  
 temporal ( $\triangledown$ ) . . . . . 49

contradiction symbols . . . . . 36, 118

control characters . . . . . 170

control knobs  
 . . . . . 296  
 . . . . . 313


convenience store  
 . . . . . 296  
 . . . . . 314


Conversation  
 . . . . . 330–331  
 . . . . . 330–331




converse implication  
 $\leftarrow$ <sup>+</sup> . . . . . *see arrow*  
 $\subset$ <sup>+</sup> . . . . . *see subset, strict*



converse nonimplication  
 $\leftarrow$ <sup>+</sup> . . . . . *see arrow*  
 $\not\subset$ <sup>+</sup> . . . . . *see subset, strict, negated*

convolution ( $\ast$ )<sup>+</sup> . . . . . 39, 42

cook ()<sup>+</sup> . . . . . 296, 302, 304


cooker () . . . . . 288

cookie  
 . . . . . 323–325  
 . . . . . 285  
 . . . . . 287

cooking  
 . . . . . 285  
 . . . . . 287

cooking symbols . . . . . 286–288



cooking symbols (package) . . . . . 287, 387, 388

COOL () . . . . . 296

axes ( $\searrow$ ) . . . . . 156



coppa  
 lowercase ( $\wp$ ) . . . . . 208  
 lowercase variant ( $\wp$ ) . . . . . 208  
 uppercase ( $\Psi$ ) . . . . . 208

coproduct ( $\amalg$ )<sup>+</sup> 36, 37, 39–42, 54, 58–61

copy  
 . . . . . 173–175  
 . . . . . 173–175

copyleft ( $\text{\textcircled{C}}$ ) *see legal symbols, copyleft*

copyright ( $\text{\textcircled{C}}$ )<sup>+</sup> . . . . . *see legal symbols, copyright*

corn  
 . . . . . 297  
 . . . . . 281


corner  
 $\llcorner$ <sup>+</sup> . . . . . 170, 240  
 $\lrcorner$ <sup>+</sup> . . . . . 23, 240  
 $\llcorner$  . . . . . 240  
 $\lrcorner$ <sup>+</sup> . . . . . 22, 240  
 $\lrcorner$  . . . . . 201  
 $\llcorner$  . . . . . 201



both top and bottom  
 $\lrcorner$ <sup>+</sup> . . . . . 129, 130  
 $\llcorner$ <sup>+</sup> . . . . . 129, 130

corporate logos . . . . . 314–319

corresponds ( $\cong$ )<sup>+</sup> . . . . . 69, 76, 154

cotton bureau ( $\text{\textcircled{C}}$ ) . . . . . 315–318




couch () . . . . . 323–325

couch and lamp  
 . . . . . 296  
 . . . . . 254



counties  
 Romanian . . . . . 245–246

countries  
 European . . . . . 242–244







countriesofeuropa (package) 242, 387, 388


couple with heart  
 . . . . . 296  
 . . . . . 296  
 . . . . . 290

Courier (font) . . . . . 32

Coursera  
 . . . . . 330–331  
 . . . . . 330–331


cover ( $\leftarrow$ ) . . . . . 161





cow  
 . . . . . 264–267  
 . . . . . 343–346  
 $\nwarrow$ <sup>+</sup> . . . . . 206  
 . . . . . 262  
 . . . . . 262  
 . . . . . 268  
 . . . . . 268


cowboy hat, as math-mode accent  
 . . . . . 138



CP1252 . . . . . *see code page 1252*

CP437 . . . . . *see code page 437*





cPanel () . . . . . 315–318




























































crab  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 343–346  
 . . . . . 262
































































crane () . . . . . 325–327


























crayon  
 . . . . . 296  
 . . . . . 184

Creative Commons licenses 33, 34

credit card  
 . . . . . 323–325  
 . . . . . 322  
 . . . . . 296  
 . . . . . 313


- credit cards . 290–305, 315–318, 322–325  
 Amazon Pay () 315–318  
 American Express () 315–318  
 Apple Pay () . 315–318  
 Diners Club () 315–318  
 Discover () . . . . . 315–318  
 JCB () . . . . . 315–318  
 Mastercard () . 315–318  
 PayPal () . . . . . 315–318  
 Stripe () . . . . . 315–318  
 Visa () . . . . . 315–318
- crescendo () . . . . . 220
- cricket () . . . . . 262
- cricket bat and ball  
 . . . . . 296  
 . . . . . 241
- Critical Role () . . . . . 315–318
- Croatia (€) . . . . . 242
- crocodile  
 . . . . . 262  
 . . . . . 268
- croissant () . . . . . 285
- crop  
 . . . . . 173–175  
 . . . . . 173–175
- cross (crucifix) 47–48, 186, 187, 198, 225–230, 240, 257, 274, 310, 327, 333–334, 365  
 † . . . . . 257  
 † . . . . . 135  
 † . . . . . 259  
 † . . . . . 135  
 † . . . . . 186  
 † . . . . . 310  
 † . . . . . 303  
 † . . . . . 187  
 † . . . . . 187  
 Celtic (†)<sup>+</sup> . . . . . 187, 257  
 clover tipped (†) . . . . . 186  
 Eastern (†) . . . . . 187  
 Greek, bold (†) . . . . . 187  
 Greek, outlined (†) . . . . . 187  
 hollow (†) . . . . . 187  
 open center (†) . . . . . 187  
 open center, bold (†) . . . . . 187  
 Orthodox (†) . . . . . 294  
 outlined (†)<sup>+</sup> . . . . . 186, 187  
 outlined, bold (†) . . . . . 186  
 pattée (†)<sup>+</sup> . . . . . 20, 158, 159, 186, 187, 253  
 pommee (†) . . . . . 313
- pommee, with half-circle below (†) . . . . . 313  
 shadowed (†)<sup>+</sup> . . . . . 186, 187  
 Western (†) . . . . . 187
- cross mark . 159–160, 187, 188  
 \* . . . . . 211  
 × . . . . . 194  
 × . . . . . 187  
 × . . . . . 187  
 ×<sup>+</sup> . . . . . 187, 194, 195  
 × . . . . . 313  
 × . . . . . 188  
 × . . . . . 199  
 double (×) . . . . . 211  
 red (×) . . . . . 296  
 triple (×) . . . . . 211  
 white on black (×) . . . . . 199
- cross product (×)<sup>+</sup> . *see* times
- crossed letters *see* barred letters
- crosshairs (†) . . . . . 173–175
- crossing  
 diagonal  
 † . . . . . 71  
 † . . . . . 72  
 horizontal (×)<sup>+</sup> . . . . . 70, 73  
 plus (×) . . . . . 198  
 vertical (×)<sup>+</sup> . . . . . 71, 198
- Crossref  
 . . . . . 330–331  
 . . . . . 330–331
- crow () . . . . . 263
- crown  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 343–346  
 . . . . . 296  
 . . . . . 281  
 as math-mode accent (†) . . . . . 138
- crucifix . . . . . *see* cross (crucifix)
- crutch () . . . . . 319
- cryst (package) . . . . . 358, 387
- crystal ball  
 . . . . . 296  
 . . . . . 313
- crystallography symbols 358–359
- CSS  
 . . . . . 318–319  
 . . . . . 171–172
- CSS3  
 . . . . . 318–319  
 . . . . . 318–319
- CTAN *see* Comprehensive T<sub>E</sub>X Archive Network
- cube  
 . . . . . 311–312  
 . . . . . 328–329  
 . . . . . 255  
 impossible (†) . . . . . 255
- cube root ( $\sqrt[3]{\square}$ ) *see* square root
- cube rotations . . . . . 329
- cubes (†) . . . . . 328–329
- cucumber  
 . . . . . 286–287  
 . . . . . 285
- cup  
 U<sup>+</sup> . . . . . *see* union  
 . . . . . 206
- coffee  
 . . . . . 257, 290  
 . . . . . 322  
 . . . . . 323–325  
 with straw () . . . . . 285
- cupcake  
 . . . . . 286–287  
 . . . . . 286–287  
 . . . . . 286–287  
 . . . . . 286–287  
 . . . . . 285
- Cupid () . . . . . 168
- curling stone () . . . . . 296
- curly pi (π)<sup>+</sup> *see* pi, lowercase variant
- currency (¤)<sup>+</sup> . . . . . 31, 32, 383
- currency exchange  
 . . . . . 296  
 . . . . . 313
- currency symbols . . . . . 31–33, 37, 159–160, 163, 290–305, 312–318  
 ancient . . . . . 32
- curry  
 . . . . . 285  
 . . . . . 287
- cushion () . . . . . 325–327
- custard  
 . . . . . 285  
 . . . . . 287


- customs  
 ..... 320  
 ..... 254
- cut time () .. *see* alla breve  
 cutoff subtraction ( $\pm$ )<sup>+</sup> ... *see* minus, dot
- cutting board () 286–287  
 Cuttlefish () ..... 315–318  
 CV  
 ..... 330–331  
 ..... 330–331
- cycling  
 ..... 307  
 ..... 240  
 ..... 321  
 ..... 321  
 ..... 320  
 ..... 321  
 ..... 321  
 ..... 320  
 ..... 254  
 ..... 254
- cyclone  
 ..... 296  
 ..... 312
- Cypriot ..... 207  
 cypriot (package) . 207, 387, 388  
 Czechia () ..... 242
- D**
- d'Alembert operator  
 ..... 159  
 ..... 159  
 D3 () ..... 318–319  
 dagger  
 ..... 19, 37, 42, 43, 384  
 ..... 296  
 ..... 313  
 double horizontal ( $\dagger$ ) . 37  
 double horizontal and vertical ( $\ddagger$ ) ..... 37  
 double vertical ( $\ddagger$ )<sup>+</sup> 19, 37, 42, 43, 384  
 Dailymotion () ..... 315–318  
 dal segno ( $\$$ )<sup>+</sup> ..... *see* segno  
 dales ( $\daleth$ )<sup>+</sup> ..... 122, 123  
 dancer () ..... 307  
 dancers (package) ..... 352, 387  
 dancing ()<sup>+</sup> ... 302, 304, 314  
 dancing men ..... 352–355  
 D&D () ..... 315–318  
 D&D Beyond () ... 315–318  
 danger ..... *see* warning
- dangerous bend  
 ..... 159  
 ..... 311–312  
 ..... 255  
 ..... 255  
 ..... 255
- dango  
 ..... 285  
 ..... 287
- Danish runes . *see* normal runes  
 dark skin tone () ..... 296  
 dash (punctuation mark)  
 em ( $\text{—}$ ) ..... 19  
 en ( $\text{‐}$ ) ..... 19  
 three quarters em ( $\text{—}$ ) . 34  
 twelve u ( $\text{—}$ ) ..... 34  
 DashCube () ..... 315–318  
 dashing away  
 ..... 296  
 ..... 313
- Data Cite  
 ..... 330–331  
 ..... 330–331
- database  
 ..... 173–175  
 ..... 329  
 ..... 329  
 ..... 329  
 ..... 171–172
- database join *see* join (database)  
 database symbols 39–41, 67–69, 73–74, 159–160
- Dataverse  
 ..... 330–331  
 ..... 330–331
- date ( <sup>(17)</sup>) ..... 296  
 dbllacnt (package) ..... 373  
 DBLP  
 ..... 330–331  
 ..... 330–331
- deaf () ..... 320  
 deal with () ..... 208–210  
 Debian () ..... 318–319  
 $\backslash\text{DeclareMathOperator}$  ... 380  
 $\backslash\text{DeclareMathOperator}^*$  ... 380  
 decrease font size (**Aa**) ..... 313  
 decrescendo ( $\text{>}$ ) ..... 220  
 Dedekind, Richard ..... 368
- deer  
 ..... 208–210  
 ..... 262  
 Deezer () ..... 315–318  
 definite-description operator ( $\imath$ ) ..... 368  
 definition symbols ..... 36, 374  
 degree ( $\circ$ )<sup>+</sup> . 158, 160, 164, 383  
 del.icio.us () ..... 315–318  
 delatur ..... *see* denarius  
 delete  
 ..... 188  
 ..... 188
- delimiters ..... 126–135  
 angle bracket ( $\langle \! \! \rangle$ ) 36, 127, 129, 130, 132, 134, 135, 382  
 angle bracket with bar ( $\langle \! \! \rangle$ ) ..... 129, 134  
 angle bracket with dot ( $\langle \! \! \rangle$ ) ..... 126, 130  
 arrow brace ( $\langle \! \! \rangle$ ) ... 134  
 bag ( $\langle \! \! \rangle$ ) ..... 41, 126  
 brace with bar ( $\langle \! \! \rangle$ ) . 134  
 bracket with bar ( $\langle \! \! \rangle$ ) 128, 129, 131, 133, 134  
 broken brace with bar ( $\langle \! \! \rangle$ ) ..... 134  
 broken bracket with bar ( $\langle \! \! \rangle$ ) ..... 134  
 ceiling ( $\langle \! \! \rangle$ ) 127, 128, 130, 131, 134  
 circle brace with bar ( $\langle \! \! \rangle$ ) ..... 134  
 circle bracket with bar ( $\langle \! \! \rangle$ ) ..... 134  
 corners ( $\langle \! \! \rangle$ ) ..... 126  
 curly brace ( $\langle \! \! \rangle$ ) 128, 130, 131, 134, 135  
 curly brace with bar ( $\langle \! \! \rangle$ ) ..... 131  
 curly bracket with bar ( $\langle \! \! \rangle$ ) ..... 134  
 curly broken brace ( $\langle \! \! \rangle$ ) 134  
 curly circle brace ( $\langle \! \! \rangle$ ) 134  
 curved angle bracket ( $\langle \! \! \rangle$ ) ..... 126, 134  
 double angle bracket ( $\langle \! \! \rangle$ ) ... 130, 131, 133, 134  
 double bar ( $\langle \! \! \rangle$ ) 127–129, 131, 132  
 double ceiling ( $\langle \! \! \rangle$ ) . 126, 133, 135  
 double curly brace ( $\langle \! \! \rangle$ ) . ..... 135


- double floor ( $\llbracket \blacksquare \rrbracket$ ) . . . 126, 133, 135
- double group brace ( $\llbracket \blacksquare \rrbracket$ ) . . . . . 135
- double parenthesis ( $\langle \blacksquare \rangle$ ) . . . . . 126, 135
- double parenthesis with greater/less than ( $\langle \blacksquare \rangle$ ) . . . . . 126
- double vertical bar ( $\|\blacksquare\|$ ) 128, 130, 133, 134
- double wavy line ( $\} \blacksquare \}$ ) . . . . . 129
- double zigzag ( $\} \blacksquare \}$ ) . . . 126
- floor ( $\lfloor \blacksquare \rfloor$ ) . . . 127, 129, 130, 132, 135
- group brace ( $\llbracket \blacksquare \rrbracket$ ) 127, 129, 130, 132, 135
- lower corners ( $\llcorner \blacksquare \lrcorner$ ) . . . 126, 127, 129, 130
- moustache ( $\int \blacksquare \int$ ) 127, 129, 131, 132
- parenthesis ( $\langle \blacksquare \rangle$ ) 127, 129, 131, 132, 135
- parenthesis with bar ( $\langle \blacksquare \rangle$ ) . . . . . 132, 135, 163
- parenthesis with less/greater than ( $\langle \blacksquare \rangle$ ) . . . . . 126
- quill ( $\{ \blacksquare \}$ ) . . . . . 135
- square bracket ( $\llbracket \blacksquare \rrbracket$ ) . . . 130, 131, 134
- square bracket with bar ( $\llbracket \blacksquare \rrbracket$ ) . . . 130, 131, 133, 135
- square bracket with lower tick ( $\lfloor \blacksquare \rfloor$ ) . . . . . 126
- square bracket with underbar ( $\lfloor \blacksquare \rfloor$ ) . . . . . 126
- square bracket with upper tick ( $\lceil \blacksquare \rceil$ ) . . . . . 126
- square brackets ( $\llbracket \blacksquare \rrbracket$ ) . . . 127, 129, 131, 132
- square broken bracket ( $\{ \blacksquare \}$ ) . . . . . 134
- square circle bracket ( $\langle \blacksquare \rangle$ ) . . . . . 134
- square curly bracket ( $\{ \blacksquare \}$ ) . . . . . 134
- square parenthesis ( $\llbracket \blacksquare \rrbracket$ ) 135
- text-mode . . . . . 135
- tortoise shell ( $\langle \blacksquare \rangle$ ) 131, 135
- tortoise shell with bar ( $\langle \blacksquare \rangle$ ) . . . . . 126, 135
- tortoise shell, filled ( $\langle \blacksquare \rangle$ ) . . . . . 126
- triple angle bracket ( $\langle \langle \langle \blacksquare \rangle \rangle \rangle$ ) . . . . . 133
- triple square bracket ( $\llbracket \blacksquare \rrbracket$ ) . . . . . 133
- triple vertical bar ( $\|\blacksquare\|$ ) 128, 130–133, 135
- turn ( $\dashv \blacksquare \dashv$ ) . . . . . 135
- upper corners ( $\llcorner \blacksquare \lrcorner$ ) . . . 126, 129, 130
- variable-sized . . . . . 127–135
- vertical bar ( $\|\blacksquare\|$ ) . . . 127–132, 134
- wavy line ( $\} \blacksquare \}$ ) . . . 128–132
- zigzag ( $\} \blacksquare \}$ ) . . . . . 126
- delivery truck  . . . . . 320
-  . . . . . 254
- delta
- lowercase ( $\delta$ )<sup>+</sup> 20, 120, 121
- uppercase ( $\Delta$ )<sup>+</sup> . . . 20, 23, 120, 121, 159
- Democrat () . . . . . 328–329
- denarius  . . . . . 32
-  . . . . . 32
- Denmark () . . . . . 243
- department store  . . . . . 297
-  . . . . . 314
- Deploydog () . . . . . 315–318
- Depsy  . . . . . 330–331
-  . . . . . 330–331
- derivative, partial ( $\partial$ )<sup>+</sup> . . . *see* partial derivative
- Descartes’s equal sign ( $\propto$ )<sup>+</sup> *see* proportionality, reversed
- descendant ( $\text{D}^{\text{sc}}$ ) . . . . . 168
- descending node ( $\text{?}$ )<sup>+</sup> 166, 167, 335–338
- desert  . . . . . 297
-  . . . . . 313
- desk light () . . . . . 325–327
- Deskpro () . . . . . 315–318
- desktop  . . . . . 173–175
-  . . . . . 322
- desktop window () . . . . . 313
- detective ()<sup>+</sup> . . . 297, 302, 304
- DEV () . . . . . 315–318
- DeviantArt () . . . . . 315–318
- dharmachakra  . . . . . 310
-  . . . . . 206
-  . . . . . 302
- DHL () . . . . . 315–318
- diacritics . . . . . *see also* accents
- acute ( $\acute{\text{`}}$ )<sup>+</sup> . . . . . 31, 383
- acute, double ( $\text{¨}$ ) . . . . . 31
- apostrophe, reversed ( $\text{’}$ )<sup>+</sup> . . . . . 23, 31
- arrow down ( $\downarrow$ ) . . . . . 23
- arrow up ( $\uparrow$ ) . . . . . 23
- breve ( $\text{˘}$ ) . . . . . 31
- caron ( $\text{ˇ}$ ) . . . . . 31
- Celtic palatal ( $\text{’}$ ) . . . . . 22
- circumflex ( $\text{ˆ}$ )<sup>+</sup> . . . 19, 382
- corner ( $\text{ˆ}$ ) . . . . . 31
- diæresis ( $\text{¨}$ )<sup>+</sup> . . . . . 31, 383
- dots below ( $\text{.}$ ) . . . . . 31
- down bracket, below ( $\text{—}$ ) . . . . . 160
- grave ( $\text{˘}$ ) . . . . . 31
- grave, double ( $\text{¨}$ ) . . . . . 31
- greater than ( $\text{ˆ}$ ) . . . . . 23
- half length ( $\text{ˆ}$ ) . . . . . 31
- half ring, left ( $\text{ˆ}$ ) . . . . . *see* diacritics, open
- half-length vowel ( $\text{ˆ}$ ) . . . 22
- hat ( $\text{ˆ}$ )<sup>+</sup> . . . *see* diacritics, circumflex
- hook ( $\text{ˆ}$ ) . . . . . 22
- hook right ( $\text{ˆ}$ ) . . . . . 22
- hook right, long ( $\text{ˆ}$ ) . . . . . 23
- less than ( $\text{ˆ}$ ) . . . . . 22
- macron ( $\text{ˉ}$ )<sup>+</sup> 31, 382, 383
- open ( $\text{ˆ}$ ) . . . . . 31
- palatal hook
- $\text{ˆ}$  . . . . . 23
- $\text{ˆ}$  . . . . . 24
- $\text{ˆ}$  . . . . . 24
- pointer down ( $\text{ˆ}$ ) . . . . . 31
- pointer left ( $\text{ˆ}$ ) . . . . . 31
- pointer right ( $\text{ˆ}$ ) . . . . . 31
- pointer up ( $\text{ˆ}$ ) . . . . . 31
- Polish hook ( $\text{ˆ}$ ) . . . . . 31
- primary stress ( $\text{ˆ}$ ) . . . . . 23
- rectangle ( $\text{ˆ}$ ) . . . . . 24
- retracting ( $\text{ˆ}$ ) . . . . . 24
- rhoticity ( $\text{ˆ}$ ) . . . . . 23
- ring ( $\text{ˆ}$ ) . . . . . 31
- ring below ( $\text{ˆ}$ ) . . . . . 31
- secondary stress ( $\text{ˆ}$ )<sup>+</sup> 22, 31
- stress ( $\text{ˆ}$ ) . . . . . 31
- syllabic ( $\text{ˆ}$ ) . . . . . 31
- tack down ( $\text{ˆ}$ ) . . . . . 31


- tack left (◌) . . . . . 31  
 tack right (◌) . . . . . 31  
 tack up (◌) . . . . . 31  
 tilde  
   ~ . . . . . 19, 382  
   ˜ . . . . . 19, 382  
 tilde below (◌) . . . . . 31  
 tilde, middle (˘) . . . . . 31  
 up bracket, above (◌) 159  
 wedge below (◌) . . . . . 31  
 diæresis (◌)<sup>+</sup> . . . . . *see* accents,  
   diæresis  
 diagonal line  
   down (◌)<sup>+</sup> . . 71, 157–159  
   down, double (◌) . . . 71  
   down, double, negated (◌) . . . . . 72  
   down, negated (◌)<sup>+</sup> 72, 73  
   two, crossed (×)<sup>+</sup> 159, 160  
   up (◌)<sup>+</sup> . 70, 71, 157–159  
   up, double (◌) . . . . . 70  
   up, double, negated (◌) 72  
   up, negated (◌)<sup>+</sup> . . 72, 73  
 diameter (∅)<sup>+</sup> 36, 158, 159, 253  
   reversed (∅) . . . . . 253  
 diamond (◊)<sup>+</sup> . . . *see* rhombus  
 diamond suit (♠) . . *see* playing  
   card suits, diamond  
 Diaspora (★) . . . . . 315–318  
 dice (package) . . . . . 360, 387  
 dice (◻◻◻◻◻◻)<sup>+</sup> 235, 236, 241,  
   360, 367  
 20-sided (♠) . . . . . 236  
 3D . . . . . 236, 360  
   ◻ . . . . . 236  
   ◻<sup>+</sup> . . . . . 236, 241  
   ♠ . . . . . 299  
   ♠ . . . . . 325–327  
 dictionary symbols . 22–25, 275  
 dictsym (package) 275, 387, 388  
 died (†) . . . . . 253  
 difference between (≠) . . . . . *see*  
   equal, bump  
 differential, inexact (d̄)<sup>+</sup> . . *see*  
   barred letters, d  
 digamma  
   lowercase (ƒ)<sup>+</sup> . 120, 124,  
   208  
   lowercase variant (ƒ) . . 208  
   uppercase (Ƒ)<sup>+</sup> . . . . . 208  
 Digg (digg) . . . . . 315–318  
 digital logic gates 170, 357–358  
 Digital Ocean (🌐) . . . 315–318  
 digital signals  
   falling edge (⌋) . . . . . 164  
   high (⌈)<sup>+</sup> . . . . . 164  
   low (⌋)<sup>+</sup> . . . . . 164  
   rising edge (⌈) . . . . . 164  
 digits . . . . . *see* numerals  
 dim (☀) . . . . . 297  
 Diners Club (🍷) . . . . 315–318  
 \ding . . . . . 21, 179, 182, 184,  
   186–188, 190, 195, 198  
 dingautolist . . . . . 188, 189  
 dingbat (package) 183, 184, 198,  
   342, 365, 387, 388  
 dingbat symbols . . . . 179–199  
 dinosaur  
   🦖 . . . . . 264–267  
   🦕 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 264–267  
   🦖 . . . . . 262  
   🦖 . . . . . 263  
 dipole  
   > . . . . . 271  
   > . . . . . 271  
   > . . . . . 271  
   > . . . . . 271  
 dipole (d<sup>p</sup>) . . . . . 178  
 Dirac notation . . . . . 127, 171  
 direct (D) . . . . . 168  
 directions  
   ↻ . . . . . 328–329  
   ⤴ . . . . . 322  
 disability symbols . . . . . 320  
 Discord (🗨) . . . . . 315–318  
 discount (ℳ) . . . . . *see* minus,  
   commercial  
 Discourse (D) . . . . . 315–318  
 Discover (🌐) . . . . . 315–318  
 discretionary hyphen . . . . . 382  
 dish (©) . . . . . 287  
 disjoint union  
   II . . . . . 36  
   II . . . . . 36  
   ∪ . . . . . 36  
   ⊕ . . . . . 36  
   ⊔ . . . . . 36  
 disjunction, logical (∨) . *see* vee  
 \displaystyle . 371, 372, 374,  
   380  
 ditto marks (")<sup>+</sup> *see* quotation  
   marks, straight double  
 divides  
   ⋮ . . . . . 43  
   |<sup>+</sup> . . . . . *see* vertical bar  
   negated  
   |<sup>+</sup> . . . . . *see* vertical bar,  
   negated  
   / . . . . . 43  
 diving mask (🤿) . . . . . 297  
 division . . . . . 37  
   ÷<sup>+</sup> . . . . . 37, 40–43, 160  
   /+ . . . . . 37, 41, 154  
 diagonal  
   × . . . . . 39  
   × . . . . . 39  
 dingbat (÷)<sup>+</sup> 156, 157, 199,  
   297  
 hollow (⊖) . . . . . 156  
 long (◻)<sup>+</sup> . . . . . 139, 141  
 non-commutative . . . . . 151  
 polynomial . . . . . 139  
 single dot  
   ˘ . . . . . 39  
   ˙ . . . . . 39  
 times (×)<sup>+</sup> . 38, 39, 41–43  
 vertical (÷) . . . . . 40  
 division times (×)<sup>+</sup> *see* division,  
   times  
 divorced (👤) . . . . . 253  
 diya lamp (🏮) . . . . . 297  
 dizzy  
   🌀 . . . . . 297  
   🌀 . . . . . 313  
 DNA  
   🧬 . . . . . 319  
   🧬 . . . . . 297  
 do not bleach (🚫) . . . . . 257  
 do not enter  
   🚫 . . . . . 311–312  
   🚫 . . . . . 257  
 do not iron (🚫) . . . . . 257


- do not litter (🚫) . . . . . 254  
do not tumble dry (🌀) . . . . . 257  
do not walk (🚫) . . . . . 271  
do not wash (🚫) . . . . . 257  
DocHub (📄) . . . . . 315–318  
Docker (🐳)<sup>+</sup> . . . . . 315–319  
document  
  📄 . . . . . 309  
  📄 . . . . . 313  
  📄 . . . . . 313  
  add (📄) . . . . . 309  
  delete (🗑️) . . . . . 309  
  picture (🖼️) . . . . . 312  
  text (📄)<sup>+</sup> . . . . . 309, 312  
  text and picture (🖼️) . . . . . 312
- dodecaedron (🔷) . . . . . 311–312  
dodo (🦋) . . . . . 262  
dog  
  🐶 . . . . . 327  
  🐶 . . . . . 263  
  🐶 . . . . . 264–267  
  🐶 . . . . . 262  
  🐶 . . . . . 262  
  🐶 . . . . . 268  
  🐶 . . . . . 268  
Dohse, Max . . . . . 371  
DOI  
  📄 . . . . . 330–331  
  doi . . . . . 330–331
- dolium (🍷) . . . . . 200  
dollar banknote . *see* banknote,  
  dollar  
dollar sign  
  \$<sup>+</sup> . . . . . 18, 19, 31, 381  
  \$ . . . . . 37  
  \$ . . . . . 32  
  🇺🇸 . . . . . 271  
  \$ . . . . . 32  
  \$ . . . . . 31  
  \$ . . . . . 300  
  \$ . . . . . 313  
  blackboard bold (\$) . . . . . 163  
  math mode . . . . . 36, 124  
  negated (🇺🇸) . . . . . 271
- dolls  
  👶 . . . . . 302  
  👶 . . . . . 313
- dolphin  
  🐬 . . . . . 264–267  
  🐬 . . . . . 264–267
- 🐦 . . . . . 262  
  🐦 . . . . . 268  
  🐦 . . . . . 268  
  🐦 . . . . . 268
- dominance (<)<sup>+</sup> . *see* precedes  
negative (↗)<sup>+</sup> . . . . . *see*  
  precedes, negated  
negative weak (↘)<sup>+</sup> . *see* pre-  
  cedes, or equal to, negated  
strict (≪)<sup>+</sup> . . *see* precedes,  
  double  
weak (≲)<sup>+</sup> . *see* precedes, or  
  equal to
- domino tiles . . . . . 237  
donate (👉) . . . . . 173–175  
dong (🇩) . . . . . 31  
door  
  🚪 . . . . . 323–325  
  🚪 . . . . . 323–325  
  🚪 . . . . . 297  
  🚪 . . . . . 254
- dot . . . . . *see also* colon  
five (::)<sup>+</sup> . . . . . 39, 152, 211  
four (::)<sup>+</sup> . . . . . 40, 152, 211  
lower (.)<sup>+</sup> 19, 151–153, 211,  
  373  
middle (·)<sup>+</sup> 38–40, 42, 152,  
  153, 211  
three (∴) . . . . . 211  
two (∴) . . . . . 211
- dot symbols . . . . . 19, 151–153, 373  
DotArrow (package) . . . . . 147, 387,  
  388
- dotless *i* (ı) . . . . . 26, 136, 157  
  math mode . . . . . 136, 157  
  text mode . . . . . 26  
dotless *j* (j) . . . . . 26, 136, 157  
  math mode . . . . . 136, 157  
  text mode . . . . . 26
- double thumb (👉) . . . . . 214  
doughnut  
  🍩 . . . . . 285  
  🍩 . . . . . 287
- dove  
  🕊️ . . . . . 200  
  🕊️ . . . . . 263  
  🕊️ . . . . . 343–346  
  🕊️ . . . . . 297
- down bow (🏹) . . . . . 214  
Downes, Michael J. . . . . 119, 390  
download  
  📄 . . . . . 173–175  
  📄 . . . . . 171–172  
  📄 . . . . . 171–172
- downpour (🌧️) . . . . . 259  
Doyle, Sir Arthur Conan . . . . . 355
- dozenal (package) 155, 269, 387,  
  388  
dozenal (base 12) . . . . . 155, 269  
  numerals . . . . . 155  
  tally markers . . . . . 269  
dracma (₰) . . . . . 32  
dragon . . . . . 268  
  🐉 . . . . . 263  
  🐉 . . . . . 262  
  🐉 . . . . . 262  
  🐉 . . . . . 268  
  🐉 . . . . . 268
- dragonfly (🦋) . . . . . 264–267  
DreamHost (🌐) . . . . . 318–319  
dress  
  👗 . . . . . 297  
  👗 . . . . . 281
- dressing table (🪞) . . . . . 325–327  
Dribbble  
  🏀 . . . . . 314  
  🏀 . . . . . 314
- Dropbox (📁)<sup>+</sup> . . . . . 314–318  
droplet  
  💧 . . . . . 297  
  💧 . . . . . 313
- drum  
  🥁 . . . . . 323–325  
  🥁 . . . . . 297
- Drupal (🐘) . . . . . 315–318  
dry cleaning  
  any solvent (🧼) . . . . . 257  
  hydrocarbon solvents (HCS)  
  only (🧼) . . . . . 257  
  hydrocarbon solvents (HCS)  
  only, delicate (🧼) . . . . . 257  
  tetrachloroethylene (PCE)  
  only (🧼) . . . . . 257  
  tetrachloroethylene (PCE)  
  only, delicate (🧼) . . . . . 257
- Dryad  
  🌿 . . . . . 330–331  
  🌿 . . . . . 330–331
- dryer (👕) . . . . . 325–327  
dsfont (package) . . . . . 162, 387  
dsserif (package) . . . . . 162, 387  
duck  
  🦆 . . . . . 264–267  
  🦆 . . . . . 264–267


 ..... 264–267


 ..... 264–267


 ..... 262


due volte  ..... 214


dumbbell  ..... 240

dumpling  ..... 285

dumpster  ..... 323–325



dumpster fire  ..... 328–329

dunce cap, as math-mode accent  
 ..... 138


dungeon  ..... 323–325

Dungeons and Dragons *see* D&D

duodecimal (base 12) . 155, 269  
numerals ..... 155  
tally markers ..... 269

DVD  
 ..... 297  
 ..... 313

DVI ..... 34, 169, 376  
.dvi files ..... 384

Dyalog  ..... 315–318







**E**






e (e) ..... 124


e-commerce (€) ..... 32




e-mail ..... *see* envelope


ε-TeX ..... 127


eagle  
 ..... 200  
 ..... 343–346  
 ..... 343–346  
 ..... 343–346  
 ..... 343–346  
 ..... 343–346


ear  
 ..... 262  
 ..... 325–327  
 ..... 297  
 ..... 312  
with hearing aid  . . . 297


EarlyBirds  ..... 315–318


Earth . *see also* globe, 166, 168,  
312–314, 335–338  
+ ..... 166, 168  
 ..... 168  
+ ..... 166–168  
east point (**E**<sup>2</sup>) ..... 168








eat  ..... 208–210


eBay () ..... 315–318




Edge  ..... 315–318






Edge Legacy () ..... 315–318







edit + ..... 171–175

egg  
 ..... 323–325  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 285



eggbeater  ..... 288

eggplant  
 ..... 286–287  
 ..... 285  
 ..... 287


eighth note ()+ ..... 212, 213,  
215–218  
dotted ()+ ..... 216–218  
double dotted ()+ . 217,  
218  
rest ()+ ..... 214, 215, 219  
rest, dotted () ..... 219

eject  
 ..... 256  
 ..... 255  
 ..... 255  
 ..... 255  
 ..... 255  
 ..... 297









ejective (p) ..... 25

electric plug  
 ..... 297  
 ..... 312


electrical impulse ..... 164

electrical intersection () . . 160


electrical symbols ..... 164





electromotive force ..... 165  
 ..... 165  
 ..... 165  
 ..... 165  
 ..... 165  
 ..... 165  
 ..... 165  
 ..... 165  
 ..... 165







electron (e<sup>-</sup>) ..... 178


electrostatic discharge () . 176


element of (€)<sup>+</sup> ..... *see* set  
membership


Elementor () ..... 315–318

elements ..... 168  
air () ..... 168  
earth () ..... 168  
fire () ..... 168  
water () ..... 168

elephant  
 ..... 264–267  
 ..... 264–267  
 ..... 264–267  
 ..... 343–346  
 ..... 262  
 ..... 268


elevator () ..... 297, 310


elf ()+ ..... 297, 303, 304

Elixir () ..... 318–319

ellipse (o)<sup>+</sup> 193–196, 225–230,  
333–334, 339–340, 358–359  
filled (●)<sup>+</sup> ..... 193, 195  
shadowed (◐) ..... 195  
vertical (o) ..... 194  
vertical, filled (●) ..... 193

ellipsis (...)<sup>+</sup> ..... 19, 22, 36,  
151–153, 157, 373, 384  
anti-diagonal (··)<sup>+</sup> . . 152,  
153, 373  
anti-diagonal, two (··)<sup>+</sup> 40,  
41, 152  
centered (···)<sup>+</sup> . 151–153  
centered, two (··)<sup>+</sup> 39, 40,  
152  
diagonal (···)<sup>+</sup> . . 151–153,  
373  
diagonal, two (··)<sup>+</sup> 40, 41,  
152  
two (··) ..... 152  
vertical (:)<sup>+</sup> ..... 41, 78,  
151–153, 211  
vertical, five (i) ..... 211  
vertical, four (i)<sup>+</sup> 152, 211  
vertical, two (:)<sup>+</sup> . 40, 41,  
152, 211




























































Ello () ..... 315–318

Elm () ..... 318–319

Elsevier (**E**) ..... 330–331

Elsevierquare (**E**) . . . 330–331






- email . . . . . *see* envelope
- Ember () . . . . . 315–318
- emergency sign () . . . . . 271
- emf (package) . . . . . 165, 387, 388
- emgma ()<sup>+</sup> . . . . . 24, 25
- Emmentaler (font) . . . . . 219
- emo (package) 234, 252, 258, 261, 263, 278, 283, 285, 305, 321
- emoji (package) . 234, 252, 258, 261, 263, 278, 283, 285, 305, 321
- emoji . . . . . 234, 249–252, 258, 261–263, 278, 284–285, 288–305, 320–321
- 3D . . . . . 288
- modifiers . . . . . 312
- Empire () . . . . . 315–318
- empty note () . . . . . 313
- empty note pad () . . . . . 313
- empty note page () . . . . . 313
- empty page () . . . . . 313
- empty pages () . . . . . 313
- empty set ( $\emptyset$ )<sup>+</sup> . . . . . 36, 82, 155, 157–159
- reversed ()<sup>+</sup> . . . . . 155, 159
- with bar () . . . . . 155
- with circle () . . . . . 155
- with left arrow () . . . . . 155
- with right arrow () . . . . . 155
- end of proof . . . . . 125, 126, 157, 159–160
-  . . . . . 125
- <sup>+</sup> . . . . . 125, 159
-  . . . . . 126
- END with arrow ()<sup>+</sup> 297, 313
- endofproofwd (package) 126, 387
- engineering symbols . . . . . 159–160, 164, 171
- engma
- lowercase ()<sup>+</sup> . 20, 24, 25
- uppercase () . . . . . 20
- entailment ()<sup>+</sup> . . . . . 113
- not ()<sup>+</sup> . . . . . 114
- not weak ()<sup>+</sup> . . . . . 114
- weak ()<sup>+</sup> . . . . . 113
- enter . . . . . *see also* carriage return, 169
- entering booth () . . . . . 328–329
- enumerate . . . . . 269
- envelope 198, 281, 312–314, 365
-  . . . . . 198
-  . . . . . 171
-  . . . . . 281
-  . . . . . 321
-  . . . . . 173–175
-  . . . . . 173–175
-  . . . . . 173–175
-  . . . . . 270
-  . . . . . 322
-  . . . . . 298
-  . . . . . 314
-  . . . . . 199
- gift () . . . . . 296
- incoming
-  . . . . . 301
-  . . . . . 312
-  . . . . . 312
- open
-  . . . . . 173–175
-  . . . . . 173–175
-  . . . . . 173–175
- stamped ( ) . . . . . 312
- with at sign ( ) . . . . . 312
- with downward arrow ( )<sup>+</sup> . . . . . 298, 312
- with E ( ) . . . . . 297
- with heart
-  . . . . . 290
-  . . . . . 304
-  . . . . . 331
- with lightning ()<sup>+</sup> . 171, 312
- with pen ( ) . . . . . 312
- Envira () . . . . . 315–318
- enya ()<sup>+</sup> . . . . . 24, 25
- Epi-Olmec script . . . . . 208–210
- epiolmec (package) . . . . . 208, 210, 387, 388
- epsdice (package) . 235, 387, 388
- epsilon
- lowercase ( $\epsilon$ )<sup>+</sup> . 20, 23–25, 120, 121
- lowercase backward ( $\zeta$ )<sup>+</sup> 23, 25, 68, 122, 159, 368
- lowercase closed ( $\vartheta$ ) . . . . . 22
- lowercase reversed and closed ( $\vartheta$ )<sup>+</sup> . . . . . 22, 24
- lowercase reversed with hook ( $\vartheta$ )<sup>+</sup> . . . . . 23, 24
- lowercase variant ( $\epsilon$ )<sup>+</sup> 120–122
- lowercase with hook ( $\epsilon$ ) 24
- uppercase (E)<sup>+</sup> . . . . . 20, 120
- equal (=)<sup>+</sup> . 71, 74, 91, 156, 157
- arc ( $\cong$ )<sup>+</sup> . 74, 76, 77, 117
- arc, negated ( $\not\cong$ ) . . . . . 75, 117
- asterisk ( $\cong^*$ ) . . . . . 77
- asymptotically ( $\asymp$ )<sup>+</sup> 67, 74, 77, 116, 117
- asymptotically, negated ( $\not\asymp$ )<sup>+</sup> . 69, 70, 75, 78, 116, 117
- bump
- <sup>+</sup> . . . . . 68–70, 73, 76, 77
- <sup>+</sup> . . . . . 68–70, 73, 76, 77
- <sup>+</sup> . . . . . 69, 71, 76
- <sup>+</sup> . . . . . 73, 77
- bump, negated
- $\neq^+$  . . . . . 69, 72, 74, 78
- $\neq^+$  . . . . . 69, 72, 74, 78
- $\neq$  . . . . . 72
- $\neq$  . . . . . 74
- by definition ( $\stackrel{\text{def}}{=}$ ) . . . . . 78
- closed
- $\equiv$  . . . . . 70
- $\equiv$  . . . . . 71
- closed, negated
- $\not\equiv$  . . . . . 72
- $\not\equiv$  . . . . . 72
- colon
- $-:$ <sup>+</sup> . . . . . 69, 79
- $=:$ <sup>+</sup> . . . . . 69, 74, 78, 79, 81
- colon, double
- $-::$ <sup>+</sup> . . . . . 69, 79
- $=::$ <sup>+</sup> . . . . . 69, 79, 81
- decorative
- $\equiv$  . . . . . 156
- $\equiv$  . . . . . 157
- decorative, negated ( $\not\equiv$ ) 157
- dot
- $\doteq^+$  67, 69, 71, 73, 76, 77
- $\doteq^+$  . . . . . 69, 71, 74, 78
- dot, negated
- $\not\doteq^+$  . . . . . 72, 75
- $\not\doteq^+$  . . . . . 72, 75
- dots
- $\doteq^+$  . 68, 69, 71, 73, 74, 76–78
- $\doteq$  . . . . . 77
- dots, falling ( $\doteq$ )<sup>+</sup> . 68, 69, 71, 73, 76, 77
- dots, falling, negated ( $\not\doteq$ )<sup>+</sup> . . . . . 72, 75
- dots, negated ( $\not\doteq$ )<sup>+</sup> . 72, 75
- dots, rising ( $\doteq$ )<sup>+</sup> 68–70, 73, 76, 77
- dots, rising, negated ( $\not\doteq$ )<sup>+</sup> . . . . . 72, 75
- double (=) . . . . . 78
- extensible ( $\stackrel{\text{ext}}{=}$ )<sup>+</sup> 146, 147
- hat ( $\hat{=}$ )<sup>+</sup> . . . . . 70, 74
- hat, negated ( $\not\hat{=}$ )<sup>+</sup> . . . . . 72, 75

hollow ( $\text{⊖}$ ) . . . . . 156  
 measure ( $\text{⊞}$ ) . . . . . 77  
 negated ( $\text{≠}$ )<sup>+</sup> . . . 70, 72, 73,  
 75, 76, 78, 85, 91, 157  
 or greater than  
 $\text{⋈}^+$  . . . . . 85–90  
 $\text{⋉}$  . . . . . 89  
 $\text{⋊}$  . . . . . 89  
 $\text{⋋}$  . . . . . 90  
 or greater than, dotted ( $\text{⋌}$ )  
 . . . . . 89  
 or greater than, negated  
 ( $\text{⋍}$ )<sup>+</sup> . . . . . 86–88, 90  
 or less than  
 $\text{⋎}^+$  . . . . . 85–90  
 $\text{⋏}$  . . . . . 89  
 $\text{⋐}$  . . . . . 90  
 $\text{⋑}$  . . . . . 90  
 or less than, dotted ( $\text{⋒}$ ) 89  
 or less than, negated ( $\text{⋓}$ )<sup>+</sup>  
 . . . . . 86–88, 90  
 or precedes ( $\text{⋔}$ )<sup>+</sup> . . . 68–70,  
 73, 76, 77  
 or precedes, negated ( $\text{⋕}$ )<sup>+</sup> .  
 . . . . . 70, 72, 75  
 or succeeds ( $\text{⋖}$ )<sup>+</sup> . . . 68–70,  
 73, 76, 77  
 or succeeds, negated ( $\text{⋗}$ )<sup>+</sup> .  
 . . . . . 70, 72, 75  
 parallel ( $\text{⋘}$ )<sup>+</sup> . . . . . 76, 78  
 parallel slanted ( $\text{⋙}$ ) . . . . 78  
 parallel slanted, similar ( $\text{⋚}$ )  
 . . . . . 77  
 question mark ( $\text{⋛}$ ) . . . . 78  
 ring  
 $\text{⋜}^+$  68, 69, 71, 74, 76, 78  
 $\text{⋝}^+$  . . . 68–70, 73, 76, 77  
 ring, negated  
 $\text{⋞}^+$  . . . . . 72, 75  
 $\text{⋟}^+$  . . . . . 72, 74  
 similar  
 $\text{⋠}^+$  . . . 69, 71, 74, 76, 78  
 $\text{⋡}$  . . . . . 70  
 $\text{⋢}$  . . . . . 78  
 similar, negated  
 $\text{⋣}^+$  . . . . . 72, 75, 78  
 $\text{⋤}$  . . . . . 72  
 star ( $\text{⋥}$ )<sup>+</sup> . . . . . 73, 77  
 star, negated ( $\text{⋦}$ ) . . . . 74  
 triangle ( $\text{⋧}$ )<sup>+</sup> 36, 76, 91–93  
 triangle, negated ( $\text{⋨}$ )<sup>+</sup> . 92,  
 93  
 triple ( $\text{⋩}$ ) . . . . . 78  
 V ( $\text{⋪}$ )<sup>+</sup> . . . . . 74, 76, 78  
 V, negated ( $\text{⋫}$ ) . . . . . 75



wedge ( $\text{⋬}$ )<sup>+</sup> . . . . . 74, 78  
 wedge, negated ( $\text{⋭}$ ) . . . . 75  
 equidecomposable . . . . . 369  
 equilibrium ( $\text{⋮}$ )<sup>+</sup> *see* harpoon,  
 double, opposite sides  
 equivalence  
 $\text{⋯}^+$  36, 67, 71, 73, 78, 154  
 $\text{⋰}$  . . . . . 154  
 closed ( $\text{⋱}$ ) . . . . . 71  
 closed, negated ( $\text{⋲}$ ) . . . . 72  
 entailment ( $\text{⋳}$ )<sup>+</sup> . . . . 113  
 implication ( $\text{⋴}$ )<sup>+</sup> . . . . 113  
 intuitionistic ( $\text{⋵}$ )<sup>+</sup> . . . . 114  
 material ( $\text{⋶}$ )<sup>+</sup> . . . . 113, 114  
 negated ( $\text{⋷}$ )<sup>+</sup> 69, 70, 72, 75,  
 76, 78, 81  
 not entailment ( $\text{⋸}$ )<sup>+</sup> 114  
 not implication ( $\text{⋹}$ )<sup>+</sup> 114  
 not intuitionistic ( $\text{⋺}$ )<sup>+</sup> 115  
 not material ( $\text{⋻}$ )<sup>+</sup> . . . . 114  
 not weak entailment  
 ( $\text{⋼}$ )<sup>+</sup> . . . . . 114  
 not weak implication ( $\text{⋽}$ )<sup>+</sup>  
 . . . . . 115  
 not weak material ( $\text{⋾}$ )<sup>+</sup> .  
 . . . . . 115  
 parallel slanted ( $\text{⋿}$ ) . . . . 77  
 weak entailment ( $\text{⋰}$ )<sup>+</sup> . . .  
 . . . . . 113  
 weak implication ( $\text{⋱}$ )<sup>+</sup>  
 . . . . . 114  
 weak material ( $\text{⋲}$ )<sup>+</sup> 114  
 with dots  
 $\text{⋳}$  . . . . . 77  
 $\text{⋴}$  . . . . . 78  
 with vertical lines  
 $\text{⋵}$  . . . . . 78  
 $\text{⋶}$  . . . . . 78  
 $\text{⋷}$  . . . . . 154  
 $\text{⋸}$  . . . . . 24  
 er ( $\text{⋹}$ ) . . . . . 173–175  
 eraser ( $\text{⋺}$ ) . . . . . 315–319  
 Erlang ( $\text{⋻}$ )<sup>+</sup> . . . . . 168  
 Eros ( $\text{⋼}$ ) . . . . . 178  
 error ( $\text{⋽}$ ) . . . . . 310  
 escalators . . . . . 18  
 escapable characters . . . . 23–25  
 esh ( $\text{⋾}$ )<sup>+</sup> . . . . . 23  
 reversed with loop ( $\text{⋿}$ ) . . . 23  
 esint (package) . . . . . 57, 387  
 esrelation (package) . . . 115, 149,  
 387  
 estimated (e) . . . . . 34  
 Estonia ( $\text{⋰}$ ) . . . . . 243  
 esvect (package) . . . . . 142, 387  
 eszett ( $\text{⋱}$ ) . . . . . *see* sharp s

eta  
 lowercase ( $\text{⋲}$ )<sup>+</sup> 20, 120, 121  
 uppercase ( $\text{⋳}$ )<sup>+</sup> . . . 20, 120  
 eth  
 lowercase ( $\text{⋴}$ )<sup>+</sup> . . . 20, 24, 25,  
 157, 160, 383  
 uppercase ( $\text{⋵}$ )<sup>+</sup> 20, 25, 383  
 Ethereum ( $\text{⋶}$ ) . . . . . 315–318  
 Ethernet ( $\text{⋷}$ ) . . . . . 173–175  
 Etsy ( $\text{⋸}$ ) . . . . . 315–318  
 eufлаг (package) . . . 246, 387, 388  
 eufrak (package) . . . . . 162  
 Euler Roman . . . . . 121  
 Euler’s constant ( $\text{⋹}$ ) . . . . . 124  
 euro ( $\text{⋺}$ )<sup>+</sup> . . . . . 31–33, 384  
 blackboard bold ( $\text{⋻}$ )<sup>+</sup> . 163  
 euro banknote . . *see* banknote,  
 euro  
 European countries . . . 242–244  
 eurosym (package) 33, 387, 388  
 euscript (package) 162, 387, 388  
 evaluated at ( $\text{⋼}$ )<sup>+</sup> *see* vertical bar  
 Evernote ( $\text{⋽}$ ) . . . . . 315–318  
 evil spirits . . . . . 277  
 ewe ( $\text{⋾}$ ) . . . . . 206  
 example ( $\text{⋿}$ ) . . . . . 178  
 excavator ( $\text{⋰}$ ) . . . . . 325–327  
 excess ( $\text{⋱}$ )<sup>+</sup> *see* equal, colon, *see*  
 minus, colon  
 exchange ( $\text{⋲}$ ) . . . . . 173–175  
 exchange eligible ( $\text{⋳}$ ) . . . . 176  
 exciton ( $\text{⋴}$ )<sup>+</sup> . . . . . 178  
 exclamation point  
 ! . . . . . 37  
 ! . . . . . 22  
 ! . . . . . 302  
 ! . . . . . 296  
 ! . . . . . 199  
 ! . . . . . 199  
 ! . . . . . 199  
 and question mark (!?) 298  
 double  
 !! . . . . . 160  
 !! . . . . . 170  
 !! . . . . . 297  
 upside-down (i) . . . . . 19  
 exclusive disjunction, logical ( $\text{⋵}$ )  
 . . . *see* vee, bar under  
 exclusive or . . . . . 367  
 $\text{⋶}$  *see* circled symbols, plus  
 $\text{⋷}$  . . . . *see* vee, bar under  
 Exherbo ( $\text{⋸}$ ) . . . . . 318–319  
 exists ( $\text{⋹}$ )<sup>+</sup> . . . . . 66, 123–125

exclamation point (❗)<sup>+</sup> 125  
 negated (⚡)<sup>+</sup> . . . 123–125  
 tilde (̃)<sup>+</sup> . . . . . 125

expand  
 . . . . . 173–175  
 . . . . . 173–175  
 . . . . . 173–175

ExpeditedSSL (🔒) . . . 315–318  
 experimental (⚗) . . . . . 177  
 exploding head (💣) . . . . . 298  
 explosion proof (🔥) . . . . . 176

export  
 . . . . . 171–172  
 . . . . . 171–172

extrarrows (package) . . 146, 387, 388

extensible accents 139–142, 144, 145, 151, 171, 374–375



extensible braces 139–141, 144, 171

extensible symbols . . . 139–142, 144–150, 165, 367  
 creating . . . . . 374–375

extensible tildes . . . . . 139, 144






extension characters . . . . . 118











external (🔗) . . . . . 177

external link  
 . . . . . 173–175  
 . . . . . 173–175



extpfeil (package) . 147, 387, 388






extraipa (package) . . . . . 28, 387

extraterrestrial  
 . . . . . 279  
 . . . . . 292  
 . . . . . 292  
 . . . . . 307  
 . . . . . 307

eye  
 . . . . . 311–312  
 . . . . . 198  
 . . . . . 173–175  
 . . . . . 173–175  
 . . . . . 343–346  
 . . . . . 201  
 . . . . . 201  
 . . . . . 322  
 . . . . . 298  
 . . . . . 312

eye dropper (👁️) . . . . . 323–325

eyeglasses  
 . . . . . 323–325  
 . . . . . 298

eyes  
 . . . . . 281  
 . . . . . 331  
 . . . . . 331  
 . . . . . 298  
 . . . . . 312

ezh (з) . . . . . *see* round z

**F**

F  
 inverted (⌋)<sup>+</sup> . . . 123, 124

face 159–160, 170, 200, 253, 257, 278, 284, 288–307, 311–312, 334–338, 343–346

angry (😡)<sup>+</sup> . 289, 292, 305  
 angry, with horns (😡) . 292  
 anguished (😞)<sup>+</sup> . 289, 292  
 annoyed (😏) . . . . . 288  
 annoyed, 3D (😏) . . . . . 288  
 anxious, with sweat (😓) 292  
 astonished (😲)<sup>+</sup> . 289, 292  
 beaming, with smiling eyes (😄) . . . . . 293  
 blowing a kiss (😘) . . . 298  
 cold (🥶) . . . . . 296  
 confounded (😖)<sup>+</sup> 289, 296  
 confused (😕)<sup>+</sup> . . 289, 296  
 cool (😎) . . . . . 288  
 cool, 3D (😎) . . . . . 288  
 cowboy hat (🤠) . . . . . 296  
 crying (😭)<sup>+</sup> . . . . . 289, 296  
 disappointed (😞)<sup>+</sup> 289, 297  
 disappointed but relieved (😏) . . . . . 289  
 disguised (😬) . . . . . 297  
 dizzy (😵)<sup>+</sup> . . . . . 289, 305  
 downcast, with sweat (😓) . . . . . 297  
 drooling (😬) . . . . . 297  
 expressionless (😐)<sup>+</sup> . 289, 298  
 fearful (😨)<sup>+</sup> . . . . . 289, 298  
 flushed (😳)<sup>+</sup> . . . 289, 299  
 frowning (☹)<sup>+</sup> . . 253, 257, 299, 305, 311–312  
 frowning, with open mouth (😬)<sup>+</sup> . . . . . 289, 299  
 grimacing (😬)<sup>+</sup> . 257, 289, 300  
 grinning (😄)<sup>+</sup> 289, 300, 305  
 grinning and squinting (😏)<sup>+</sup> . . . . . 300, 306

grinning and squinting, with tears (😏)<sup>+</sup> . . . . . 306

grinning and sweating (😓)<sup>+</sup> . . . . . 305

grinning and winking (😏)<sup>+</sup> . . . . . 305

grinning, with big eyes (😄) . . . . . 300

grinning, with hearts (😍)<sup>+</sup> . . . . . 306

grinning, with smiling eyes (😄)<sup>+</sup> . . . . . 289, 300

grinning, with stars (😍)<sup>+</sup> . . . . . 306

grinning, with sweat (😓) 300

grinning, with tears (😓)<sup>+</sup> . . . . . 306

grinning, with tongue (😛)<sup>+</sup> . . . . . 306

hieroglyphic (🐸)<sup>+</sup> . . . 202

hot (🔥) . . . . . 301

hugging (🤗) . . . . . 301

hushed (😬)<sup>+</sup> . . . 289, 301

innocent (😇) . . . . . 288

innocent, 3D (😇) . . . . . 288

kissing (😘)<sup>+</sup> . 289, 303, 305

kissing, with closed eyes (😘)<sup>+</sup> . . . . . 289, 303

kissing, with smiling eyes (😘)<sup>+</sup> . . . . . 289, 303

knocked-out (😵) . . . . . 303

laughing (😄)<sup>+</sup> . . 288, 305

laughing, 3D (😄) . . . . . 288

loudly crying (😭)<sup>+</sup> 289, 303

lying (😏) . . . . . 304

man (👨) . . . . . 257

massage (👉) . . . . . 307

meh (😐)<sup>+</sup> . . . . . 305, 306

money-mouth (😬) . . . 292

nauseated (🤢) . . . . . 292

nerd (🤓) . . . . . 292

neutral (😐)<sup>+</sup> 288, 289, 293

neutral, 3D (😐) . . . . . 288

ninja (🥷) . . . . . 288

ninja, 3D (🥷) . . . . . 288

nurse (👩) . . . . . 288

nurse, 3D (👩) . . . . . 288

partying (🎉) . . . . . 294

pensive (😞)<sup>+</sup> . . . 289, 294

persevering (😬)<sup>+</sup> 289, 294





person with pouting (😬) . . . . . 289


pleading (😞) . . . . . 295

pounding on wall (👊)<sup>+</sup> 288



- pounding on wall, 3D (👊) . . . . . 288
- pouting (😡)+ . . . . . 289, 296
- relieved (😌)+ . . . . . 289, 297
- S-mouth (☹) . . . . . 288
- S-mouth, 3D (😬) . . . . . 288
- sad (☹)+ . . . . . 284, 288, 306
- sad but relieved (😌) . . . . . 297
- sad, 3D (😬) . . . . . 288
- savoring food (😋) . . . . . 298
- savouring delicious food (😋) . . . . . 289
- screaming in fear (😱)+ 289, 298
- shushing (🤫) . . . . . 298
- sleeping (😴)+ . . . . . 289, 298
- sleepy (😪)+ . . . . . 288, 289, 298
- sleepy, 3D (😴) . . . . . 288
- slightly frowning (😞)+ 289, 298
- slightly smiling (😊)+ 289, 298
- smiley (😊)+ 170, 253, 257, 284
- smiley, inverse (😄)+ 159, 170, 253, 284
- smiling (😊)+ . . . . . 288, 298, 311–312
- smiling, 3D (😄) . . . . . 288
- smiling, with halo (😇)+ 289, 298
- smiling, with heart-shaped eyes (😍)+ . . . . . 289, 298
- smiling, with hearts (😍) 298
- smiling, with horns (👹)+ . . . . . 289, 298
- smiling, with open mouth (😊) . . . . . 289
- smiling, with open mouth and cold sweat (😓) . 289
- smiling, with open mouth and smiling eyes (😄) 289
- smiling, with open mouth and tightly-closed eyes (😊) . . . . . 289
- smiling, with smiling eyes (😊)+ . . . . . 289, 298
- smiling, with sunglasses (😎)+ . . . . . 289, 298
- smiling, with tear (😓) . 298
- smirking (😏)+ . . . . . 289, 298
- sneezing (🤧) . . . . . 299
- squinting, with tongue (😜) . . . . . 299
- sun with (☀)+ . . . . . 167, 299
- thinking (🤔) . . . . . 300
- throwing a kiss (💋) . . . . . 289
- tired (😫)+ . . . . . 289, 300
- tongue-out (😛) . . . . . 288
- tongue-out, 3D (😛) . . . . . 288
- unamused (😏)+ . . . . . 289, 301
- upside-down (🙄)+ 289, 301
- vomiting (🤮)+ . . . . . 288, 298
- vomiting, 3D (🤮) . . . . . 288
- weary (😫)+ . . . . . 289, 302
- wind blowing (🌪) . . . . . 258
- winking (😉)+ 288, 289, 302
- winking, 3D (😉) . . . . . 288
- winking, with tongue (😜) . . . . . 302
- with cold sweat (😓) . . . . . 289
- with hand over mouth (🙊) . . . . . 298
- with head-bandage (🤕) 298
- with look of triumph (😏) . . . . . 289
- with medical mask (😷)+ . . . . . 289, 298
- with monocle (👁) . . . . . 298
- with no good gesture (🙄) . . . . . 289
- with ok gesture (👌) . . . . . 289
- with open mouth (😜)+ 289, 298
- with open mouth and cold sweat (😓) . . . . . 289
- with raised eyebrow (😏) 298
- with rolling eyes (🙄)+ 289, 298
- with steam from nose (👃) . . . . . 298
- with stuck-out tongue (😛) . . . . . 289
- with stuck-out tongue and tightly-closed eyes (😓) 289
- with stuck-out tongue and winking eye (😜) . . . . . 289
- with sunglasses (😎)+ . 257
- with symbols on mouth (👄) . . . . . 298
- with tears of joy (😂)+ 289, 298
- with thermometer (🌡) 298
- with tongue (😜) . . . . . 298
- without mouth (😜)+ . 289, 298
- woman (👩) . . . . . 257
- woozy (😵) . . . . . 304
- worried (😟)+ . . . . . 289, 304
- X-eyes (😈) . . . . . 288
- X-eyes, 3D (😈) . . . . . 288
- yawning (😴) . . . . . 304
- zany (🤪) . . . . . 304
- zipper-mouth (😬) . . . . . 304
- Facebook
- f** . . . . . 315–318
- fb** . . . . . 315–318
- fb** . . . . . 315–318
- 📧** . . . . . 314
- f** . . . . . 314
- Facebook Messenger (📧) . 315–318
- facepalming (🤦)+ 294, 303, 304
- factory
- 🏭 . . . . . 298
- 👷 . . . . . 314
- factory worker (👷)+ . . . . . 298, 303, 304
- fairy (🧚)+ . . . . . 298, 303, 304
- falafel (🥙) . . . . . 285
- false (F) . . . . . 125
- falsum (⬇)+ . *see* turnstile, up
- family (👨) . . . . . 307
- fan
- 🌀 . . . . . 323–325
- 🌀 . . . . . 325–327
- 🌀 . . . . . 325–327
- Fantasy Flight Games (🎮) 315–318
- farmer (👨) . . . . . 298, 303, 304
- fast forward *see* media control symbols, forward
- Father Christmas (👶)+ . . . *see* Santa Claus
- faucet (🚰) . . . . . 323–325
- fax
- FAX . . . . . 171
- 📠 . . . . . 171
- fax machine
- 📠 . . . . . 171
- 📠 . . . . . 323–325
- 📠 . . . . . 298
- 📠 . . . . . 314
- 📠 . . . . . 312
- fc (package) . . . . . 21, 26
- fclfont (package) . . . . . 387
- .fd files . . . . . 16, 378, 385
- fdsymbol (package) . . . . . 40, 41, 46, 59, 60, 73–75, 84, 88, 93, 100–105, 117, 123, 124, 130, 131, 137, 140, 152, 156, 159, 192, 213, 233, 387, 388


feather

-  ..... 311–312
-  ..... 323–325
-  ..... 322
-  ..... 298



FedEx () ..... 315–318


Fedora


-  ..... 315–318
-  ..... 318–319



feeding baby ()<sup>+</sup> 294, 303, 304

feet

- <sup>+</sup> ..... *see prime*
- <sup>+</sup> ..... *see quotation marks, straight single*




fencing () ..... 294

fermata () ..... 214, 220, 221



- accent ()<sup>+</sup> ..... *see accents, fermata*
- inverted () ..... 214


Fermi distribution ( $\mathcal{F}$ ) ..... 177

fermion ..... 177–178

- $\mathcal{F}$  ..... 177
-  ..... 177
-  ..... 177
-  ..... 177
- $=$  ..... 177

ferris wheel


-  ..... 299
-  ..... 313

ferry () ..... 299

feyn (package) ... 177, 387, 388

Feynman slashed character notation ..... 370



Feynman-diagram symbols . 177

fez, as math-mode accent () 138

fge (package) 111, 125, 137, 154, 160, 387, 388


field ( $\mathbb{F}$ ) . *see alphabets, math*


field hockey stick and ball

-  ..... 299
-  ..... 241



figbas (package) ..... 360, 387

figchild (package) 259, 264, 267, 270, 279, 286, 287, 325, 331, 387, 388


fighter jet ()<sup>+</sup> . *see airplane, military*

Figma () ..... 315–318

Figshare

-  ..... 330–331
-  ..... 330–331

file cabinet

-  ..... 299

-  ..... 313


file extensions

- .dvi ..... 384
- .fd ..... 16, 378, 385
- .mf ..... 16, 332, 376
- .otf ..... 212
- .pdf ..... 384
- .sty ..... 16
- .tex ..... 384, 385
- .tfm 16, 162, 332, 366, 385

file folder () ..... 313

file symbols ..... 309

fill

-  ..... 173–175
-  ..... 173–175

film

-  ..... 173–175
-  ..... 322
-  ..... 299
-  ..... 313

film projector

-  ..... 299
-  ..... 312

filter ()<sup>+</sup> ..... 171–175


finger, pointing ..... *see fists*

fingerprint () ..... 173–175

finite field ( $\mathbb{F}$ ) . . *see alphabets, math*

Finland () ..... 243

fire

-  ..... 270, 290
-  ..... 168
-  ..... 173–175
-  ..... 328–329
-  ..... 318–319
-  ..... 299
-  ..... 313

fire engine

-  ..... 320
-  ..... 254
-  ..... 254

fire extinguisher

-  ..... 323–325
-  ..... 299


firecracker () ..... 299

firefighter ()<sup>+</sup> . . 299, 303, 304

Firefox



-  ..... 315–318
-  ..... 315–318


fireworks

-  ..... 299
-  ..... 312






























first aid () ..... 319

First Order



-  ..... 315–318
-  ..... 315–318

Firstdraft () ..... 315–318

fish












































































































-  ..... 200
-  ..... 311–312
-  ..... 263
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 264–267
-  ..... 343–346
-  ..... 343–346
- $\mathbb{F}$  ..... 201
-  ..... 201
-  ..... 262
-  ..... 263
-  ..... 268
-  ..... 268



























































































fish cake with swirl










































































































-  ..... 285
-  ..... 287

fish tail

- down ( $\downarrow$ ) ..... 78
- left ( $\leftarrow$ )<sup>+</sup> *see strict converse implication*
- right ( $\rightarrow$ )<sup>+</sup> ..... *see strict implication*





































- up ( $\Upsilon$ ) . . . . . 77
- fish-eye ( $\odot$ ) . . . . . 193
- fishing pole and fish  
 . . . . . 299  
 . . . . . 313
- fists . . . . . *see* hand
- fixed point  
 extended greatest ( $\vec{\nu}$ ) . . . . . 161  
 extended least ( $\vec{\mu}$ ) . . . . . 161  
 greatest ( $\nu$ ) . . . . . 161  
 least ( $\mu$ ) . . . . . 161
- fixmath (package) . . . . . 380
- flag
-  . . . . . 259
-  . . . . . 259
-  . . . . . 284
-  . . . . . 322
-  . . . . . 302
-  . . . . . 293
-  . . . . . 301
-  . . . . . 312
-  . . . . . 312
-  . . . . . 312
-  . . . . . 312
-  . . . . . 254
- 0 () . . . . . 283
- 1 () . . . . . 283
- 2 () . . . . . 283
- 3 () . . . . . 283
- 4 () . . . . . 283
- 5 () . . . . . 283
- 6 () . . . . . 283
- 7 () . . . . . 283
- 8 () . . . . . 283
- 9 () . . . . . 283
- A () . . . . . 283
- Åland ()+ . . . . . 248, 249
- Abkhazia () . . . . . 248
- Afghanistan ()+ . . . . . 247, 249
- Albania ()+ . . . . . 247, 249
- Algeria ()+ . . . . . 248, 249
- American Samoa () . . . . . 249
- Andorra ()+ . . . . . 247, 249
- Angola ()+ . . . . . 247, 249
- Anguilla () . . . . . 249
- Antarctica ()+ . . . . . 248, 249
- Antigua and Barbuda  
 ()+ . . . . . 247, 249
- Argentina ()+ . . . . . 247, 249
- Armenia ()+ . . . . . 247, 249
- Artsakh () . . . . . 248
- Aruba () . . . . . 249
- Ascension Island () . . . . . 249
- Australia ()+ . . . . . 247, 249
- Austria ()+ . . . . . 247, 249, 311–312
- Azerbaijan ()+ . . . . . 247, 249
- B () . . . . . 283
- Bahamas ()+ . . . . . 247, 249
- Bahrain ()+ . . . . . 247, 249
- Bangladesh ()+ . . . . . 247, 249
- Barbados ()+ . . . . . 247, 249
- Belarus ()+ . . . . . 247, 249
- Belgium ()+ . . . . . 247, 249, 311–312
- Belize ()+ . . . . . 247, 249
- Benin ()+ . . . . . 247, 249
- Bermuda () . . . . . 249
- Bhutan ()+ . . . . . 247, 249
- Bolivia ()+ . . . . . 247, 249
- Bonaire () . . . . . 248
- Bosnia and Herzegovina  
 ()+ . . . . . 247, 249
- Botswana ()+ . . . . . 247, 250
- Bouvet Island () . . . . . 250
- Brazil ()+ . . . . . 247, 250
- British Indian Ocean Territory  
 () . . . . . 250
- British Virgin Islands () . . . . . 250
- Brunei ()+ . . . . . 247, 250
- Buddhism () . . . . . 283
- Bulgaria ()+ . . . . . 247, 250, 311–312
- Burgenland () . . . . . 249
- Burkina Faso ()+ . . . . . 247, 250
- Burundi ()+ . . . . . 247, 250
- C () . . . . . 283
- Cambodia ()+ . . . . . 248, 250
- Cameroon ()+ . . . . . 248, 250
- Canada ()+ . . . . . 247, 250
- Canary Islands () . . . . . 250
- Cape Verde ()+ . . . . . 248, 250
- Caribbean Netherlands ()  
 . . . . . 250
- Carinthia () . . . . . 249
- Cayman Islands () . . . . . 250
- Central African Republic  
 ()+ . . . . . 247, 250
- Ceuta and Melilla () . . . . . 250
- Chad ()+ . . . . . 247, 250
- checkered ()+ . . . . . 241, 284, 295
- Chile ()+ . . . . . 248, 250
- China ()+ . . . . . 248, 250
- Christian () . . . . . 283
- Christmas Island () . . . . . 250
- Clipperton Island () . . . . . 250
- Cocos Islands () . . . . . 250
- Colombia ()+ . . . . . 248, 250
- Comoros ()+ . . . . . 248, 250
- Congo–Brazzaville ()+ . . . . . 247, 250
- Congo–Kinshasa ()+ . . . . . 247, 250
- Cook Islands ()+ . . . . . 248, 250
- Costa Rica ()+ . . . . . 248, 250
- Côte d’Ivoire ()+ . . . . . 247, 250
- Croatia ()+ . . . . . 247, 250
- Cuba ()+ . . . . . 248, 250
- Curaçao () . . . . . 250
- Cyprus ()+ . . . . . 248, 250
- Czech Republic ()+ . . . . . 248, 250
- D () . . . . . 283
- Democratic Republic of the Congo . . . . . *see* flags, Congo–Kinshasa
- Denmark ()+ . . . . . 248, 250
- Diego Garcia () . . . . . 250
- Djibouti ()+ . . . . . 248, 250
- Dominica ()+ . . . . . 248, 251
- Dominican Republic ()+ . . . . . 248, 251
- E () . . . . . 283




































- Ecuador ()<sup>+</sup> 247, 251  
 Egypt ()<sup>+</sup> . . . 247, 251  
 El Salvador ()<sup>+</sup> . 247, 251  
 England (+) . . . . . 251  
 Equatorial Guinea ()<sup>+</sup> . . . . . 247, 251  
 Eritrea ()<sup>+</sup> . 247, 251  
 Esperanto () . . . . . 283  
 Estonia ()<sup>+</sup> . 247, 251  
 Eswatini () . . . . . 251  
 Ethiopia ()<sup>+</sup> 247, 251  
 European Union ()<sup>+</sup> . . . . . 246, 251, 283  
 F () . . . . . 283  
 Falkland Islands () . . 251  
 Faroe Islands ()<sup>+</sup> 248, 251  
 Fiji ()<sup>+</sup> . . . . . 247, 251  
 Finland ()<sup>+</sup> . 247, 251  
 flags 246–252, 259, 283, 284, 311–312, 343–346, 355–357  
 France ()<sup>+</sup> . . 247, 251, 311–312  
 French Guiana ()<sup>+</sup> 248, 251  
 French Polynesia () . 251  
 French Southern Territories () . . . . . 251  
 G () . . . . . 283  
 Gabon ()<sup>+</sup> . . 247, 251  
 Gambia ()<sup>+</sup> . 247, 251  
 Georgia ()<sup>+</sup> . 247, 251  
 Germany ()<sup>+</sup> 248, 251, 311–312  
 Ghana ()<sup>+</sup> . . 247, 251  
 Gibraltar ()<sup>+</sup> 248, 251  
 Greece ()<sup>+</sup> . . 247, 251  
 Greenland ()<sup>+</sup> 248, 251  
 Grenada ()<sup>+</sup> 247, 251  
 Guadeloupe () . . . . . 251  
 Guam () . . . . . 251  
 Guatemala ()<sup>+</sup> 247, 251  
 Guernsey ()<sup>+</sup> 248, 251  
 Guinea ()<sup>+</sup> . . 247, 251  
 Guinea-Bissau ()<sup>+</sup> 247, 251  
 Guyana ()<sup>+</sup> . 247, 251  
 H () . . . . . 283  
 Haiti ()<sup>+</sup> . . . 247, 251  
 Heard and McDonald Islands () . . . . . 251  
 Holy See () . . . . . 248  
 Honduras ()<sup>+</sup> 247, 251  
 Hong Kong SAR China () . . . . . 251  
 Hungary ()<sup>+</sup> . 247, 252  
 I () . . . . . 283  
 Iceland ()<sup>+</sup> . . 247, 252  
 India ()<sup>+</sup> . . . 247, 252  
 Indonesia ()<sup>+</sup> 247, 252  
 Iran ()<sup>+</sup> . . . 247, 252  
 Iraq ()<sup>+</sup> . . . . 247, 252  
 Ireland ()<sup>+</sup> . 247, 252  
 Isle of Man ()<sup>+</sup> . 248, 252  
 Israel ()<sup>+</sup> . . . 247, 252  
 Italy ()<sup>+</sup> . . . . 247, 252, 311–312  
 Ivory Coast *see* flags, Côte d'Ivoire  
 J () . . . . . 283  
 Jamaica ()<sup>+</sup> 248, 252  
 Japan ()<sup>+</sup> . . . 248, 252  
 Jersey ()<sup>+</sup> . . 248, 252  
 Jolly Roger ()<sup>+</sup> . . . 283  
 Jordan ()<sup>+</sup> . 248, 252  
 K () . . . . . 283  
 Kazakhstan ()<sup>+</sup> 248, 252  
 Kenya ()<sup>+</sup> . . 248, 252  
 Kiribati ()<sup>+</sup> 248, 252  
 Kosovo ()<sup>+</sup> . . 248, 252  
 Kuwait ()<sup>+</sup> . 248, 252  
 Kyrgyzstan ()<sup>+</sup> . 248, 252  
 L () . . . . . 283  
 Laos ()<sup>+</sup> . . . . 248, 252  
 Latvia ()<sup>+</sup> . 247, 252  
 Lebanon ()<sup>+</sup> . 248, 252  
 Lesotho ()<sup>+</sup> . 247, 249  
 Liberia ()<sup>+</sup> . 247, 249  
 Libya ()<sup>+</sup> . . 247, 249  
 Liechtenstein ()<sup>+</sup> 247, 249  
 Lithuania ()<sup>+</sup> 247, 249  
 Lower Austria () . . 249  
 Luxembourg ()<sup>+</sup> 247, 249, 311–312  
 M () . . . . . 283  
 Macao SAR China () 249  
 Madagascar ()<sup>+</sup> . 247, 249  
 Malawi ()<sup>+</sup> . . 247, 249  
 Malaysia ()<sup>+</sup> 247, 249  
 Maldives *see* flags, Falkland Islands  
 Maldives ()<sup>+</sup> . 247, 249  
 Mali ()<sup>+</sup> . . . . 247, 249  
 Malta ()<sup>+</sup> . . . 247, 249  
 Marshall Islands ()<sup>+</sup> . . . . . 247, 249  
 Martinique () . . . . . 249  
 Mauritania ()<sup>+</sup> 247, 249  
 Mauritius ()<sup>+</sup> 247, 249  
 Mayotte () . . . . . 249  
 Mexico ()<sup>+</sup> . 247, 249  
 Micronesia, Federated States of ()<sup>+</sup> . . . . 247, 249  
 Moldova ()<sup>+</sup> 247, 249  
 Monaco () . . . . . 249  
 Mongolia ()<sup>+</sup> 247, 249  
 Montenegro ()<sup>+</sup> 247, 249  
 Montserrat () . . . . . 249  
 Morocco ()<sup>+</sup> . 247, 249  
 Mozambique ()<sup>+</sup> . 247, 249  
 multiple, crossed  
   ✠ . . . . . 296  
   ✡ . . . . . 312  
 Myanmar ()<sup>+</sup> 247, 249  
 N () . . . . . 283  
 Namibia ()<sup>+</sup> . 247, 249  
 NATO () . . . . . 283  
 Nauru ()<sup>+</sup> . 247, 250  
 Nepal ()<sup>+</sup> . . . . 247, 250  
 Netherlands ()<sup>+</sup> . 247, 250, 311–312  
 New Caledonia () . . . 250

- New Zealand ()<sup>+</sup> 248, 250
- Nicaragua ()<sup>+</sup> 247, 250
- Niger ()<sup>+</sup> . . . . . 247, 250
- Nigeria ()<sup>+</sup> . 247, 250
- Niue ()<sup>+</sup> . . . . . 248, 250
- Norfolk Island () . . . . . 250
- North Korea ()<sup>+</sup> 248, 250
- North Macedonia ()<sup>+</sup> . . . . . 247, 250
- Northern Mariana Islands () . . . . . 250
- Norway ()<sup>+</sup> . . 247, 250
- O () . . . . . 283
- Olympics () . . . . . 283
- Oman ()<sup>+</sup> . . 248, 250
- P () . . . . . 283
- Pakistan ()<sup>+</sup> . 248, 250
- Palau ()<sup>+</sup> . . . . . 248, 250
- Palestinian Territories ()<sup>+</sup> . . . . . 248, 250
- Panama ()<sup>+</sup> . 248, 250
- Papua New Guinea ()<sup>+</sup> . . . . . 248, 250
- Paraguay ()<sup>+</sup> 248, 250
- Peru ()<sup>+</sup> . . . . . 248, 250
- Philippines ()<sup>+</sup> . 248, 250
- pirate *see* flags, Jolly Roger
- Pitcairn Islands () . . 250
- Poland ()<sup>+</sup> . . 248, 250
- Portugal ()<sup>+</sup> . 248, 250
- Puerto Rico ()<sup>+</sup> . 248, 250
- Q () . . . . . 283
- Qatar ()<sup>+</sup> . 248, 250
- R () . . . . . 283
- rainbow ()<sup>+</sup> . . . . . 283
- Red Crescent () . . 283
- Red Cross () . . . . . 283
- Red Crystal () . . . 283
- Republic of the Congo *see* flags, Congo–Brazzaville
- Réunion ()<sup>+</sup> . 248, 250
- Romania ()<sup>+</sup> 248, 250
- Russian Federation ()<sup>+</sup> . . . . . 248, 250
- Rwanda ()<sup>+</sup> . 247, 250
- S () . . . . . 283
- Saba () . . . . . 248
- Saint Barthélemy () . 251
- Saint Eustasius () . 248
- Saint Helena () . . . . . 251
- Saint Kitts and Nevis ()<sup>+</sup> . . . . . 248, 251
- Saint Lucia ()<sup>+</sup> . 247, 251
- Saint Martin () . . . . . 251
- Saint Pierre and Miquelon () . . . . . 251
- Saint Vincent and Grenadines ()<sup>+</sup> . 248, 251
- Salzburg () . . . . . 249
- Samoa ()<sup>+</sup> . 248, 250
- San Marino ()<sup>+</sup> 247, 250
- São Tomé and Príncipe ()<sup>+</sup> . . . . . 247, 251
- Saudi Arabia ()<sup>+</sup> 247, 250
- Scotland () . . . . . 250
- Senegal ()<sup>+</sup> . . 247, 250
- Serbia ()<sup>+</sup> . . 248, 250
- Seychelles ()<sup>+</sup> 247, 250
- Sierra Leone ()<sup>+</sup> . 247, 251
- Singapore ()<sup>+</sup> 247, 251
- Sint Maarten () . . . . . 251
- skull and crossbones . . *see* flags, Jolly Roger
- Slovakia ()<sup>+</sup> . 247, 251
- Slovenia ()<sup>+</sup> 247, 251
- Solomon Islands ()<sup>+</sup> . . . . . 247, 251
- Somalia ()<sup>+</sup> . 247, 251
- Somaliland () . . . 248
- South Africa ()<sup>+</sup> . 248, 251
- South Georgia and South Sandwich Islands () 251
- South Korea ()<sup>+</sup> . 248, 251
- South Sudan ()<sup>+</sup> 247, 251
- Spain ()<sup>+</sup> . . . . . 247, 251
- Sri Lanka ()<sup>+</sup> 247, 251
- Styria () . . . . . 249
- Sudan ()<sup>+</sup> . . 247, 251
- Suriname ()<sup>+</sup> 247, 251
- Svalbard and Jan Mayen () . . . . . 251
- Swaziland () . . . . . 247
- Sweden ()<sup>+</sup> . 247, 251
- Switzerland ()<sup>+</sup> 247, 251
- Syria ()<sup>+</sup> . . . . . 247, 251
- T () . . . . . 283
- Taiwan ()<sup>+</sup> . . 247, 251
- Tajikistan ()<sup>+</sup> . . 247, 251
- Tanzania ()<sup>+</sup> 247, 251
- Thailand ()<sup>+</sup> 247, 251
- The Tyrol () . . . . . 249
- Tibet () . . . . . 248
- Timor-Leste ()<sup>+</sup> 247, 251
- Togo ()<sup>+</sup> . . . . . 247, 251
- Tokelau () . . . . . 251
- Tonga ()<sup>+</sup> . . 247, 251
- transgender () . . . . . 283
- Transnistria () . . 248
- Trinidad and Tobago ()<sup>+</sup> . . . . . 247, 251
- Tristan da Cunha () . 251
- Tunisia ()<sup>+</sup> . . 247, 251
- Turkey ()<sup>+</sup> . . 247, 251
- Turkmenistan ()<sup>+</sup> 247, 251
- Turks and Caicos Islands () . . . . . 252
- Tuvalu ()<sup>+</sup> . 247, 252
- U () . . . . . 283
- Uganda ()<sup>+</sup> . 247, 252
- Ukraine ()<sup>+</sup> . 247, 252
- UNESCO () . . . . . 283
- United Arab Emirates ()<sup>+</sup> . . . . . 247, 252
- United Kingdom ()<sup>+</sup> . . . . . 247, 252
- United Nations ()<sup>+</sup> 252, 283






















































United States ()<sup>+</sup> . 284, 343–346  
 United States Minor Outlying Islands () . . . . . 252  
 United States of America ()<sup>+</sup> . . . . . 248, 252  
 United States Virgin Islands () . . . . . 252  
 Upper Austria () . . 249  
 Uruguay ()<sup>+</sup> 248, 252  
 Uzbekistan ()<sup>+</sup> . 248, 252  
 V () . . . . . 283  
 Vanuatu ()<sup>+</sup> 248, 252  
 Vatican City () . . . . . 252  
 Venezuela ()<sup>+</sup> 248, 252  
 Vienna () . . . . . 249  
 Vietnam ()<sup>+</sup> . 248, 252  
 Vorarlberg () . . . . . 249  
 W () . . . . . 283  
 Wales () . . . . . 252  
 Wallis and Futuna () 252  
 Western Sahara ()<sup>+</sup> . . . . . 248, 252  
 Wieselburger Bier () 283  
 World Health Organization () . . . . . 283  
 X () . . . . . 283  
 Y () . . . . . 283  
 Yemen ()<sup>+</sup> . . 248, 252  
 Z () . . . . . 283  
 Zambia ()<sup>+</sup> . . 248, 252  
 Zimbabwe ()<sup>+</sup> . . 248, 252  
 flageolet () . . . . . 214  
 flamingo  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 262  
 flap (r)<sup>+</sup> . . . . . 24, 25  
 flashlight  
 . . . . . 325–327  
 . . . . . 299  
 . . . . . 313  
 flask () . . . . . 323–325  
 flat (b)<sup>+</sup> . . . . . 212, 213, 216, 219






















double ()<sup>+</sup> . . . . . 216, 219  
 flatbread  
 . . . . . 285  
 . . . . . 285  
 fleur-de-lis () . . . . . 299  
 fleurons . . . . . 191, 198, 338–339  
 flexed biceps  
 . . . . . 299  
 . . . . . 313  
 Flickr  
 . . . . . 315–318  
 . . . . . 314  
 . . . . . 314  
 flint () . . . . . 208–210  
 Flipboard () . . . . . 315–318  
 floppy disk  
 . . . . . 299  
 . . . . . 313  
 . . . . . 312  
 . . . . . 312  
 . . . . . 312  
 florin  
 . . . . . 32  
 f . . . . . 31  
 flourishes . . . 197, 198, 342–348  
 flow  
 . . . . . 171–172  
 . . . . . 171–172  
 . . . . . 171–172  
 . . . . . 171–172  
 flower . 189–191, 281, 290–305, 311–314, 338–340  
 . . . . . 208–210  
 . . . . . 189  
 . . . . . 189  
 . . . . . 189  
 . . . . . 189  
 . . . . . 189  
 . . . . . 189  
 . . . . . 189  
 . . . . . 189  
 . . . . . 189  
 . . . . . 189  
 . . . . . 311–312  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327


















 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 343–346  
 . . . . . 343–346  
 . . . . . 299  
 . . . . . 294  
 . . . . . 302  
 . . . . . 302  
 . . . . . 281  
 . . . . . 281  
 . . . . . 313  
 . . . . . 190  
 . . . . . 190  
 . . . . . 190  
 . . . . . 190  
 . . . . . 190  
 flute () . . . . . 200  
 flying disc () . . . . . 299  
 flying saucer  
 . . . . . 279  
 . . . . . 321  
 Flynn, Peter . . . . . 369  
 \fnsymbol . . . . . 269  
 foal () . . . . . 206  
 fog  
 . . . . . 258  
 . . . . . 258  
 . . . . . 258  
 foggy  
 . . . . . 299  
 . . . . . 312  
 fold () . . . . . 208–210  
 folder () . . . . . 312  
 folder symbols . . . . . 309


























- fondue (🍷) . . . . . 285
- font (A) . . . . . 17, 173–175
- Font Awesome
  - ☐ . . . . . 315–318
  - 📀 . . . . . 315–318
  - 📄 . . . . . 315–318
- font encodings 16, 19–21, 25, 26, 29, 246, 367, 368, 373, 381, 382, 384, 386
  - 7-bit . . . . . 16
  - 8-bit . . . . . 16
  - ASCII . . . . . 386
  - Cyrillic . . . . . 26
  - document . . . . . 382, 384
  - Latin 1 . . . . . 386
  - limiting scope of . . . . . 16
  - LY1 . . . . . 16
  - OT1 . . . . . 16, 20, 26, 246, 373, 381, 382
  - OT2 . . . . . 368
  - T1 16, 19–21, 26, 382, 384
  - T2A . . . . . 26, 368
  - T2B . . . . . 26
  - T4 . . . . . 21, 25, 26, 29
  - T5 . . . . . 21, 26
  - TS1 . . . . . 367, 382
  - TU . . . . . 246
  - U . . . . . 368
  - X2 . . . . . 26
- font families 244, 246, 332, 364, 366, 368, 378
  - bulb . . . . . 378
  - CountriesOfEurope . . . . . 244
  - psy . . . . . 368
  - rojud . . . . . 246
- fontawesome5 (package) 22, 32, 33, 157, 173, 176, 182, 183, 186, 188, 191, 196, 236, 240, 256, 259, 261, 263, 280, 284, 305, 308–310, 315, 319, 320, 323, 328, 387, 388
- fontdef.dtx (file) . . . . . 368, 373
- fontenc (package) 16, 20, 21, 26, 382, 384
- \fontencoding . . . . . 16
- Fonticons (☐) . . . . . 315–318
- Fonticons Fi (☐) . . . . . 315–318
- fontmifz (package) . . . . . 318, 319, 329, 387, 388
- fonts
  - Calligra . . . . . 163
  - Charter . . . . . 32, 65
  - Computer Modern . . . . . 112, 360, 366, 382
  - Computer Modern Sans 360
  - Courier . . . . . 32
  - Emmentaler . . . . . 219
  - Garamond . . . . . 32, 65
  - Helvetica . . . . . 32
  - Palatino . . . . . 360
  - Palladio . . . . . 360
  - Soyombo . . . . . 281
  - Symbol . . . . . 121, 367, 368
  - Times Roman . . . . . 32, 366
  - Type 1 . . . . . 379
  - Utopia . . . . . 32, 65
  - Zapf Chancery . . . . . 163
  - Zapf Dingbats . . . . . 179, 189
- \fontsize . . . . . 366
- fontspec (package) 212, 385, 386
- food . . . . . 284–287
- foot (👣) . . . . . 299
- football . . . . . *see* soccer ball
  - American
    - 🏈 . . . . . 240
    - 🏉 . . . . . 241
    - 🏊 . . . . . 292
- footline (–)<sup>+</sup> *see* turnstile, short bar
- footprints
  - 👣 . . . . . 323–325
  - 👣 . . . . . 299
  - 👣 . . . . . 312
- for all (∀)<sup>+</sup> . . . . . 66, 123–125
- force (↓) . . . . . 171
- fork (🍴) . . . . . 287
- fork and knife
  - 🍴 . . . . . 285
  - 🍴 . . . . . 287
- fork and knife with plate
  - 🍴 . . . . . 285
  - 🍴 . . . . . 287
- Fort Awesome
  - 🏰 . . . . . 315–318
  - 🏰 . . . . . 315–318
- forte (f) . . . . . 219, 232
- fortune (🎰) . . . . . 168
- fortune cookie (🍪) . . . . . 285
- Forumbee (🌀) . . . . . 315–318
- forward composition (•) . . . . . 161
- fountain (🗿) . . . . . 299
- fourier (package) . . . . . 33, 81, 122, 125, 133, 142, 184, 191, 257, 387
- Fourier transform (ℱ) . . . . . *see* alphabets, math
- Foursquare (📍) . . . . . 315–318
- fox (🦊) . . . . . 262
- fractions . . . . . 160
  - one half (½) . . . . . 160, 383
- one quarter (¼) . . . . . 160, 383
- three quarters (¾) 160, 383
- fraktur . . . . . *see* alphabets, math
- frame
  - with picture (🖼) . . . . . 312
  - with tiles (🧩) . . . . . 312
  - with x (🗒) . . . . . 312
- framed picture (🖼) . . . . . 299
- France (🇫🇷) . . . . . 243
- FREE (FREE) . . . . . 299
- free (→)<sup>+</sup> . . . . . 70, 71
  - negated (⇝)<sup>+</sup> . . . . . 72
- Free Code Camp
  - 👤 . . . . . 315–318
  - 👤 . . . . . 318–319
- FreeBSD
  - 🐉 . . . . . 315–318
  - 🐉 . . . . . 318–319
- Freemason’s cipher . . . . . 278
- frege (package) . . . . . 154, 387, 388
- Frege logic symbols . . . . . 111, 125, 153, 154, 160
- Frege, Gottlob . . . . . 153, 154
- french fries
  - 🍟 . . . . . 286–287
  - 🍟 . . . . . 285
  - 🍟 . . . . . 287
- fried shrimp
  - 🍤 . . . . . 285
  - 🍤 . . . . . 287
- frog
  - 🐸 . . . . . 263
  - 🐸 . . . . . 264–267
  - 🐸 . . . . . 262
  - 🐸 . . . . . 268
- frowning (☹)<sup>+</sup> 289, 294, 303, 304
- frowny faces 170, 253, 257, 284, 288–306, 311–312
- frying pan (🍳) . . . . . 288
- fuel pump (🛢) . . . . . 299
- Fulcrum (ψ) . . . . . 315–318
- full note (◦) . . . . . 212
- function
  - composition (◦)<sup>+</sup> . . . . . 37, 39, 46, 160, 161, 193, 194, 370
  - continuous, partial, into multi-function (↦<sup>+</sup>) 113
  - continuous, partial, into multi-map (↗<sup>+</sup>) . . . . . 113
  - continuous, partial, into, grounded multi-function (↗<sup>+</sup>) . . . . . 113

- continuous, partial, into, grounded multi-map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, into, grounded, one-to-one function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, into, grounded, one-to-one map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, into, grounded, singleton function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, into, grounded, singleton map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, into, one-to-one function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, into, one-to-one map ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, partial, into, singleton function ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, partial, into, singleton map ( $\mathfrak{L}\rightarrow$ ) . . 113
  - continuous, partial, onto multi-function ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, partial, onto multi-map ( $\mathfrak{L}\rightarrow$ ) . . . 113
  - continuous, partial, onto, grounded multi-function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, onto, grounded multi-map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, onto, grounded, one-to-one function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, onto, grounded, one-to-one map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, onto, grounded, singleton function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, onto, grounded, singleton map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, onto, one-to-one function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, onto, one-to-one map ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, partial, onto, singleton function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, partial, onto, singleton map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, into, singleton map ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, total, into multi-function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, into multi-map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, into, grounded multi-function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, into, grounded multi-map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, into, grounded, singleton function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, into, grounded, singleton map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, into, one-to-one function ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, total, into, one-to-one map ( $\mathfrak{L}\rightarrow$ ) . . 113
  - continuous, total, into, singleton function ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, total, into, singleton map ( $\mathfrak{L}\rightarrow$ ) . . 113
  - continuous, total, onto multi-function ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, total, onto multi-map ( $\mathfrak{L}\rightarrow$ ) . . . 113
  - continuous, total, onto, grounded multi-function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, grounded multi-map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, grounded, one-to-one function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, grounded, one-to-one map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, grounded, singleton function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, grounded, singleton map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, one-to-one function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, one-to-one map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, singleton function ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, singleton map ( $\mathfrak{L}\rightarrow$ ) . . . . . 113
  - continuous, total, onto, one-to-one function ( $\mathfrak{L}\rightarrow$ ) 113
  - continuous, total, onto, one-to-one map ( $\mathfrak{L}\rightarrow$ ) . . 113
  - continuous, total, onto, singleton function ( $\mathfrak{L}\rightarrow$ ) . . 113
  - continuous, total, onto, singleton map ( $\mathfrak{L}\rightarrow$ ) . . 113
  - converse ( $\otimes$ ) . . . . . 161
  - partial ( $\rightarrow$ )<sup>+</sup> . . . . . 113
  - total ( $\rightarrow$ )<sup>+</sup> . . . . . 113
  - funeral urn ( $\text{☩}$ ) . . . . . 299
  - funnel with dollar ( $\text{☪}$ ) 328–329
  - future ( $\blacktriangleright$ ) . . . . . 51
    - deontic ( $\blacktriangleright$ ) . . . . . 50
    - doxastic ( $\blacktriangleright$ ) . . . . . 51
    - factual ( $\blacktriangleright$ ) . . . . . 51
    - logical ( $\blacktriangleright$ ) . . . . . 52
    - temporal ( $\blacktriangleright$ ) . . . . . 49
- G**
- g . . . . . 23
  - g<sup>+</sup> . . . . . 22, 24, 25, 122
  - Galactic Republic ( $\text{☉}$ ) 315–318
  - Galactic Senate ( $\text{☿}$ ) . 315–318
  - galaxy ( $\text{☄}$ ) . . . . . 279
  - game ( $\text{☺}$ )<sup>+</sup> . . . . . 123, 124
  - game controller *see* video game controller
  - game-related symbols . 233–241, 360–363
  - gamma
    - lowercase ( $\gamma$ )<sup>+</sup> . 20, 22–24, 120, 121
    - lowercase IPA form ( $\gamma$ ) 25
    - lowercase with tail ( $\gamma$ )<sup>+</sup> 23, 24
    - uppercase ( $\Gamma$ )<sup>+</sup> 20, 120, 121
  - Garamond (font) . . . . . 32, 65
  - garlic ( $\text{☪}$ ) . . . . . 285
  - garlic press ( $\text{☪}$ ) . . . . . 288
  - gas pump ( $\text{☎}$ ) . . . . . 323–325
  - gauntlet ( $\text{☞}$ ) . . . . . 200
  - gavel ( $\text{☞}$ ) . . . . . 323–325
  - gear
    - $\text{⚙}$  . . . . . 173–175
    - $\text{⚙}$  . . . . . 171–172
    - $\text{⚙}$  . . . . . 171–172
    - $\text{⚙}$  . . . . . 299
    - multiple ( $\text{⚙}$ ) . . . 328–329
  - gem
    - $\text{💎}$  . . . . . 323–325

-  ..... 299  
 ..... 290  
 Gemini (♊)<sup>+</sup> . . . . . 166–168, 299, 335–338  
 gender signs  
   female (♀)<sup>+</sup> . . . . . 23–24, 166–168, 170, 176, 299, 311–312, 335–338  
   female, filled (♀) . . . . . 176  
   female, without stroke (♀)<sup>+</sup> . . . . . 24, 176  
   female/female (♀)<sup>+</sup> . . . . . 176  
   female/male (♀♂)<sup>+</sup> . . . . . 176  
   male (♂)<sup>+</sup> . . . . . 166–168, 170, 176, 304, 311–312, 335–338  
   male and female (♂♀)<sup>+</sup> . . . . . 176  
   male and female, filled (♂♀) . . . . . 176  
   male with stroke and male and female (♂♀)<sup>+</sup> 176, 300  
   male, extra stroke (♂<sup>+</sup>)<sup>+</sup> 176  
   male, filled (♂) . . . . . 176  
   male/male (♂♂)<sup>+</sup> . . . . . 176  
   neuter (♁)<sup>+</sup> . . . . . 176  
 genealogical symbols . . . . . 253  
 genie (🧞)<sup>+</sup> . . . . . 299, 303, 304  
 gensymb (package) . . . . . 164  
 Gentoo (🐧) . . . . . 318–319  
 geographical symbols . . . . . 242–252  
 geometric proportion (≐)<sup>+</sup> . *see* minus, dots  
 geometric shapes . . . . . 48–52, 168, 192–197, 225–230, 240, 333–334, 358–359  
 geometrically equal to (≐) . *see* equal, dots  
 geometrically equivalent to (≐) . . . . *see* equal, bump  
 Germanic runes . . . . . 211  
 Germany (🇩🇪) . . . . . 243  
 gesturing NO (🙅)<sup>+</sup> 294, 303, 304  
 gesturing OK (🙏)<sup>+</sup> 294, 303, 304  
 GG  
    . . . . . 315–318  
    . . . . . 315–318  
 ghost . . . 52, 150, 277, 315–318, 322–325  
    . . . . . 331  
    . . . . . 329  
    . . . . . 299  
    . . . . . 312  
   as math-mode accent (̂)<sup>+</sup> . . . . . *see* accents, ghost  
   math mode  
      . . . . . 52  
      . . . . . 52  
      . . . . . 52  
 Gibbons, Jeremy . . . . . 390  
 gift  
    . . . . . 321  
    . . . . . 323–325  
    . . . . . 322  
    . . . . . 304  
    . . . . . 312  
 gimel (ג)<sup>+</sup> . . . . . 122, 123  
 GINETEX laundry symbols 257  
 giraffe  
    . . . . . 264–267  
    . . . . . 264–267  
    . . . . . 264–267  
    . . . . . 262  
   multiple (🦒) . . . . . 264–267  
 girl  
    . . . . . 299  
    . . . . . 307  
 Git  
    . . . . . 315–318  
    . . . . . 315–318  
   git . . . . . 315–318  
    . . . . . 318–319  
 GitHub  
    . . . . . 315–318  
    . . . . . 315–318  
    . . . . . 315–318  
    . . . . . 314  
    . . . . . 314  
    . . . . . 314  
    . . . . . 315–318  
    . . . . . 315–318  
   Gitter (🗨️) . . . . . 315–318  
 glass  
    . . . . . 323–325  
    . . . . . 323–325  
    . . . . . 323–325  
    . . . . . 325–327  
    . . . . . 285  
 glasses  
   clinking (🥂)<sup>+</sup> . . . . . 284  
 Gleich Stark (⚖️) . . . . . 77  
 Glide  
    . . . . . 315–318  
    . . . . . 315–318  
 globe . . . 257, 290–305, 312–314, 322, 328–329  
    . . . . . 257  
    . . . . . 322  
    . . . . . 322  
    . . . . . 322  
   showing Africa (🌍) 328–329  
   showing Americas (🌎)<sup>+</sup> 299, 312, 328–329  
   showing Asia (🌏) . . . . . 328  
   showing Asia-Australia (🌐)<sup>+</sup> . 300, 312, 328–329  
   showing Europe (🌐) . 328–329  
   showing Europe-Africa (🌐)<sup>+</sup> . . . . . 300, 312, 328–329  
   with meridians (🌐)<sup>+</sup> . 300, 312, 328–329  
 glottal stop (ʔ)<sup>+</sup> . . . . . 22, 24, 25  
   barred (ʔ̄) . . . . . 22  
   inverted (ʔ̅)<sup>+</sup> . . . . . 22, 24  
   inverted, barred (ʔ̅̄) . . . . . 22  
   inverted, reversed (ʔ̅̅) . . . . . 24  
   inverted, with tail (ʔ̅̅̅) . . . . . 23  
   raised (ʔ̈)<sup>+</sup> . . . . . 23  
   reversed (ʔ̅)<sup>+</sup> . . . . . 23, 25  
   reversed, barred (ʔ̅̄) . . . . . 22  
 gloves  
    . . . . . 325–327  
    . . . . . 300  
 gluon . . . . . 164, 177–178  
   *g* . . . . . 177  
    . . . . . 164  
 gnat (🪰) . . . . . 264–267  
 Gnome (🐹) . . . . . 318–319  
 go (package) . . . . . 240, 387  
 Go gopher  
    . . . . . 318–319  
    . . . . . 318–319  
 Go stones . . . . . 240  
   circle (⦿)<sup>+</sup> . . . . . 240  
   cross (⊗)<sup>+</sup> . . . . . 240  
   empty (●)<sup>+</sup> . . . . . 240  
   square (⊞)<sup>+</sup> . . . . . 240  
   triangle (⊠)<sup>+</sup> . . . . . 240  
 go up (📈) . . . . . 208–210  
 goad  
    . . . . . 201  
    . . . . . 201  
 goal net (🥅) . . . . . 300

goat  
 ..... 343–346  
 ..... 206  
 ..... 262  
 ..... 268  
goban ..... 240  
goblet (👉) ..... 206  
goblin  
 ..... 300  
 ..... 307  
god (👤) ..... 208–210  
Gofore (👤) ..... 315–318  
goggles (👓) ..... 300  
gold (👑) ..... 206  
golf ball (🏌️) ..... 240  
golf hole with flag (🏌️) ..... 299  
golfing (🏌️)<sup>+</sup> 241, 294, 303, 304  
good (👍) ..... 201  
Goodreads  
 ..... 315–318  
 ..... 315–318  
Google  
 ..... 315–318  
 ..... 318–319  
 ..... 318–319  
Google Code (👤) ..... 318–319  
Google Developers (👤) 318–319  
Google Drive (👤) ..... 315–318  
Google Pay (👤) ..... 315–318  
Google Play (👤) ..... 315–318  
Google Scholar  
 ..... 330–331  
 ..... 330–331  
Google Wallet (👤) ..... 315–318  
Google+  
 ..... 315–318  
 ..... 315–318  
 ..... 315–318  
 ..... 314  
 ..... 314  
goose (👤) ..... 264–267  
gopuram (👤) ..... 310  
gorilla (👤) ..... 262  
governor (👤) ..... 208–210  
Gradle (👤) ..... 318–319  
graduation cap *see* mortarboard  
Grails  
 ..... 318–319  
 ..... 318–319  
grapes  
 ..... 285

 ..... 287  
graphene (👤) ..... 177  
graphics (package) ..... 148, 368  
graphicx (package) 30, 366, 368, 372  
grasshopper (👤) .. 264–267  
grater  
 ..... 200  
 ..... 288  
Gratipay (👤) ..... 315–318  
Grav (👤) ..... 315–318  
grave (👤)<sup>+</sup> *see* accents, grave  
gravestone (👤) ..... 300  
graviton (g) ..... 177  
Great Britain (👤) ..... 243  
greater than (>)<sup>+</sup> 19, 87, 88, 91, 381, 382  
arrow (≥) ..... 89  
but not approximately equal to (≈)<sup>+</sup> ..... 85–90  
but not equal to  
 ..... 85, 86, 89, 90  
 ..... 85–90  
 ..... 85, 86, 88–90  
but not similar to (≈)<sup>+</sup> 85–90  
circle (⊃)<sup>+</sup> ..... 89, 90  
closed  
 ..... 87, 88, 92, 93  
 ..... 88–90  
closed, negated  
 ..... 87, 88, 92, 93  
 ..... 88  
decorative (➤) ..... 157  
dotted (>)<sup>+</sup> 41, 69, 85–89  
dotted, negated (≧)<sup>+</sup> 87, 88  
horizontally barred (➤) 90  
much  
 ..... 85–88, 90, 160  
 ..... 86, 89, 90  
much, negated (≧)<sup>+</sup> 86–88, 90  
negated (≧)<sup>+</sup> ..... 85–91  
or approximately equal to (≈)<sup>+</sup> ..... 85–89  
or approximately equal to, negated (≈)<sup>+</sup> ..... 86, 88  
or equal to  
 ..... 85–90  
 ..... 85–91, 373  
 ..... 85–88, 90, 91  
 ..... 90  
 ..... 154

 ..... 157  
or equal to or less than  
 ..... 85–89  
 ..... 85–90  
 ..... 87–89  
 ..... 90  
or equal to or less than, negated  
 ..... 87, 88  
 ..... 87, 88  
 ..... 87–89  
or equal to, closed  
 ..... 87, 88, 92, 93  
 ..... 88, 90  
or equal to, closed, negated  
 ..... 87, 88, 92, 93  
 ..... 88, 89  
or equal to, decorative (≧) ..... 157  
or equal to, dotted  
 ..... 87–90  
 ..... 87, 88  
 ..... 90  
 ..... 90  
or equal to, dotted, negated  
 ..... 87, 88  
 ..... 87–89  
or equal to, horizontally barred (≧) ..... 90  
or equal to, negated  
 ..... 85–90  
 ..... 85–91  
 ..... 85–91  
or less than  
 ..... 85–90  
 ..... 90  
or less than but not equal to (≧) ..... 87  
or less than or equal to (≧) ..... 90  
or less than, negated (≧)<sup>+</sup> ..... 86–88, 90  
or less than, overlapping (≧)<sup>+</sup> ..... 89, 90  
or similar to  
 ..... 85–90, 372  
 ..... 373  
or similar to or equal to (≧) ..... 90  
or similar to or less than (≈) ..... 90  
or similar to, negated (≈)<sup>+</sup> ..... 86, 88, 90









































































































question mark (¿) . . . 89  
 very much  
     >>>+ . . . 85, 87–90, 365  
     >>> . . . . . 90  
 very much, negated (>>>)+  
     . . . . . 87, 88  
 Greece (€) . . . . . 243  
 Greek  
     blackboard bold . . . . . 163  
     bold . . . . . 120, 380  
     letters . . 20, 120–122, 163,  
         208, 380  
     numerals . . . . . 208  
     polytonic . . . 20, 120, 121  
     upright . . . . . 20, 121  
 Green Dot (♻️)+ . *see* recycling  
 greenpoint (package) . . 332, 387  
 Gregorian music . . . . . 215  
 Gregorio, Enrico . 136, 369, 370  
 grid  
     bottom (⊥) . . . . . 240  
     center (⊕) . . . . . 240  
     center, with filled circle (⊕)  
         . . . . . 240  
     left (⊥) . . . . . 240  
     right (⊥) . . . . . 240  
     top (⊥) . . . . . 240  
 grid, large (▣) . . . . . 173–175  
 grid, small (▣) . . . . . 173–175  
 Griffith’s separation vector (s) .  
     . . . . . 163  
 Grim Reaper (☠️) . . . . . 288  
 grip  
     lines  
         || . . . . . 173–175  
         = . . . . . 173–175  
     squares  
         ▣ . . . . . 173–175  
         ▣ . . . . . 173–175  
 Gripfire (🔥) . . . . . 315–318  
 group (👥)+ . . . . . 171–172  
 group meeting (👥) . . . . . 307  
 group objects  
     👥 . . . . . 173–175  
     👥 . . . . . 173–175  
 Grüne Punkt (♻️)+ *see* recycling  
 Grunt (🐷)+ . . . . . 315–319  
 guarani (₲) . . . . . 31  
 guard (🚫)+ . 300, 303, 304, 307  
 guide dog (🦮) . . . . . 263  
 Guilded (👑) . . . . . 315–318  
 guillemet  
     decorative left single (◀) 199






































































































decorative right single (▶) .  
     . . . . . 199  
 left (◀) . . . . . 21, 383  
 left single (◁) . . . . . 21, 384  
 right (▶) . . . . . 21, 383  
 right single (▷) . . . 21, 384  
 guise (👤) . . . . . 208–210  
 guitar  
     🎸 . . . . . 323–325  
     🎸 . . . . . 300  
     🎸 . . . . . 313  
 Gulp  
     👤 . . . . . 315–318  
     👤 . . . . . 318–319  
     👤 . . . . . 318–319  
 gun (🔫) . . . . . *see* pistol

**H**

H (H) . . . . . 328–329  
 Hälsinge runes . . . *see* staveless  
     runes  
 háček (ˇ)+ . . *see* accents, caron  
 Hacker News (👩)+ . . 315–318  
 HackerRank (👩) . . . . 315–318  
 Hades (👤) . . . . . 168  
 Hadoop (👤) . . . . . 318–319  
 hail (🌨️) . . . . . 258  
 hair  
     👤 . . . . . 296  
     👤 . . . . . 296  
     👤 . . . . . 302  
 haircut (👤) . . . . . 307  
 HAL  
     👤 . . . . . 330–331  
     👤 . . . . . 330–331  
 half note (♩)+ . . . 212, 215–218  
     dotted (♩)+ . . . . 216–218  
     double dotted (♩)+ . 217,  
         218  
     rest (—)+ . . . . . 215, 219  
     rest, dotted (—.) . . . 219  
 halfnoteize (👤) . . . . . 314  
 hallow (👤) . . . . . 208–210  
 Halloween symbols . . . . 52, 150  
 halloweenmath (package) . . 52,  
     117, 138, 148–150, 387, 388  
 Hamburg Notation System 272–  
     275  
 hamburger  
     🍔 . . . . . 323–325  
     🍔 . . . . . 286–287  
     🍔 . . . . . 285

👤 . . . . . 287  
 Hamiltonian (ℋ) *see* alphabets,  
     math  
 hammer  
     🔨 . . . . . 323–325  
     🔨 . . . . . 300  
     🔨 . . . . . 313  
     and pick (🔨) . . . . . 300  
     and sickle (🔨) . . . . . 333  
     and wrench  
         🔨 . . . . . 254  
         🔨 . . . . . 300  
 hamnosys (package) . . 272–275,  
     387, 388  
 hamsa (👤) . . . . . 310  
 hamster (🐹)+ . . . . . 263, 268  
 hand 184–186, 274, 332, 343–346  
     👤 . . . . . 325–327  
     👤 . . . . . 201  
     👤 . . . . . 201  
     👤 . . . . . 296  
     👤 . . . . . 296  
     👤 . . . . . 185  
     call me (👤) . . . . . 294  
     crossed fingers (👤) . . . 296  
     fingers splayed  
         👤 . . . . . 185  
         👤 . . . . . 185  
         👤 . . . . . 300  
     fist  
         👤 . . . . . 185  
         👤 . . . . . 185  
         👤 . . . . . 186  
         👤 . . . . . 293  
         👤 . . . . . 296  
         👤 . . . . . 297  
         👤 . . . . . 303  
     holding dollar sign (👤) 186  
     holding heart (👤) . . . 186  
     holding medical sign (👤) .  
         . . . . . 186  
     holding position (👤) . 186  
     holding water (👤) . . . 186  
     horns (👤) . . . . . 298  
     lizard sign (👤)+ . . . . 186  
     love-you sign (👤) . . . . 304  
     middle finger extended  
         👤 . . . . . 185  
         👤 . . . . . 186  
         👤 . . . . . 292  
     OK sign  
         👤 . . . . . 185  
         👤 . . . . . 185

	185		185		304
	293		186	handbag	
paper sign (👉) <sup>+</sup>	186		186		300
peace sign	<i>see hand,</i>		186		281
victory sign			186	handball (🎱) <sup>+</sup>	291, 295, 303
pinching			186	hands (👐)	186
	295		293	clapping	
	295		301		185
pointing down		pointing upper left			295
	185		184	helping (👏)	186
	185		184	open	
	185	pointing upper right			185
	185		184		293
	185		184	palms up (👐)	294
	185	rock sign (👊) <sup>+</sup>	186	praying	
	186	scissors sign (✂️) <sup>+</sup>	186		299
	186	sparkles (✨)	186		310
	292	Spock sign (🖖) <sup>+</sup>	185, 186, 301	raising (🙌)	296
pointing left		thumbs down		washing (🧼)	186
	184		184	handshake	
	184		184		186
	184		185		186
	185		185		300
	185		185	slashed (🚫) <sup>+</sup>	186
	185		186	hanger (⚙️)	321
	185		186	happy person raising one hand	
	185		186	(🙌)	289
	185		300	hard disk (💾)	314
	186	thumbs up		hard sign (⚡)	22
	186		184	harmony (package)	215, 217, 387, 388
	293		184	harp (🎹)	343–346
pointing right			184	harpoon (package)	148, 387, 388
	184		185	harpoon (→) <sup>+</sup>	94–96, 99, 100, 104, 105, 107, 110–112, 114, 148, 358–359
	184		185	barred head (↔) <sup>+</sup>	110
	184		185	barred tail (↔) <sup>+</sup>	110
	184		185	barred, parallel (⇔) <sup>+</sup>	96, 110
	184		186	double ended, opposite sides	
	185		186	(↔) <sup>+</sup>	96, 99, 104, 110, 111
	185		186	double ended, opposite sides, extensible (↔) <sup>+</sup>	148
	185		186	double ended, opposite sides, long (↔) <sup>+</sup>	111
	185		301	double ended, opposite sides, negated (↔) <sup>+</sup>	100, 105
	185	victory sign		double ended, same side	
	185		185	(↔) <sup>+</sup>	110
	185		185	double, opposite sides (⇔) <sup>+</sup>	94–96, 99, 104, 107, 110
	186		186		
	186		301		
	257	Vulcan salute	<i>see hand,</i>		
	293	Spock sign			
pointing up		waving			
	185		185		
	185		301		
	185	with eye (👁️)	<i>see hamsa</i>		
	185	writing			
	185		184		
	185		185		
	185		185		
	185		257		

- double, opposite sides, extensible
  - + . . . . . 145, 146
  - + . . . . . 146
- double, opposite sides, negated ( $\neq$ )<sup>+</sup> . . . 100, 105
- double, same side ( $\Rightarrow$ )<sup>+</sup> 96, 110
- extensible ( $\dashrightarrow$ )<sup>+</sup> . 145, 148
- long ( $\longrightarrow$ )<sup>+</sup> . . . . . 111, 112
- negated ( $\nrightarrow$ )<sup>+</sup> . . . 100, 105
- hash
  - #<sup>+</sup> . . . . . 18, 37, 76, 158, 173–175, 381
  - #<sup>+</sup> . . . . . 76, 158
  - # . . . . . 302
- Haskell () . . . . . 318–319
- hat
  -  . . . . . 325–327
  -  . . . . . 325–327
  -  . . . . . 304
  -  . . . . . 281
  - accent ()<sup>+</sup> . . *see* accents, circumflex
  - as math-mode accent
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
    -  . . . . . 138
  - cowboy
    -  . . . . . 323–325
    -  . . . . . 323
  - hard () . . . . . 323–325
  - top
    -  . . . . . 300
    -  . . . . . 313
  - witch () . . . . . 331
  - wizard () . . . . . 323–325
- hatching chick
  -  . . . . . 263
  -  . . . . . 268
- Hausa letters . . *see* boko letters
- head
  -  . . . . . 257
  -  . . . . . 201
  -  . . . . . 201
- heading (**H**) . . . . . 173–175
- headphones
  -  . . . . . 323–325
  -  . . . . . 322
  -  . . . . . 300
  -  . . . . . 313
- headset () . . . . . 323–325
- headstone () . . . . . 300
- health worker ()<sup>+</sup> . . . 300, 303, 304
- heart ()<sup>+</sup> . 168, 198, 233, 234, 257, 269, 290–305, 311–314, 319, 328–329
  - anatomical () . . . . . 292
  - beating
    -  . . . . . 290
    -  . . . . . 293
  - black () . . . . . 293
  - blue () . . . . . 294
  - broken
    -  . . . . . 290
    -  . . . . . 294
    -  . . . . . 328–329
  - brown () . . . . . 294
  - exclamation point
    -  . . . . . 199
    -  . . . . . 300
  - filled ()<sup>+</sup> . . . . . 199, 290, 328–329
  - floral () . . . . . 199
  - framed
    -  . . . . . 290
    -  . . . . . 300
  - green () . . . . . 300
  - growing
    -  . . . . . 290
    -  . . . . . 300
  - half filled () . . . . . 328
  - halftoned
    -  . . . . . 290
    -  . . . . . 290
    -  . . . . . 290
    -  . . . . . 290
  - multiple ()<sup>+</sup> . . . 290, 301
  - multiple, revolving
    -  . . . . . 290
    -  . . . . . 297
- orange () . . . . . 294
- purple () . . . . . 296
- red ()<sup>+</sup> . . . 296, 311–312
- rotated () . . . . . 199
- rotated floral () . . . 199
- sparkling
  -  . . . . . 290
  -  . . . . . 299
- suit *see* playing card suits, heart
- white () . . . . . 302
- with arrow
  -  . . . . . 290
  -  . . . . . 300
- with ribbon
  -  . . . . . 290
  -  . . . . . 300
- with tip on the left () 290
- yellow () . . . . . 304
- heartbeat () . . . . . 319
- heavy left-pointing angle bracket ornament () . . . . . 199
- heavy right-pointing angle bracket ornament () 199
- Hebrew . . . . . 122, 123, 163
- hedgehog () . . . . . 263
- helicopter . . . . . 254, 320
  -  . . . . . 320
  -  . . . . . 323–325
  -  . . . . . 325–327
  -  . . . . . 321
  -  . . . . . 254
- helmet
  -  . . . . . 200
  -  . . . . . 201
  -  . . . . . 201
- help sign () . . . . . 271
- Helvetica (font) . . . . . 32
- hemiobelion (c) . . . . . 32
- heraldry () . . . . . 275
- herb
  -  . . . . . 300
  -  . . . . . 281
- hermaphrodite ()<sup>+</sup> *see* gender signs, male and female
- Hermitian conjugate matrix (+)<sup>+</sup> . . . . . 159
- Heroku (**H**) . . . . . 318–319
- herring () . . . 264–267
- heta
  - lowercase (*h*) . . . . . 208
  - uppercase (*H*) . . . . . 208



heterosexual (♂)<sup>+</sup> . . . *see* gender signs, female/male

hexagon (◻)<sup>+</sup> 192–194, 196–197

crossed (⊗) . . . . . 197

dotted (⊙) . . . . . 197

filled (●)<sup>+</sup> . . . 193, 194, 197

half filled

◐ . . . . . 197

◑ . . . . . 197

◒ . . . . . 197

◓ . . . . . 197

horizontally divided (⊖) 197

quartered (⊕) . . . . . 197

vertically divided (⊗) . . . 197

with chemical bonds (⊞) . . . . . 194

hhcount (package) 236, 268, 387, 388

hibiscus

🌺 . . . . . 300

🌻 . . . . . 281

Hidalgo (℥) . . . . . 168

hidden universal bunch quantifier (∇) . . . . . 125

hidden universal individual quantifier (∇) . . . . . 125

hide

👁️ . . . . . 200

👁️ . . . . . 173–175

👁️ . . . . . 173–175

hieroglf (package) 202, 387, 388

hieroglyphics . . . . . 202

high brightness (⚡) . . . . . 256

high frequency (≈) . . . . . 164

high voltage (⚡) . . . . . 301

hiking (🧑🏞️) . . . . . 328–329

Hilbert space (ℋ) *see* alphabets, math

hindu temple (🕌) . . . . . 301

hippopotamus

🐘 . . . . . 263

🐘 . . . . . 264–267

🐘 . . . . . 263

HIPS (hips) . . . . . 315–318


Hire a Helper (👷) . . . . . 315–318

Hirst, Daniel . . . . . 212

history (📖) . . . . . 173–175

Hive (🐝) . . . . . 315–318

Hochschule Bochum (BO) . . . 257

landscape  BO) . . . 257

portrait (BO) . . . . . 257

hockey puck (🏒) . . . . . 240

hole

h<sup>+</sup> . . . . . 177

◌ . . . . . 301


◌ . . . . . 314

holly berry (🌿) . . . . . 328–329

Holmes, Sherlock . . . . . 355

Holt, Alexander . . . . . 1, 386

holtipolt (package) . . . 151, 387

 Homer ( ) . . . . . 306

homosexual (♂)<sup>+</sup> . . . *see* gender signs, male/male

honey pot

🍯 . . . . . 285

🍯 . . . . . 287

honeybee

🐝 . . . . . 263

🐝 . . . . . 268

hook (🪝) . . . . . 301

hooked letters

a (a) . . . . . 24

b

ḅ . . . . . 22

ḅ . . . . . 24

ḅ . . . . . 25

c

ċ . . . . . 22

ċ . . . . . 25

d

ḏ . . . . . 22

ḏ . . . . . 24

ḏ . . . . . 24

ḏ . . . . . 24

ḏ . . . . . 25

ḏ . . . . . 25

ḏ . . . . . 25

e (e) . . . . . 24

g

ḡ . . . . . 22

ḡ . . . . . 24

g, small caps (ḡ) . . . . . 22

h

ḥ . . . . . 22

ḥ . . . . . 24

ḥ . . . . . 25

i (i) . . . . . 23

i, long (ı) . . . . . 22

j, dotless, barred

ḵ . . . . . 22

ḵ . . . . . 23

k (k)<sup>+</sup> . . . . . 22, 25

n (n) . . . . . 24

o, open (ø) . . . . . 24

p

ḑ . . . . . 22

p . . . . . 23

ḑ . . . . . 25

q (q) . . . . . 22

t

ṭ . . . . . 22

ṭ . . . . . 22

ṭ . . . . . 24

ṭ . . . . . 25

y, long (ȳ) . . . . . 22

Hooli (🐼) . . . . . 315–318

horizontal line

dashed (--) . . . . . 182

high (—)<sup>+</sup> . . . . . 194, 195

low (—) . . . . . 198

middle (—)<sup>+</sup> . . . . . 70, 159

middle, double (=) . . . 70

middle, double, slashed (≠)<sup>+</sup> . . . . . 23, 72

middle, slashed (+) . . . 72

middle, with vertical line (+) . . . . . 198

horn (🐄) . . . . . 200

Horn, Berthold . . . . . 163

Hornbill (🐘) . . . . . 315–318

horned letters

O (O) . . . . . 21

o (o) . . . . . 21

U (U) . . . . . 21

u (u) . . . . . 21

horoscope symbols . . . 166–168, 335–338

horse

🐎 . . . . . 263

🐎 . . . . . 263

🐎 . . . . . 264–267

🐎 . . . . . 264–267

🐎 . . . . . 343–346

🐎 . . . . . 206

🐎 . . . . . 263

🐎 . . . . . 268

🐎 . . . . . 268

carousel

🎠 . . . . . 294

















































































🎠 . . . . . 313















racing







































🏇 . . . . . 241

🏇 . . . . . 262

🏇 . . . . . 301

- hospital  
 ..... 319  
 ..... 319  
 ..... 301  
 ..... 314  
hospital sign (Ⓜ) ..... 271  
hot air balloon  
 ..... 315–318  
 ..... 325–327  
hot beverage (☕) ..... 284  
hot dog  
 ..... 323–325  
 ..... 284  
 ..... 287  
hot pepper  
 ..... 323–325  
 ..... 284  
 ..... 287  
hot springs (♨) ..... 301  
hot tub (♨) ..... 323–325  
hotel  
 ..... 323–325  
 ..... 301  
 ..... 314  
love  
 ..... 304  
 ..... 314  
Hotjar (🔥) ..... 315–318  
hourglass  
 ..... 41  
 ..... 47  
 ..... 47  
 ..... 261  
 ..... 261  
 ..... 261  
 ..... 261  
 ..... 261  
 ..... 261  
 ..... 261  
house  
 ..... 193  
 ..... 323–325  
 ..... 325–327  
 ..... 325–327  
 ..... 325–327  
 ..... 325–327  
 ..... 201  
 ..... 201  
 ..... 322  
 ..... 301  
 ..... 314  
damaged (🏠) .. 328–329  
derelict (🏚️)<sup>+</sup> .. 297, 313  
multiple (🏚️)<sup>+</sup> .. 301, 313  
with garden (🏡)<sup>+</sup> 301, 314  
houses of worship 310, 333–334  
Houzz (🏠) ..... 315–318  
hryvnia (₴) ..... 32  
HTML  
 ..... 318–319  
 ..... 171–172  
HTML5  
 ..... 318–319  
 ..... 318–319  
HubSpot (🌐) ..... 315–318  
hummingbird (🐦) 264–267  
hundred points  
 ..... 301  
 ..... 313  
Hungary (🇭🇺) ..... 244  
hut  
 ..... 259  
 ..... 259  
 ..... 259  
 ..... 301  
hwemoji (package) 234, 252, 258, 261, 263, 278, 283, 285, 305, 321  
Hygieia (🐍) ..... 168  
hyphen  
discretionary ..... 382  
double (=) ..... 34  
Hypothesis  
 ..... 330–331  
 ..... 330–331  
I  
i  
dotless (ı)<sup>+</sup> ..... 25, 26  
dotless, math mode (ı)<sup>+</sup> ..  
..... 123, 124, 136  
incorrectly accented (ï) 26  
Lidingö/Viby (ı)<sup>+</sup> .. 23  
I cursor (⌘) ..... 173–175  
IBM PC ..... 276, 382  
IBM PC symbols ..... 170  
ice (🧊) ..... 284  
ice cream  
 ..... 323–325  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 285  
 ..... 284  
 ..... 287  
 ..... 287  
ice hockey stick and puck  
 ..... 301  
 ..... 241  
ice skate (🛷) ..... 301  
Iceland (🇮🇸) ..... 244  
Icelandic staves ..... 276  
icicles (🧊) ..... 259  
icons (📁) ..... 173–175  
icosahedron (🔺) ... 311–312  
ID (🆔) ..... 301  
ID badge  
 ..... 328–329  
 ..... 328–329  
ID card  
 ..... 328–329  
 ..... 328–329  
Ideal (🏆) ..... 315–318  
IDEASRePEc  
 ..... 330–331  
 ..... 330–331  
IEEE  
 ..... 330–331  
 ..... 330–331  
iff (⇔)<sup>+</sup> .. see arrow, double ended, double bodied  
ifsym (package) . 164, 194, 195, 236, 258–260, 268, 270, 365, 367, 387, 388  
igloo (🏠) ..... 323–325  
igo (package) ..... 240, 387  
image  
 ..... 173–175  
 ..... 173–175  
 ..... 171–172  
 ..... 171–172  
images  
 ..... 173–175

 ..... 173–175  
 imaginary  
    $\Im$  ..... 119, 123  
   j ..... 124  
    $\mathfrak{I}$  ..... 124  
 IMDb () ..... 315–318  
 immigration ..... 254  
 imp () ..... 307  
 Impactstory  
    ..... 330–331  
    ..... 330–331  
 implication  $(\rightarrow)^+$  ... 113, 114  
   intuitionistic  $(\rightarrow)^+$  ... 114  
   material  $(\Rightarrow)^+$  ..... 113  
   not  $(\not\rightarrow)^+$  ..... 114  
   not classical  $(\not\rightarrow)$  ..... 81  
   not intuitionistic  $(\not\rightarrow)^+$  115  
   not material  $(\not\Rightarrow)^+$  ... 114  
   not weak  $(\not\rightarrow)^+$  ..... 115  
   not weak material  $(\not\Rightarrow)^+$  115  
   weak  $(\longrightarrow)^+$  ..... 114  
   weak material  $(\Longrightarrow)^+$  114  
 impulse train ..... *see sha*  
 imum celi ( $\mathbb{E}$ ) ..... 168  
 in  $(\in)^+$  ... *see set membership*  
 inbox  
    ..... 173–175  
    ..... 301  
    ..... 312  
 inches  
   " ..... *see prime, double*  
   "<sup>+</sup> ... *see quotation marks, straight double*  
 incoherence  $(\asymp)^+$  *see smiles and frowns, both*  
 increase font size ( $\mathbf{AA}$ ) ... 313  
 indent ( $\mathbb{E}$ ) ..... 173–175  
 independence  
    $\perp^+$  ... *see turnstile, double dash, up*  
    $\perp^+$  ... *see turnstile, up*  
 industry  
    ..... 257  
    ..... 328–329  
 inexact differential ( $\mathfrak{d}$ )<sup>+</sup> ... *see barred letters, d*  
 infant ..... *see baby*  
 infinity ..... 155, 157–160, 371  
    $\infty^+$  ... 155, 157–159, 161  
    ..... 157  
    ..... 156  
    ..... 156  
    ..... 301  
 incomplete  $(\omega)^+$  155, 159  
 negated  $(\phi)$  ..... 155

tie over ( $\infty$ ) ..... 155  
 information  
    ..... 257  
    ..... 271  
    ..... 311–312  
    ..... 281  
    ..... 173–175  
    ..... 173–175  
    ..... 171–172  
    ..... 171–172  
    ..... 171–172  
    ..... 171–172  
    ..... 301  
 information desk person () 307  
 informant symbols ..... 239  
 Innosoft () ..... 315–318  
 INPN  
    ..... 330–331  
    ..... 330–331  
 input type  
   Latin lowercase  
      ..... 301  
      ..... 301  
      ..... 313  
   Latin uppercase  
      ..... 301  
      ..... 313  
      ..... 313  
   numbers  
      ..... 301  
      ..... 313  
   symbols  
      ..... 301  
      ..... 313  
 inputenc (package) ..... 385  
 insect  
    ..... 263  
    ..... 262  
    ..... 262  
    ..... 262  
    ..... 262  
    ..... 268  
 Inspire  
    ..... 330–331  
    ..... 330–331  
 Instagram  
    ..... 315–318  
    ..... 315–318  
    ..... 314  
    ..... 314  
 InstaLOD () ..... 315–318  
 integers ( $\mathbb{Z}$ ) *see alphabets, math*  
 integral  $(\int)^+$  . . . 53–66, 158, 159, 371

around a point operator  
    $(\oint)^+$  ..... 53, 61, 63, 64  
 bar  $(f)^+$  53, 60, 61, 63, 64, 66, 371  
 big  $(\int)^+$  ..... 58  
 circulation function  $(f)^+$  53, 61, 63, 64  
 clockwise  $(f)^+$  . . . 53, 60–62, 65  
 clockwise contour  $(\oint)^+$  53, 54, 56–62, 64, 65  
 closed surface  $(\oint)^+$  . . . 53, 55–57, 59, 61, 62, 64, 65  
 closed volume  $(\iiint)^+$  53, 56, 57, 59, 61, 62, 64, 65  
 contour  $(\oint)^+$  ..... 53–65  
 counterclockwise  $(f)^+$  . . . 53, 60, 61, 63, 64  
 counterclockwise contour  $(\oint)^+$  . . . 53, 56–62, 64, 65  
 dotted  $(f \cdots f)^+$  54, 56–58, 60, 64, 65  
 double  $(\iint)^+$  53–58, 60–62, 65  
 double bar  $(\mathcal{f})^+$  53, 60, 61, 63, 371  
 hooked arrow  $(\mathcal{f})^+$  53, 61, 63, 65  
 intersection  $(\oint)^+$  53, 61, 63, 65  
 Landau down  $(\mathcal{f})^+$  57, 58, 60, 65  
 Landau up  $(\mathcal{f})^+$  57–60, 65  
 line not including the pole  $(\mathcal{f})^+$  ..... 53, 62–64  
 line with rectangular path around pole  $(\mathcal{f})^+$  53, 61, 63, 64  
 line with semicircular path around pole  $(\mathcal{f})^+$  53, 61, 63, 64  
 multiple  $(\iiint)$  ..... 66  
 multiple, contour  $(\iiint)$  66  
 multiple, square  $(\iiint)$  66  
 overbar  $(\overline{\int})^+$  . . . 53, 54, 61–65  
 product  $(\prod)^+$  ..... 66  
 quadruple  $(\iiint)^+$  . . . 53, 54, 56–58, 60, 61, 63, 64  
 quaternion . . . *see integrals, square*  
 slash  $(f)^+$  ..... 53, 56, 57, 59–61, 63, 64

square (♯)<sup>+</sup> 53, 54, 56, 57, 61, 63, 65  
 square, double (⦿)<sup>+</sup> . . . 56, 57, 65  
 square, triple (⦿⦿) . . . 56  
 sum (⌘)<sup>+</sup> 53, 54, 59–62, 65  
 times (×)<sup>+</sup> . 53, 61, 63, 65  
 triple (⦿⦿⦿)<sup>+</sup> 53–58, 60–62, 64  
 underbar (ℓ)<sup>+</sup> . 53, 61, 64  
 union (∪)<sup>+</sup> . 53, 61, 63, 65  
 interaction (⚡) . . . . . 177  
 intercalate (⌞)<sup>+</sup> . 38, 40–42, 124  
 Intercom (🗣️) . . . . . 315–318  
 interior (⏸️)<sup>+</sup> . *see* accents, ring  
 interior product (⋅)<sup>+</sup> *see* logical negation, inverted  
 interleave (⏪⏩)<sup>+</sup> 38, 42, 54, 159  
 internal (🔒) . . . . . 177  
 Internet Explorer (🌐) 315–318  
 interrobang (‽) . . . . . 34  
     inverted (‿) . . . . . 34  
 intersection (∩)<sup>+</sup> 37, 39–42, 54, 58, 59, 61, 161  
     bar (∩̄) . . . . . 42  
     bar, union (∩̄∪) . . . . . 42  
     closed (∩) . . . . . 42  
     dotted (∩<sup>⋯</sup>) 39, 40, 42, 58, 59  
     double (∩∩)<sup>+</sup> . . . . . 38–43  
     over union (∩̅) . . . . . 42  
     plus (∩<sup>+</sup>) 38–40, 42, 54, 58, 59  
     square (∩)<sup>+</sup> 37, 39, 40, 42, 43, 54, 55, 58, 60, 61, 161  
     square, double (∩∩)<sup>+</sup> 39–41, 43  
     square, half  
         ┌ . . . . . 39  
         ┐ . . . . . 40  
     square, plus (∩<sup>+</sup>) . 39, 40, 56, 58, 60  
     two adjacent (∩∩) . . . . 42  
     vertical line (∩) . . . . . 77  
     wedge (∩) . . . . . 42  
 inverse limit (lim) . . . . . 119  
 inverted letters . . . 22–25, 125  
     a (α) . . . . . 23  
     a, small caps (α) . . . . . 23  
     r, small caps (r)<sup>+</sup> . . 22, 24  
     v (Λ) . . . . . 25  
 inverted symbols . . . . . 368  
 inverters . . . . . 170, 357–358  
 InVision (👁️) . . . . . 315–318

ion (Ⓜ) . . . . . 178  
 iota  
     lowercase (ι)<sup>+</sup> . 20, 22, 24, 25, 120, 121  
     lowercase, upside-down (ι)<sup>+</sup> . . . . 25, 122, 159, 368  
     uppercase (Ι)<sup>+</sup> . . . . 20, 120  
 IoxHost (🌐) . . . . . 315–318  
 iPhone (📱) . . . . . 329  
 Ireland (🇮🇪) . . . . . 244  
 ironing  
     high temperature (🔥) 257  
     low temperature (🧊) . 257  
     medium temperature (🔥) . . . . . 257  
 irony mark (⸮) . . . . . 368  
 irrational numbers (ℚ) . . . . *see* alphabets, math  
 irritant (⚡) . . . . . 270  
 ISIDORE  
     📖 . . . . . 330–331  
     📖 . . . . . 330–331  
 Islamic star and crescent 290–305  
 island  
     🏝️ . . . . . 297  
     🏝️ . . . . . 313  
 ISO character entities . . . . 384  
 isoent (package) . . . . . 384  
 Isthmian script . . . . . 208–210  
 italic . 19, 33, 376, 378, 380, 382  
 italics (I) . . . . . 173–175  
 Italy (🇮🇹) . . . . . 244  
 Itch.io (🖱️) . . . . . 315–318  
 iTunes  
     🎵 . . . . . 315–318  
     📻 . . . . . 315–318  

**J**

 j  
     dotless (j) . . . . . 26  
     dotless, math mode (j)<sup>+</sup> . . . . . 123, 124, 136  
     🃠 . . . . . 311–312  
 jack of hearts (🃠) . . . . . 311–312  
 jack-o'-lantern . . . . . 52  
     👁️<sup>+</sup> . . . . . 52  
     👁️ . . . . . 52  
     🔺🔺🔺 . . . . . 325–327  
     👁️ . . . . . 301  
     👁️ . . . . . 312  
 jaguar (🐆) . . . . . 208–210  
 Japan (🇯🇵) . . . . . 314

Japanese buttons  
     acceptable (👍) . . . . . 301  
     application (📄) . . . . . 301  
     bargain (👉) . . . . . 301  
     congratulations (🎉) . . . 301  
     discount (🏷️) . . . . . 301  
     free of charge (🆓) . . . . . 301  
     here (📍) . . . . . 301  
     monthly amount (📅) . . . . 302  
     no vacancy (🚫) . . . . . 302  
     not free of charge (🈹) . . . . 302  
     open for business (🏢) . . . . 302  
     passing grade (🎓) . . . . . 302  
     prohibited (🚫) . . . . . 302  
     reserved (🚫) . . . . . 302  
     secret (🔒) . . . . . 302  
     service charge (👉) . . . . . 302  
     vacancy (🚫) . . . . . 302  
 Java (🚗)<sup>+</sup> . . . . . 315–319  
     Duke (👤) . . . . . 318–319  
 JavaScript (JS)<sup>+</sup> . . . . . 315–319  
 JCB (🏦) . . . . . 315–318  
 jeans  
     👖 . . . . . 302  
     👖 . . . . . 281  
 Jedi Order (👤)<sup>+</sup> . . . . . 315–318  
 Jenkins (👤) . . . . . 315–318  
 Jetty (🚢) . . . . . 318–319  
 Jewish star (✡️)<sup>+</sup> . . *see* star, of David  
 Jira (🔍) . . . . . 315–318  
 Joget (👤) . . . . . 315–318  
 join (database)  
     full outer (⋈) . . . . . 160  
     left (⋈)<sup>+</sup> . . . . . 41, 69  
     left outer (⋈) . . . . . 159  
     natural (⋈)<sup>+</sup> 40, 41, 67, 68, 74, 159  
     open (×) . . . . . 69  
     right (⋈)<sup>+</sup> . . . . . 41, 69  
     right outer (⋈) . . . . . 159  
 joint denial (⌋) . . . . *see* arrow  
 joker (🃏) . . . . . 302  
 Joomla (🐘) . . . . . 315–318  
 Journal of the Whills (📖) 328–329  
 joystick  
     🎮 . . . . . 302  
     🎮 . . . . . 314  
 jQuery (🌙) . . . . . 318–319  
 JSFiddle (👁️) . . . . . 315–318  
 JSTOR  
     📖 . . . . . 330–331  
     J . . . . . 330–331


judge (👤)<sup>+</sup> . . . . . 290, 302, 303  
 juggling (🎪)<sup>+</sup> . . . . . 291, 295, 303  
 juicy (🍷) . . . . . 325–327  
 junicode (package) . . . . . 385, 387  
 Junicode.ttf (file) . . . . . 385  
 Juno (👉) . . . . . 168, 335–338  
 Jupiter (♃)<sup>+</sup> 166–168, 335–338  
 justice (⚖️) . . . . . 275

**K**



















K (🇰) . . . . . 270  
 kaaba (🕌) . . . . . 310  
 kaaba (🏠) . . . . . 302  
 kaaba (🏠) . . . . . 310  
 kabob (🍖) . . . . . 286–287  
 Kaggle (🐼) . . . . . 315–318  
 kangaroo (🦘) . . . . . 263  
 kaon . . . . . 177–178  
     minus ( $K^-$ ) . . . . . 178  
     null ( $K^0$ ) . . . . . 178  
     plus ( $K^+$ ) . . . . . 178  
 kappa  
     lowercase ( $\kappa$ )<sup>+</sup> 20, 120, 121  
     lowercase variant ( $\kappa$ )<sup>+</sup> 120, 122  
     uppercase (K)<sup>+</sup> . . . . . 20, 120  
 KDE (🐧) . . . . . 318–319  
 kernel contraction  
     ~ see similar, dots, vertical  
     ~ see similar, dots, vertical  
 ket (⌘)<sup>+</sup> . . . . . 127, 171  
 ketchup (🍷) . . . . . 286–287  
 kettle (🍲) . . . . . 286–287  
 kettle (🍲) . . . . . 286–287  
 key . . . . . 312–314  
     🗝️ . . . . . 311–312  
     🔑 . . . . . 323–325  
     🗝️ . . . . . 325–327  
     🔑 . . . . . 322  
     🔑 . . . . . 302  
     🔑 . . . . . 293  
     🔑 . . . . . 313  
     🔑 . . . . . 313  
 Keybase (🐼) . . . . . 315–318






















keyboard  
     computer (🖱️)<sup>+</sup> . 169, 302, 312, 322–325  
     computer, with mouse (🖱️) . . . . . 312  
     musical (🎹)<sup>+</sup> . . . . . 292, 313  
 keyboard symbols . . . . . 169  
     alternate (⌥) . . . . . 169  
     alternate graphic (⌥Gr) . . . . . 169  
     backspace (⌫) . . . . . 169  
     break (⌵) . . . . . 169  
     command (⌘)<sup>+</sup> . . . . . 253  
     control (⌃) . . . . . 169  
     customizable (⌘) . . . . . 169  
     delete (⌫)<sup>+</sup> . . . . . 169  
     down arrow (⏴) . . . . . 169  
     end (⏹) . . . . . 169  
     enter (⏎) . . . . . 169  
     escape (⏏) . . . . . 169  
     home (⏪) . . . . . 169  
     insert (⏏) . . . . . 169  
     left arrow (⏴) . . . . . 169  
     numeric lock (⏻) . . . . . 169  
     page down (⏴) . . . . . 169  
     page up (⏵) . . . . . 169  
     print screen (⏻) . . . . . 169  
     return (⏎) . . . . . 169  
     right arrow (⏵) . . . . . 169  
     scroll (🔍) . . . . . 169  
     shift (⇧) . . . . . 169  
     spacebar (⏻) . . . . . 169  
     tab (⇧) . . . . . 169  
     up arrow (⏴) . . . . . 169  
 KeyCDN (🐼) . . . . . 315–318  
 keys, computer . . . see keyboard symbols  
 keystroke (package) 169, 387, 388  
 khanda (🗡️) . . . . . 310  
 kick scooter (🛹) . . . . . 321  
 Kickstarter  
     🇰 . . . . . 315–318  
     🇰 . . . . . 315–318  
 kidney (🍲)<sup>+</sup> . . . . . 255  
 kimono (👚) . . . . . 303  
     👚 . . . . . 281  
 king . . . . . 238, 239, 361–363  
     ♔ . . . . . 208–210


































👑 . . . . . 240  
 kiss (💋) . . . . . 303  
     💋 . . . . . 290  
     👄 . . . . . 290  
 kite (🪁) . . . . . 325–327  
     🪁 . . . . . 325–327  
     🪁 . . . . . 303  
 kitten (🐱) . . . . . 264–267  
     🐱 . . . . . 264–267  
 kittens (🐱) . . . . . 264–267  
     🐱 . . . . . 264–267  
     🐱 . . . . . 264–267  
 kiwi bird (🐙) . . . . . 263  
 kiwi fruit (🥝) . . . . . 284  
 kneeling (🧎)<sup>+</sup> . . . . . 291, 295, 303  
 knees (🦵) . . . . . 325–327  
 knife (🔪) . . . . . 287  
     🔪 . . . . . 286–287  
     🔪 . . . . . 286–287  
     hocho (🔪) . . . . . 313  
     kitchen (🔪) . . . . . 303  
 knitting (package) 282, 387, 388  
 knitting symbols . . . . . 282  
 knot (package) . . . . . 348, 352, 387  
 knot (🎣) . . . . . 303  
 knots . . . . . 348–352  
 knotted cloth (🧶) . . . . . 208–210  
 knotted cloth straps (🧶) 208–210  
 Knuth, Donald E. 16, 112, 255, 381, 390  
     symbols by . . . . . 255  
 koala (🐼) . . . . . 263  
     🐼 . . . . . 268  
 koppa  
     lowercase (₴) . . . . . 208  
     uppercase (Ɔ) . . . . . 208  
 Koran (📖) . . . . . 310  
 Korvue (🇰) . . . . . 315–318

Kronecker product ( $\otimes$ ) . . . *see*  
 circled symbols, multiplication  
 Kronecker sum ( $\oplus$ ) . *see* circled  
 symbols, plus  
 kroužek ()<sup>+</sup> . *see* accents, ring

**L**

 . . . . . 270  
 l ( $\ell$ )<sup>+</sup> . . . . . 123, 124  
     with belt ( $\text{†}$ )<sup>+</sup> . . . . . 22, 24  
     with tilde ( $\text{†}$ )<sup>+</sup> . . . . . 22, 25  
 lab coat () . . . . . 303  
 label  
      . . . . . 303  
      . . . . . 312  
 lacrosse () . . . . . 303  
 ladder () . . . . . 303  
 ladle () . . . . . 286–287  
 ladybug  
      . . . . . 264–267  
      . . . . . 263  
      . . . . . 268  
 Lagrangian ( $\mathcal{L}$ ) . *see* alphabets,  
 math  
 . . . . . 264–267  
 lambda  
     lowercase ( $\lambda$ )<sup>+</sup> . 20, 22, 24,  
     120, 121  
     lowercase with slash ( $\lambda$ )<sup>+</sup> .  
     . . . . . 22, 24, 25, 158, 159  
     uppercase ( $\Lambda$ )<sup>+</sup> . 20, 120,  
     121  
 Lamport, Leslie . . . . . 386, 390  
 land masses . 242–246, 312–314  
 language () . . . . . 173–175  
 lantern  
      . . . . . 325–327  
      . . . . . 296  
      . . . . . 314  
 Laplace transform ( $\mathcal{L}$ ) . . . . *see*  
 alphabets, math  
 Laplacian  
      $\Delta$  . . *see* delta, uppercase  
      $\nabla^2$  . . . . . *see* nabla  
 laptop and house () 328–329  
 Laravel  
      . . . . . 315–318  
      . . . . . 318–319







































































large  
      . . . . . 171–172  
      . . . . . 171–172  
 larger than ( $\succ$ ) *see* greater than,  
 horizontally barred  
 laser beam () . . . . . 176  
 Last.fm  
      . . . . . 315–318  
      . . . . . 315–318  
      . . . . . 314  
      . . . . . 314  
 LATEX 1, 14–17, 21, 26, 67, 127,  
 151, 157, 179, 246, 269, 332,  
 358, 363, 364, 367–374, 376,  
 379, 380, 382, 384–390  
 LATEX 2 $\epsilon$  . . . . . 1,  
 16, 18, 19, 33, 37, 67, 82,  
 94, 137, 151, 157, 163, 212,  
 233, 332, 363–368, 371, 373,  
 378, 379, 381–384, 390  
 latexsym (package) . . 37, 67, 82,  
 94, 157, 364, 387, 388  
 Latin 1 . . . . . 17, 382–384, 386  
 Lattes  
      . . . . . 330–331  
      . . . . . 330–331  
 lattice  
     bottom ( $\perp$ )<sup>+</sup> *see* turnstile,  
     up  
     top ( $\top$ )<sup>+</sup> . . . *see* turnstile,  
     down  
 Latvia ( $\ast$ ) . . . . . 242  
 laundry symbols . . . . . 257  
 layer group () . . . . . 173–175  
 LCD numerals . . . . . 164  
 lcircuit (package) . 357, 358, 387  
 leads to ( $\rightsquigarrow$ )<sup>+</sup> *see* arrow, wavy  
 leaf . . . . . 191, 198, 338–339  
      . . . . . 323–325  
      . . . . . 325–327  
      . . . . . 325–327  
      . . . . . 325–327  
      . . . . . 253  
      . . . . . 322  
     falling  
          . . . . . 281  
          . . . . . 298  
     fleuron ()<sup>+</sup> . . . . . 191  
     fluttering  
          . . . . . 281  
          . . . . . 303

maple ()<sup>+</sup> . . . . . 281, 291,  
 315–318  
 leafy green () . . . . . 284  
 Leanpub () . . . . . 315–318  
 ledger  
      . . . . . 303  
      . . . . . 314  
 Lefschetz motive ( $\mathcal{L}$ ) . . . . *see*  
 alphabets, math  
 leg () . . . . . 303  
     mechanical () . . . . . 291  
 legal symbols . . 19, 33, 34, 383  
     Attribution () . . . . . 34  
     BY ()<sup>+</sup> . . . . . 33, 34  
     CC ()<sup>+</sup> . . . . . 33, 34  
     CC BY-NC-ND ()  
     . . . . . 34  
     CC0 ()<sup>+</sup> . . . . . 33, 34  
     copyleft () . . . . . 33  
     copyright ()<sup>+</sup> 19, 33, 34,  
     37, 296, 383  
     NoDerivatives ()<sup>+</sup> 33, 34  
     NonCommercial ()<sup>+</sup> 33,  
     34  
     NonCommercial, euro ()<sup>+</sup>  
     . . . . . 33, 34  
     NonCommercial, yen ()<sup>+</sup>  
     . . . . . 33, 34  
     phonographic copyright  
     () . . . . . 33  
     public domain  
          . . . . . 33  
         <sup>+</sup> . . . . . 33, 34  
     registered trademark ()<sup>+</sup>  
     . . . . . 19, 33, 297, 383  
     Remix ()<sup>+</sup> . . . . . 33, 34  
     Sampling ()<sup>+</sup> . . . . . 33, 34  
     Sampling Plus () . . . . . 33  
     service mark (<sup>SM</sup>) . . . . . 33  
     Share ()<sup>+</sup> . . . . . 33, 34  
     ShareAlike ()<sup>+</sup> . . . . . 33, 34  
     trademark (<sup>TM</sup>)<sup>+</sup> . . . . . 19, 33,  
     300, 383, 384  
 lemon  
      . . . . . 323–325  
      . . . . . 284  
      . . . . . 287  
 length ( $\text{i}$ ) . . . . . 31  
 length mark ( $\text{:}$ ) . . . . . 22  
 Leo ( $\Omega$ )<sup>+</sup> 166–168, 303, 335–338  
 leopard  
      . . . . . 263  
      . . . . . 268  
 lesbian ()<sup>+</sup> . *see* gender signs,  
 female/female










less than ( $<$ )<sup>+</sup> . . . 19, 87, 88, 91, 381, 382  
 arrow ( $\lesssim$ ) . . . . . 90  
 but not approximately equal to ( $\gtrsim$ )<sup>+</sup> . . . . . 85–90  
 but not equal to  
 $\gtrsim$ <sup>+</sup> . . . . . 85, 86, 88–90  
 $\gtrsim$ <sup>+</sup> . . . . . 85, 86, 89, 90  
 $\gtrsim$ <sup>+</sup> . . . . . 85–90  
 but not similar to ( $\lesssim$ )<sup>+</sup> 85–89  
 circle ( $\lessgtr$ )<sup>+</sup> . . . . . 89, 90  
 closed  
 $\lessgtr$ <sup>+</sup> . . . . . 87, 88, 92, 93  
 $\lessgtr$ <sup>+</sup> . . . . . 88, 89  
 closed, negated  
 $\lessgtr$ <sup>+</sup> . . . . . 87, 88, 92, 93  
 $\lessgtr$ <sup>+</sup> . . . . . 88, 89  
 decorative ( $\lessgtr$ ) . . . . . 157  
 dotted ( $\lessgtr$ )<sup>+</sup> 41, 69, 85–88, 90  
 dotted, negated ( $\lessgtr$ )<sup>+</sup> 87, 88  
 horizontally barred ( $\lessgtr$ ) 90  
 much  
 $\lessgtr$ <sup>+</sup> . . . . . 85–88, 90  
 $\lessgtr$ <sup>+</sup> . . . . . 86, 89  
 much, negated ( $\lessgtr$ )<sup>+</sup> 86–88, 90  
 much, underlined ( $\lessgtr$ ) . 90  
 negated ( $\lessgtr$ )<sup>+</sup> . . . . . 85–91  
 or approximately equal to ( $\gtrsim$ )<sup>+</sup> . . . . . 85–90  
 or approximately equal to, negated ( $\gtrsim$ )<sup>+</sup> . . . 86, 88  
 or equal to  
 $\lessgtr$ <sup>+</sup> . . . . . 85–90  
 $\lessgtr$ <sup>+</sup> . . . . . 85–91  
 $\lessgtr$ <sup>+</sup> . . . . . 85–91  
 $\lessgtr$  . . . . . 90  
 $\lessgtr$  . . . . . 154  
 or equal to or greater than  
 $\lessgtr$ <sup>+</sup> . . . . . 85–90  
 $\lessgtr$ <sup>+</sup> . . . . . 85–90  
 $\lessgtr$ <sup>+</sup> . . . . . 87–89  
 $\lessgtr$  . . . . . 90  
 $\lessgtr$  . . . . . 90  
 or equal to or greater than, negated  
 $\lessgtr$ <sup>+</sup> . . . . . 87–89  
 $\lessgtr$ <sup>+</sup> . . . . . 87–89  
 $\lessgtr$ <sup>+</sup> . . . . . 87, 88  
 or equal to, closed  
 $\lessgtr$ <sup>+</sup> . . . . . 87, 88, 92, 93  
 $\lessgtr$ <sup>+</sup> . . . . . 88–90

or equal to, closed, negated  
 $\lessgtr$ <sup>+</sup> . . . . . 87, 88, 92, 93  
 $\lessgtr$ <sup>+</sup> . . . . . 88, 89  
 or equal to, decorative ( $\lessgtr$ ) . . . . . 157  
 or equal to, dotted  
 $\lessgtr$ <sup>+</sup> . . . . . 87, 88, 90  
 $\lessgtr$ <sup>+</sup> . . . . . 87, 88  
 $\lessgtr$  . . . . . 90  
 $\lessgtr$  . . . . . 90  
 or equal to, dotted, negated  
 $\lessgtr$ <sup>+</sup> . . . . . 87, 88  
 $\lessgtr$ <sup>+</sup> . . . . . 87–89  
 or equal to, horizontally barred ( $\lessgtr$ ) . . . . . 90  
 or equal to, negated  
 $\lessgtr$ <sup>+</sup> . . . . . 85–90  
 $\lessgtr$ <sup>+</sup> . . . . . 85–91  
 $\lessgtr$ <sup>+</sup> . . . . . 85–91  
 or greater than ( $\lessgtr$ )<sup>+</sup> 85–90  
 or greater than but not equal to ( $\lessgtr$ ) . . . . . 87  
 or greater than, negated ( $\lessgtr$ )<sup>+</sup> . . . . . 86–88, 90  
 or similar to  
 $\lessgtr$ <sup>+</sup> . . . . . 85–90, 372  
 $\lessgtr$  . . . . . 373  
 or similar to or equal to ( $\lessgtr$ ) . . . . . 89  
 or similar to or greater than ( $\lessgtr$ ) . . . . . 89  
 or similar to, negated ( $\lessgtr$ )<sup>+</sup> . . . . . 86, 88, 90  
 question mark ( $\lessgtr$ ) . . . 90  
 very much  
 $\lessgtr$ <sup>+</sup> . . . 85, 87–90, 365  
 $\lessgtr$  . . . . . 90  
 very much, negated ( $\lessgtr$ )<sup>+</sup> . . . . . 87, 88  
 Less.js (**less**) . . . . . 315–318  
 letter-like symbols . . . 123–125, 330–331  
 letters . . . . . *see* alphabets, 20  
     barred . . . . . 369  
     non-ASCII . . . . . 20  
     rotated . . . . . 22–25, 125  
     variant Greek . . . . . 122  
     variant Latin . . . . . 122  
 level down ( $\Downarrow$ ) . . . . . 173–175  
 level slider  
 $\lessgtr$  . . . . . 303  
 $\lessgtr$  . . . . . 313  
 level up ( $\Uparrow$ ) . . . . . 173–175




Libra ( $\lessgtr$ )<sup>+</sup> . . . . . 166–168, 303, 335–338  
 licenses  
     Creative Commons . . . 34  
 lid ( $\lessgtr$ ) . . . . . 200  
 Lie derivative ( $\mathcal{L}$ ) *see* alphabets, math  
 Liechtenstein ( $\lessgtr$ ) . . . . . 242  
 life preserver ( $\lessgtr$ ) . . . 323–325  
 life-insurance symbols 145, 374  
 lifting weights ( $\lessgtr$ )<sup>+</sup> . . 291, 295, 303  
 ligatures  
     A-E ( $\lessgtr$ ) . . . . . 20  
     a-e ( $\lessgtr$ ) . . . . . 20  
     a-o ( $\lessgtr$ ) . . . . . 23  
     a-o, small caps ( $\lessgtr$ ) . . . 23  
     c-e, with c rotated ( $\lessgtr$ ) 23  
     d-b ( $\lessgtr$ ) . . . . . 23  
     d-yogh ( $\lessgtr$ ) . . . . . 23  
     d-z ( $\lessgtr$ )<sup>+</sup> . . . . . 23, 25  
     d-z, with tail ( $\lessgtr$ )<sup>+</sup> . 22, 23  
     f-j ( $\lessgtr$ )<sup>+</sup> . . . . . 25  
     h-engma ( $\lessgtr$ ) . . . . . 24  
     h-engma, hooked ( $\lessgtr$ )<sup>+</sup> 22, 24  
     h-m ( $\lessgtr$ ) . . . . . 24  
     h-v ( $\lessgtr$ )<sup>+</sup> . . . . . 22, 24  
     I-J ( $\lessgtr$ ) . . . . . 20  
     i-j ( $\lessgtr$ ) . . . . . 20  
     l-r ( $\lessgtr$ ) . . . . . 23  
     l-yogh ( $\lessgtr$ )<sup>+</sup> . . . . . 22, 23  
     l-z ( $\lessgtr$ ) . . . . . 24  
     O-E ( $\lessgtr$ )<sup>+</sup> . . . . . 20, 384  
     o-e ( $\lessgtr$ )<sup>+</sup> . . . . . 20, 384  
     o-e, small caps ( $\lessgtr$ ) . . . 22  
     o-o ( $\lessgtr$ ) . . . . . 24  
     q-p ( $\lessgtr$ ) . . . . . 24  
     t-c, both tailed ( $\lessgtr$ ) . . . 23  
     t-c, with tail ( $\lessgtr$ ) . . . . 22  
     t-esh ( $\lessgtr$ )<sup>+</sup> . . . . . 22, 25  
     t-s ( $\lessgtr$ ) . . . . . 22  
 light bulb  
 $\lessgtr$  . . . . . 311–312  
 $\lessgtr$  . . . . . 323–325  
 $\lessgtr$  . . . . . 325–327  
 $\lessgtr$  . . . . . 322  
 $\lessgtr$  . . . . . 303  
 $\lessgtr$  . . . . . 312  
 $\lessgtr$  . . . . . 378  
 light left tortoise shell bracket ornament ( $\lessgtr$ ) . . . . . 199

- light rail
-  . . . . . 321
  -  . . . . . 254
- light right tortoise shell bracket
- ornament (l) . . . . . 199
- light skin tone () . . . . . 303
- lightbulb.mf (file) . . . 376, 377
- lightbulb.sty (file) . . . 378, 379
- lightning ()<sup>+</sup> . . . . . 95–98, 100–102, 110–111, 118, 171, 253, 258, 325–329, 365
- lightning mood () . . . . . 314
- lightning mood bubble () 314
- Lilith () . . . . . 168
- lily () . . . . . 200
- lilyglyphs* (package) . . . . . 212, 217–225, 230–232, 387
- limits . . . . . 118, 119
- LINE () . . . . . 315–318
- line chart
-  . . . . . 173–175
  -  . . . . . 171–172
  -  . . . . . 171–172
- line feed ()<sup>+</sup> . . . . . 106, 109
- line graph () . . . . . 329
- line load () . . . . . 171
- Linear A symbols . . . . . 202
- Linear B symbols . . . . . 205, 206
- linear implication ( $\rightarrow$ )<sup>+</sup> . . *see* multimap, *see* multimap
- linear logic symbols . . . . . 37
- linearA (package) . . . 202, 387, 388
- linearb (package) . . . 205, 206, 387, 388
- linguistic symbols . . . 22–25, 30
- link
-  . . . . . 173–175
  -  . . . . . 171–172
  -  . . . . . 171–172
  -  . . . . . 303
  -  . . . . . 313
- LinkedIn
-  . . . . . 315–318
  -  . . . . . 315–318
  -  . . . . . 314
  -  . . . . . 314
- Linode () . . . . . 315–318
- Linux () . . . . . 315–318
- Linux Mint () . . . . . 318–319
- lion
-  . . . . . 264–267
-  . . . . . 264–267
-  . . . . . 343–346
-  . . . . . 263
- lips () . . . . . 313
- lipstick
-  . . . . . 303
  -  . . . . . 312
- lira
-  . . . . . 32
  - £ . . . . . 31
- Lisa () . . . . . 306
- list
-  . . . . . 173–175
  -  . . . . . 173–175
  -  . . . . . 173–175
  -  . . . . . 173–175
  -  . . . . . 171–172
  -  . . . . . 171–172
- literature () . . . . . 275
- Lithuania () . . . . . 242
- litter in bin
-  . . . . . 303
  -  . . . . . 254
- liturgical music . . . . . 215
- lizard () . . . . . 263
- llama () . . . . . 263
- \llap . . . . . 31, 372
- lobster
-  . . . . . 343–346
  -  . . . . . 263
- local ring ( $\mathcal{O}$ ) . . *see* alphabets, math
- location ()<sup>+</sup> . . . . . 171–172
- location arrow () . . . 173–175
- lock 290–305, 312–314, 322–325, 330–331
-  . . . . . 303
  -  . . . . . 313
  - open
    -  . . . . . 301
    -  . . . . . 313
  - with key
    -  . . . . . 303
    -  . . . . . 313
  - with pen
    -  . . . . . 303
    -  . . . . . 313
- locker () . . . . . 327
- locust () . . . . . 264–267
- log-like symbols . . . 118, 119, 380
- logic (package) . . . . . 170
- logic gates . . . . . 170, 357–358
- logic symbols . . . . . 37–39, 44, 45, 54, 58–60, 67, 81, 113–115, 123–125, 161
- logical bistability ( $\mathfrak{I}$ ) . . . . . 161
- logical conjunction ( $\wedge$ ) . . . . *see* wedge
- logical disjunction ( $\vee$ ) . . *see* vee
- logical exclusive disjunction ( $\veebar$ ) . . . . *see* vee, bar under
- logical nand ( $\uparrow$ ) . . . . . 44
- logical negation ( $\neg$ )<sup>+</sup> . . . . . 44, 157–160, 383
- classical ( $\sim$ )<sup>+</sup> . . . . . 44
  - dotted ( $\bar{\neg}$ ) . . . . . 44
  - double bar ( $\equiv$ ) . . . . . 77
  - double bar, reversed ( $\Frown$ ) 77
  - inverted ( $\neg$ )<sup>+</sup> . . . 40–42, 44, 158, 159
  - reversed ( $\neg$ )<sup>+</sup> . . . 68, 158, 159
  - reversed and inverted ( $\neg$ )<sup>+</sup> . . . . . 40–42, 158, 159
- logical nor ( $\downarrow$ ) . . . . . 44
- logix (package) . . . 37, 44, 48, 52, 81, 82, 85, 91, 113–115, 125, 134, 135, 153, 161, 387, 388
- logos . . . . . 314–319
- loin cloth () . . . . . 208–210
- lollipop
-  . . . . . 284
  -  . . . . . 287
- lollipop (mathematics) ( $\rightarrow$ )<sup>+</sup> *see* multimap, *see* multimap
- long division . . . . . 139, 141
- long drum () . . . . . 303
- long lip () . . . . . 208–210
- long-branch runes . . *see* normal runes
- long-legged letters
- m, rotated ( $\mathfrak{m}$ )<sup>+</sup> . . . . . 23, 24
  - n ( $\mathfrak{n}$ ) . . . . . 23
  - r ( $\mathfrak{r}$ )<sup>+</sup> . . . . . 22, 24
  - r, rotated ( $\mathfrak{r}$ )<sup>+</sup> . . . . . 23, 24
- longa () . . . . . 214
- longdiv (package) . . . . . 139
- longdiv.tex (file) . . . . . 139
- loop
- $\sigma$  . . . . . 296
  - $\sigma$  . . . . . 199
  - double
    -  . . . . . 199
    -  . . . . . 297





lord (𐤋𐤃) . . . . . 208–210  
 lorry . . . . . *see* truck  
 lose (𐤋𐤃) . . . . . 208–210  
 lost and found (𐤋𐤃) . . . . . 327  
 loudspeaker  
    . . . . . 303  
    . . . . . 314  
 low brightness (☼) . . . . . 256  
 low vision (𐤋𐤃) . . . . . 320  
 lozenge . . . . . *see* rhombus  
 Lua<sup>L</sup>TEX . . . . . 37, 43,  
   44, 52, 66, 67, 81, 82, 85,  
   91, 111, 114, 115, 125, 135,  
   138, 143, 147, 148, 153, 156,  
   161, 172, 181–183, 185, 188,  
   191, 212, 234, 252, 255, 256,  
   258, 259, 261, 263, 271–275,  
   278, 283, 285, 305, 307–310,  
   314, 319–322, 327–329, 331,  
   385  
 Luecking, Dan . . . . . 371  
 luggage  
    . . . . . 323  
    . . . . . 323–325  
    . . . . . 321  
    . . . . . 304  
    . . . . . 254  
 luggage cart (𐤋𐤃) . . . . . 323–325  
 lungs  
    . . . . . 319  
    . . . . . 304  
 Luxembourg (.) . . . . . 242  
 Lyft (𐤋𐤃) . . . . . 315–318

## M

M (𐤌) . . . . . 21, 270  
 ma (𐤌𐤃) . . . . . 208–210  
 macaw  
    . . . . . 208–210  
    . . . . . 208–210  
    . . . . . 264–267  
 Macedonia (.) . . . . . 242  
 machine wash  
   at or below 30°C, reduced  
   spin speed (𐤌𐤃) . . . . . 257  
   at or below 40°C  
   markbothmachine washma-  
   chine wash (𐤌𐤃) . . . . . 257  
   at or below 40°C, reduced  
   spin speed (𐤌𐤃) . . . . . 257  
   at or below 50°C, reduced  
   spin speed (𐤌𐤃) . . . . . 257



at or below 60°C  
 markbothmachine washma-  
 chine wash (𐤌𐤃) . . . . . 257  
 at or below 60°C, reduced  
 spin speed (𐤌𐤃) . . . . . 257  
 at or below 95°C  
 markbothmachine washma-  
 chine wash (𐤌𐤃) . . . . . 257  
 at or below 95°C, reduced  
 spin speed (𐤌𐤃) . . . . . 257  
 by hand (𐤌𐤃) . . . . . 257  
 cotton (𐤌𐤃) . . . . . 257  
 delicate (𐤌𐤃) *see* machine  
 wash, wool/silk  
 maximum agitation (𐤌𐤃) .  
   *see* machine wash, cotton  
 medium agitation (𐤌𐤃) *see*  
 machine wash, synthetics  
 minimal agitation (𐤌𐤃) *see*  
 machine wash, wool/silk  
 normal (𐤌𐤃) *see* machine  
 wash, cotton  
 permanent press (𐤌𐤃) . *see*  
 machine wash, synthetics  
 synthetics (𐤌𐤃) . . . . . 257  
 wool/silk (𐤌𐤃) . . . . . 257  
 macron (̄)<sup>+</sup> *see* accents, macron  
 mage (𐤌𐤃)<sup>+</sup> . . . . . 291, 303, 304  
 Magenta (𐤌𐤃)<sup>+</sup> . . . . . 315–319






Maggie (𐤌𐤃) . . . . . 306  
 magic (package) . . . . . 361, 387  
 magic wand

 . . . . . 328–329  
 . . . . . 304



*Magic: The Gathering* symbols  
 . . . . . 361











magical signs . . . . . 276










































magnet  
    . . . . . 323–325  
    . . . . . 304
























magnifying glass  
    . . . . . 311–312  
    . . . . . 304  
    . . . . . 304  
    . . . . . 312  
    . . . . . 312















magnon (𐤌𐤃) . . . . . 178  
 mahjong tiles . . . . . 238  
   autumn (𐤌𐤃) . . . . . 238  
   back (𐤌𐤃) . . . . . 238  
   bamboo (𐤌𐤃) . . . . . 238  
   chrysanthemum (𐤌𐤃) . . . . . 238

east wind (𐤌𐤃) . . . . . 238  
 eight of bamboos (𐤌𐤃) . . . . . 238  
 eight of characters (𐤌𐤃) . . . . . 238  
 eight of circles (𐤌𐤃) . . . . . 238  
 five of bamboos (𐤌𐤃) . . . . . 238  
 five of characters (𐤌𐤃) . . . . . 238  
 five of circles (𐤌𐤃) . . . . . 238  
 four of bamboos (𐤌𐤃) . . . . . 238  
 four of characters (𐤌𐤃) . . . . . 238  
 four of circles (𐤌𐤃) . . . . . 238  
 green dragon (𐤌𐤃) . . . . . 238  
 joker (𐤌𐤃) . . . . . 238  
 nine of bamboos (𐤌𐤃) . . . . . 238  
 nine of characters (𐤌𐤃) . . . . . 238  
 nine of circles (𐤌𐤃) . . . . . 238  
 north wind (𐤌𐤃) . . . . . 238  
 one of bamboos (𐤌𐤃) . . . . . 238  
 one of characters (𐤌𐤃) . . . . . 238  
 one of circles (𐤌𐤃) . . . . . 238  
 orchid (𐤌𐤃) . . . . . 238  
 plum (𐤌𐤃) . . . . . 238  
 red dragon  
    . . . . . 238  
    . . . . . 304  
 seven of bamboos (𐤌𐤃) . . . . . 238  
 seven of characters (𐤌𐤃) . . . . . 238  
 seven of circles (𐤌𐤃) . . . . . 238  
 six of bamboos (𐤌𐤃) . . . . . 238  
 six of characters (𐤌𐤃) . . . . . 238  
 six of circles (𐤌𐤃) . . . . . 238  
 south wind (𐤌𐤃) . . . . . 238  
 spring (𐤌𐤃) . . . . . 238  
 summer (𐤌𐤃) . . . . . 238  
 three of bamboos (𐤌𐤃) . . . . . 238  
 three of characters (𐤌𐤃) . . . . . 238  
 three of circles (𐤌𐤃) . . . . . 238  
 two of bamboos (𐤌𐤃) . . . . . 238  
 two of characters (𐤌𐤃) . . . . . 238  
 two of circles (𐤌𐤃) . . . . . 238  
 west wind (𐤌𐤃) . . . . . 238  
 white dragon (𐤌𐤃) . . . . . 238  
 winter (𐤌𐤃) . . . . . 238

mailbox  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 295  
    . . . . . 295  
    . . . . . 293  
    . . . . . 293  
    . . . . . 296  
    . . . . . 312  
    . . . . . 312  
    . . . . . 312

 ..... 312  
 ..... 312  
 Mailchimp () ..... 315–318  
 majuscules ..... 120  
 Malta () ..... 242  
 mammoth () ..... 263  
 man  
 ..... 323–325  
 ..... 206  
 ..... 202  
 ..... 202  
 ..... 304  
 ..... 307  
 adult () ..... 307  
 and woman holding hands  
 () ..... 307  
 at drinking fountain () ..... 307  
 at help desk () ..... 307  
 child () ..... 307  
 deaf () ..... 296  
 discarding trash () .. 307  
 getting haircut () .. 304  
 getting massage () .. 304  
 holding infant () ..... 307  
 in business suit levitating  
 () ..... 314  
 in lotus position () .. 290  
 in manual wheelchair () .  
 ..... 290  
 in motorized wheelchair ()  
 ..... 290  
 in steamy room () .. 290  
 in tuxedo () ..... 290  
 old  
 ..... 293  
 ..... 307  
 walking () ..... 307  
 walking dog () ..... 307  
 walking stroller () .. 307  
 wearing turban () .. 291  
 with child () ..... 307  
 with gua pi mao () . 307  
 with luggage waiting () .  
 ..... 307  
 with luggage waving () .  
 ..... 307  
 with service animal () 307  
 with turban () ..... 307  
 with veil () ..... 291  
 with white cane () .. 291





 ..... 311–312  
 manacles () ..... 200  
 Mandalorian () ..... 315–318  
 manfnt (package) . 255, 387, 388  
 mango () ..... 284  
 manicules ..... *see* hand  
 map  
 ..... 323–325  
 ..... 322  
 marked  
 ..... 173–175  
 ..... 173–175  
 of Japan () ..... 291  
 world  
 ..... 304  
 ..... 314  
 map abstraction ( $\lambda$ ) ..... 125  
 map composition ( $\circ$ ) ..... 161  
 map join ( $\sqcup$ )<sup>+</sup> *see* union, square  
 map marker  
 ..... 173–175  
 ..... 173–175  
 map meet ( $\sqcap$ )<sup>+</sup> *see* intersection,  
 square  
 map pin () ..... 173–175  
 map signs () ..... 328–329  
 map symbols ..... 333–334  
 maps ..... 242–246, 312–314  
   European countries 242–244  
   Romanian counties 245–246  
 maps to ( $\mapsto$ )<sup>+</sup> ..... 94, 96, 97,  
 100–102, 105, 107, 111–114  
 diagonal  
 ..... 96  
 ..... 96  
 ..... 97  
 ..... 97  
 diagonal, negated  
 ..... 98  
 ..... 98  
 ..... 98  
 ..... 98  
 double ( $\Leftrightarrow$ )<sup>+</sup> 95, 100–102,  
 105, 107  
 double headed ( $\leftrightarrow$ ) .. 108  
 double, negated ( $\nleftrightarrow$ )<sup>+</sup> 103,  
 104  
 downward ( $\Downarrow$ )<sup>+</sup> .. 96, 101,  
 102, 105, 107  
 downward, double ( $\Downarrow$ )<sup>+</sup> 101,  
 102  
 downward, double, negated  
 ( $\nDownarrow$ )<sup>+</sup> ..... 103, 104




downward, negated ( $\nrightarrow$ )<sup>+</sup> 98,  
 103, 104  
 extensible ( $\mapsto$ )<sup>+</sup> 112, 145,  
 147  
 leftward ( $\leftarrow$ )<sup>+</sup> .. 73, 95,  
 97, 100, 102, 105, 107, 109,  
 111, 112  
 leftward, double ( $\Leftrightarrow$ )<sup>+</sup> 73,  
 95, 100, 102, 105, 107, 109  
 leftward, double headed ( $\leftrightarrow$ )  
 ..... 108  
 leftward, double, negated  
 ( $\nleftrightarrow$ )<sup>+</sup> ..... 75, 102–104  
 leftward, extensible ( $\leftarrow$ )<sup>+</sup> ..  
 ..... 147  
 leftward, negated ( $\leftarrow$ )<sup>+</sup> 75,  
 99, 102–104  
 negated ( $\mapsto$ )<sup>+</sup> . 98, 99, 103,  
 104  
 upward ( $\Uparrow$ )<sup>+</sup> . 97, 101, 102,  
 105, 107  
 upward, double ( $\Uparrow$ )<sup>+</sup> 101,  
 102  
 upward, double, negated ( $\nUparrow$   
 )<sup>+</sup> ..... 103,  
 104  
 upward, negated ( $\nUparrow$ )<sup>+</sup> . 99,  
 103, 104  
 marcato  
 down ( )<sup>+</sup> ..... 214, 220  
 up ( ) ..... 220  
  
 Marge () ..... 306  
 MariaDB () ..... 318–319  
 mark (+) ..... 201  
 Markdown () ..... 315–318  
 marks chapter () ..... 310  
 married ( $\omega$ ) ..... 253  
 Mars ( $\sigma$ )<sup>+</sup> . 166, 168, 335–338  
 martial arts uniform () .. 291  
 marvosym (package) ..... 31,  
 32, 154, 166, 169, 171, 176,  
 182, 187, 255, 257, 279, 365  
 mask () ..... 323–325  
 masonic cipher ..... 278  
 Mastercard () ..... 315–318  
 Mastodon () ..... 315–318  
  
 mat () ..... 325–327  
 mate () ..... 284





material biconditional ( $\equiv$ )<sup>+</sup> *see*  
 equivalence  
 material conditional  
 $\rightarrow$ <sup>+</sup> *see* arrow  
 $\supset$ <sup>+</sup> *see* superset, strict  
 material equivalence  
 $\equiv$ <sup>+</sup> *see* equivalence  
 $\leftrightarrow$ <sup>+</sup> *see* arrow, double  
 ended  
 material implication  
 $\rightarrow$ <sup>+</sup> *see* arrow  
 $\supset$ <sup>+</sup> *see* superset, strict  
 $\Rightarrow$  77  
 material nonimplication  
 $\nrightarrow$ <sup>+</sup> *see* arrow  
 $\not\supset$ <sup>+</sup> *see* superset, strict,  
 negated  
 math alphabets 162  
 mathabx (package) 36, 39, 45,  
 55, 69, 70, 83, 86, 91, 95,  
 96, 118, 123, 126–128, 136,  
 141, 155, 158, 166, 270, 364,  
 365, 387, 388  
 mathbbol (package) 162, 163  
 mathcomp (package) 154  
 mathdesign (package) 32, 43, 65,  
 125, 132, 160, 387  
 mathdots (package) 136, 151,  
 153, 373, 387, 388  
 mathematical symbols 36–163  
 mathematics ( $\mathbb{A}$ ) 275  
 MathOverflow  
 $\mathbb{m}$  330–331  
 $\mathbb{m}$  330–331  
 mathrsfs (package) 162, 387  
 mathspec (package) 120  
 mathspec.sty (file) 120  
 mathtools (package) 36, 79, 112,  
 141, 145, 387, 388  
 matryoshkas ( $\mathbb{R}$ ) 293  
 mattock ( $\mathbb{L}$ ) 200  
 Maven ( $\mathbb{V}$ ) 318–319  
 MaxCDN ( $\mathbb{M}$ ) 315–318  
 maxima ( $\mathbb{M}$ ) 214  
 maximize ( $\mathbb{M}$ ) 313  
 Maxwell distribution ( $\mathbb{M}$ ) 178  
 Maxwell-Stefan diffusion coeffi-  
 cient ( $\mathbb{D}$ ) *see* barred  
 letters, D  
 Mayan numerals 155  
 mbboard (package) 162, 163, 387  
 MDB ( $\mathbb{M}$ ) 315–318  
 mdwmath (package) 145, 387,  
 388



me ( $\mathbb{M}$ ) 208–210  
 measured angles 155, 156, 158  
 meat ( $\mathbb{M}$ ) 285  
 on bone  
 $\mathbb{M}$  284  
 $\mathbb{M}$  287  
 mechanic ( $\mathbb{M}$ )<sup>+</sup> 291, 303  
 mechanical scaling 376, 378  
 medal ( $\mathbb{M}$ ) 323–325  
 bronze ( $\mathbb{M}$ ) 292  
 gold ( $\mathbb{M}$ ) 292  
 military  
 $\mathbb{M}$  292  
 $\mathbb{M}$  313  
 silver ( $\mathbb{M}$ ) 292  
 sports  
 $\mathbb{M}$  241  
 $\mathbb{M}$  299  
 MedApps ( $\mathbb{M}$ ) 315–318  
 media control symbols 255, 256,  
 312–314  
 down  
 $\mathbb{M}$  255  
 $\mathbb{M}$  297  
 $\mathbb{M}$  298  
 eject  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 forward  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  256  
 $\mathbb{M}$  256  
 $\mathbb{M}$  256  
 $\mathbb{M}$  256  
 $\mathbb{M}$  293  
 $\mathbb{M}$  298  
 pause  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 play  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  256  
 $\mathbb{M}$  256  
 $\mathbb{M}$  295  
 play or pause ( $\mathbb{M}$ ) 295  
 record  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 reverse  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255


$\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  256  
 $\mathbb{M}$  256  
 $\mathbb{M}$  256  
 $\mathbb{M}$  297  
 $\mathbb{M}$  298  
 $\mathbb{M}$  303  
 stop  
 $\mathbb{M}$  255  
 $\mathbb{M}$  255  
 $\mathbb{M}$  256  
 $\mathbb{M}$  256  
 $\mathbb{M}$  256  
 $\mathbb{M}$  299  
 up  
 $\mathbb{M}$  255  
 $\mathbb{M}$  298  
 $\mathbb{M}$  301  
 medical symbols 186, 275,  
 290–305, 319  
 medieval runes 211  
 Medium  
 $\mathbb{M}$  315–318  
 $\mathbb{M}$  315–318  
 medium cœli ( $\mathbb{M}$ ) 168  
 medium left-pointing angle  
 bracket ornament ( $\mathbb{M}$ ) 199  
 medium right-pointing angle  
 bracket ornament ( $\mathbb{M}$ ) 199  
 medium skin tone ( $\mathbb{M}$ ) 291  
 medium-dark skin tone ( $\mathbb{M}$ ) 291  
 medium-light skin tone ( $\mathbb{M}$ ) 291  
 medkit ( $\mathbb{M}$ ) 319  
 Meetup ( $\mathbb{M}$ ) 315–318  
 megaphone  
 $\mathbb{M}$  291  
 $\mathbb{M}$  312  
 Megaport ( $\mathbb{M}$ ) 315–318  
 Mellin transform ( $\mathcal{M}$ ) *see*  
 alphabets, math  
 melon  
 $\mathbb{M}$  284  
 $\mathbb{M}$  287  
 member of ( $\in$ )<sup>+</sup> *see* set  
 membership  
 memo ( $\mathbb{M}$ ) 314  
 memory ( $\mathbb{M}$ ) 323–325  
 men 200, 201, 206, 254, 257,  
 290–305, 307, 308, 333–334,  
 352–357


holding hands  
 ..... 291  
 ..... 307  
 with bunny ears () .. 291  
 wrestling () ..... 292


Mendeley  
 ..... 330–331  
 ..... 330–331  
 ..... 315–318


menorah  
 ..... 310  
 ..... 310  
 ..... 292  
 ..... 310


menu  
 ..... 171–172  
 ..... 171–172

Mercury ()<sup>+</sup> 166–168, 328–329, 335–338

merge ()<sup>+</sup> *see* wedge, double

mermaid () ..... 292

merman () ..... 292

merperson () ..... 292

meson ..... 177–178

    B minus ( $B^-$ ) ..... 178

    B null ( $B^o$ ) ..... 178

    B plus ( $B^+$ ) ..... 178

    D minus ( $D^-$ ) ..... 178

    D null ( $D^o$ ) ..... 178

    D plus ( $D^+$ ) ..... 178

    eta ( $\eta$ ) ..... 178

    eta, prime ( $\eta'$ ) ..... 178

    J/psi ( $\mathcal{Y}$ ) ..... 178

    phi ( $\phi$ ) ..... 178

    phi, null ( $\phi^o$ ) ..... 178

    rho, minus ( $\rho^-$ ) ..... 178

    rho, null ( $\rho^o$ ) ..... 178


    rho, plus ( $\rho^+$ ) ..... 178


    T minus ( $T^-$ ) ..... 178


    T null ( $T^o$ ) ..... 178

    T plus ( $T^+$ ) ..... 178

    Upsilon ( $Y$ ) ..... 178


message () ..... 171–172



message typing () .. 171–172


messages () ..... 171–172


METAFONT .. 16, 163, 375–377, 379


METAFONTbook symbols .. 255


meteor () ..... 323–325


meter, musical  
<sup>+</sup> ..... *see* alla breve  
 ..... 214


 .. *see* common time, forward and reversed


 *see* alla breve, reversed


 ..... *see* common time

 ..... 216

 ..... 216

 ..... 216



 ..... *see* common time

 ..... 216

method ( $\mathbb{M}$ ) ..... 178

metre (package) .. 29, 135, 271, 387, 388


metrical symbols ..... 271, 272


metro  
 ..... 321  
 ..... 254


mezzo ( $m$ ) ..... 219, 232







.mf files ..... 16, 332, 376






micro ( $\mu$ )<sup>+</sup> .. *see* mu, lowercase upright



Micro.blog () ..... 315–318


microbe () ..... 262

microchip () ..... 323–325


microphone  
<sup>+</sup> ..... 322–325  
 ..... 299  
 ..... 292  
 ..... 313  
 ..... 313  
 slashed ()<sup>+</sup> .. 173–175

microscope  
 ..... 321  
 ..... 323–325  
 ..... 329  
 ..... 292  
 ..... 313

Microsoft  
 ..... 315–318  
 ..... 314


Microsoft SQL Server () 318–319


Microsoft Windows ..... 384


middle () ..... 127, 208–210



midheaven ( $M^{\circ}$ ) .. *see* medium coeli

MIL-STD-806 ..... 170

military () ..... 275


military helmet () ..... 292



milk () ..... 286–287


milky way  
 ..... 292  
 ..... 312

millesimal sign ( $\text{‰}$ )<sup>+</sup> .. *see* per mill

milstd (package) .. 170, 387, 388

mine sign () ..... 257

minibus  
 ..... 321  
 ..... 254

minidisc () ..... 313

Minkowski space ( $M$ ) ..... *see* alphabets, math










minus ( $-$ )<sup>+</sup> ..... 37, 40–42, 160



    colon ( $-:$ )<sup>+</sup> ..... 77, 81




    colon, double ( $-::$ ) ..... 81





    comma ( $\pm$ ) ..... 42

    commercial ( $\text{‰}$ ) ..... 34

    decorative  
 ..... 154  
 ..... 156  
 ..... 156  
 ..... 157  
 ..... 173–175  
 ..... 173–175  
 ..... 173–175  
 ..... 199  
 ..... 292

dot  
<sup>+</sup> ..... 37, 40, 41, 43, 76  
<sup>+</sup> ..... 40–42

dots  
<sup>+</sup> ..... 41, 42  
<sup>+</sup> ..... 41, 42  
<sup>+</sup> ..... 73, 78



hooked  
<sup>+</sup> ..... 41, 159  
<sup>+</sup> ..... 41, 158, 159  
<sup>+</sup> ..... 158, 159  
<sup>+</sup> ..... 158, 159

u ( $\text{u}$ ) ..... 42

    with circle overlay ( $\text{u}^{\circ}$ )<sup>+</sup> 38, 42, 370

minus or plus ( $\mp$ )<sup>+</sup> .. 37, 40–42


minutes, angular ..... *see* prime


mirror  
 ..... 325–327  
 ..... 292


miscellaneous symbols 157–161, 198, 199, 253–331


mismatch (package) .. 119, 387


“Missing \$ inserted” ..... 36

mitten () ..... 323–325

Mix () ..... 315–318

Mixcloud () ..... 315–318

Mixer () ..... 315–318

Mizuni () ..... 315–318

MnSymbol (package) 36, 39, 40, 45, 58, 59, 70–72, 83, 87, 92, 96–100, 115, 116, 122, 124, 128, 136, 139, 140, 152, 155, 158, 192, 212, 233, 387, 388

moai (🗿) . . . . . 290

mobile devices (📱) . . . . . 329

mobile phone . . . *see* cell phone

models (|=)<sup>+</sup> . . . . . *see* turnstile, double dash, right

moduli space . . . *see* alphabets, math

MODX (🔌) . . . . . 315–318

Moldova (🇲🇩) . . . . . 242

Monero (📄) . . . . . 315–318

monetary symbols . . 31–33, 37, 163, 290–305, 312–314

money bag

    💰 . . . . . 292

    👛 . . . . . 313

money with wings

    🦋 . . . . . 292

    🦋 . . . . . 313

MongoDB (📄) . . . . . 318–319

monitor (🖥) . . . . . 321

monkey

    🐵 . . . . . 264–267

    🐵 . . . . . 264–267

    🐵 . . . . . 201

    🐵 . . . . . 201

    🐵 . . . . . 262

    🐵 . . . . . 262

    🐵 . . . . . 268

    🐵 . . . . . 268

hear no evil

    🙊 . . . . . 289

    🙊 . . . . . 300

see no evil

    🙊 . . . . . 289

    🙊 . . . . . 298

speak no evil

    🙊 . . . . . 289

    🙊 . . . . . 299

monorail

    🚆 . . . . . 321

    🚆 . . . . . 254

monster

    👹 . . . . . 208–210

    👹 . . . . . 325–327

Montenegro (🇲🇪) . . . . . 242

Monty Python’s Flying Circus . . . . . 308

monument (🗿) . . . . . 323–325

monus (±) . . . *see* division, single dot

moo (🐮)<sup>+</sup> . . . . . 38, 42

mood bubble (🗨) . . . . . 314

Moodle

    📖 . . . . . 330–331

    📖 . . . . . 330–331

moon . . . . . 166–168, 278, 279, 323–325, 334–338

    🌕 . . . . . 279

    🌕 . . . . . 279

crescent

    🌘 . . . . . 166

    🌘 . . . . . 167

    🌘 . . . . . 278

first quarter

    🌑 . . . . . 166

    🌑 . . . . . 166

    🌑 . . . . . 166

    🌑 . . . . . 167

    🌑 . . . . . 167

    🌑 . . . . . 167

    🌑 . . . . . 167

    🌑 . . . . . 168

    🌑 . . . . . 259

    🌑 . . . . . 278

    🌑 . . . . . 278

    🌑 . . . . . 278

full

    🌕 . . . . . 166

    🌕 . . . . . 166

    🌕 . . . . . 167

    🌕 . . . . . 167

    🌕 . . . . . 167

    🌕 . . . . . 278

    🌕 . . . . . 278

    🌕 . . . . . 278

last quarter

    🌒 . . . . . 166

    🌒 . . . . . 166

    🌒 . . . . . 166

    🌒 . . . . . 167

    🌒 . . . . . 167

    🌒 . . . . . 167

    🌒 . . . . . 168

    🌒 . . . . . 168

    🌒 . . . . . 278

    🌒 . . . . . 278

    🌒 . . . . . 278

new

    🌑 . . . . . 166

    🌑 . . . . . 166

    ● . . . . . 167

    ● . . . . . 167

    ☺ . . . . . 278

    ☺ . . . . . 278

    ☺ . . . . . 278

waning crescent

    🌘 . . . . . 167

    🌘 . . . . . 278

waning gibbous

    🌔 . . . . . 167

    🌔 . . . . . 278

waxing crescent

    🌑 . . . . . 167

    🌑 . . . . . 278

waxing gibbous

    🌒 . . . . . 167

    🌒 . . . . . 278

moon cake (🌕) . . . . . 284

moon viewing ceremony

    🌕 . . . . . 292

    🌕 . . . . . 313

moonphase (package) . 334, 387

moose (🦌) . . . . . 264–267

mordent

    🎵 . . . . . 214

    🎵 . . . . . 214

mortar and pestle (🔪) 323–325

mortarboard

    🎓 . . . . . 323–325

    🎓 . . . . . 322

    🎓 . . . . . 300

    🎓 . . . . . 313

    as math-mode accent (🎓) . . . . . 138

mosque

    🕌 . . . . . 310

    🕌 . . . . . 292

    🕌 . . . . . 310

motor scooter

    🛵 . . . . . 321

    🛵 . . . . . 254

motorcycle . . . . . 254

    🏍 . . . . . 323–325

    🏍 . . . . . 325–327

    🏍 . . . . . 325–327

    🏍 . . . . . 321































motorway









    🛣 . . . . . 321























    🛣 . . . . . 254

Mount Fuji







    🗻 . . . . . 292
















































 ..... 314  
 mountain  
 ..... 208–210  
 ..... 259  
 ..... 259  
 ..... 259  
 ..... 259  
 ..... 323–325  
 ..... 292  
 mountain cableway  
 ..... 321  
 ..... 254  
 mountain railway  
 ..... 320  
 ..... 254  
 mouse  
 ..... 264–267  
 ..... 264–267  
 ..... 264–267  
 ..... 264–267  
 ..... 262  
 ..... 262  
 ..... 268  
 ..... 268  
 computer (☞)<sup>+</sup> .. 169, 296,  
 312, 323–325  
 pointer (☞) ..... 173–175  
 mouse trap (🐭) ..... 292  
 mouth  
 ..... 292  
 ..... 312  
 move down (▼) ..... 255  
 move up (▲) ..... 255  
 movie camera  
 ..... 292  
 ..... 313  
 moyai  
 ..... 292  
 ..... 314  
 Mrs. Claus  
 ..... 292  
 ..... 292  
 MRT (🚇) ..... 315–318  
 MTMT  
 ..... 330–331  
 ..... 330–331  
 mu  
 lowercase ( $\mu$ )<sup>+</sup> .. 20, 120,  
 121, 154, 165, 383













































































lowercase upright ( $\mu$ )<sup>+</sup> 20,  
 164  
 uppercase (M)<sup>+</sup> .. 20, 120  
 mug  
 ..... 321  
 ..... 323–325  
 ..... 286–287  
 multiline braces ..... 144  
 multimap (↔)<sup>+</sup> 68, 69, 76, 77,  
 81, 115, 117  
 black (↔)<sup>+</sup> 69, 76, 115, 117  
 diagonal (↘)<sup>+</sup> ..... 115  
 dual (↔)<sup>+</sup> 69, 76, 78, 81,  
 117  
 dual, black (↔)<sup>+</sup> .. 69, 76,  
 117  
 dual, negated (↔) ..... 117  
 dual, vertical (↕)<sup>+</sup> .. 69, 76  
 dual, vertical, black (↕)<sup>+</sup> 69,  
 76  
 image (↔)<sup>+</sup> 69, 76, 77, 117  
 inverse (↔)<sup>+</sup> 69, 76, 77, 81,  
 115, 117  
 inverse, black (↔)<sup>+</sup> 69, 76,  
 115, 117  
 negated (↔)<sup>+</sup> 81, 115, 117  
 origin (↔)<sup>+</sup> 69, 76, 77, 117  
 vertical (↕)<sup>+</sup> ..... 115, 117  
 vertical, black (↕)<sup>+</sup> 115, 117  
 vertical, black and white  
 (↕)<sup>+</sup> ..... 69, 76  
 multiple accents per character .  
 ..... 373  
 multiplication  
 cross (×)<sup>+</sup> ..... *see* times  
 dot (·)<sup>+</sup> 37, 39, 40, 42, 151,  
 152, 154, 369  
 multiplicative disjunction (⋈)<sup>+</sup>  
*see* ampersand, inverted  
 muon ( $\mu^-$ ) ..... 178  
 Museum of Icelandic Sorcery and  
 Witchcraft ..... 277  
 mushroom  
 ..... 286–287  
 ..... 286–287  
 ..... 286–287  
 ..... 284  
 ..... 287  
 musical meters ..... 214, 216

musical notes  
 ..... 213  
 ..... 213, 218  
 ..... 311–312  
 ..... 173–175, 328  
 ..... 212  
 ..... 218  
 ..... 218  
 ..... 218  
 ..... 218  
 ..... 328  
 ..... 292  
 ..... 292  
 ..... 212, 213  
 ..... 213  
 ..... 213  
 ..... 213  
 musical score (🎵)<sup>+</sup> .. 213, 292  
 musical symbols ..... 173–175,  
 212–232, 311–314, 328, 360  
 musicography (package) .. 216,  
 387, 388  
 musixgre (package) ..... 215  
 musixlit (package) ..... 215  
 musixper (package) ..... 215  
 MusiX<sub>TEX</sub> ..... 214–217  
 musixtex (package) ... 387, 388  
 mute  
 ..... 173–175  
 ..... 173–175  
 ..... 256  
 ..... 255  
 MySQL  
 ..... 318–319  
 ..... 318–319  
  










































### N

 N (🇳🇵) ..... 270  
 nabla (∇)<sup>+</sup> ..... 157–159  
 nadir (|<sub>Q</sub>) ..... *see* imum coeli  
 nail polish  
 ..... 292  
 ..... 312  
 naira (₦) ..... 31  
 NAKALA  
 ..... 330–331  
 ..... 330–331  
 name badge  
 ..... 292  
 ..... 314  
 NAND gates ..... 170, 357–358













- nanny ( $\tilde{\Lambda}$ ) . . . . . 206  
 Napster ( $\text{Ⓜ}$ ) . . . . . 315–318  
 natal ( $\mathbb{N}^\text{#}$ ) . . . . . 168  
 nath (package) . . . 127, 133, 387  
 national park  
    . . . . . 292  
    . . . . . 314  
 natural ( $\text{h}^+$ ) 212, 213, 216, 219  
 natural numbers ( $\mathbb{N}$ ) . . . . . *see*  
   alphabets, math  
 Naturalist  
    . . . . . 330–331  
    . . . . . 330–331  
 nazar amulet ( $\text{Ⓞ}$ ) . . . . . 292  
 necessity ( $\blacksquare$ ) . . . . . 48  
   deontic ( $\square$ ) . . . . . 50  
   doxastic ( $\boxplus$ ) . . . . . 51  
   factual ( $\square$ ) . . . . . 51  
   logical ( $\boxplus$ ) . . . . . 52  
   temporal ( $\boxplus$ ) . . . . . 49  
 necktie  
    . . . . . 292  
    . . . . . 281  
 negation ( $\neg^+$ ) . . . . . *see* logical  
   negation  
 neither true nor false ( $\perp$ ) . . 125  
 Neos ( $\mathbb{N}$ ) . . . . . 315–318  
 Neptune ( $\text{♃}^+$ ) . . . . . 166–168  
 nesting dolls ( $\text{👶}$ ) . . . . . 293  
 NetBSD ( $\text{⌘}$ ) . . . . . 318–319  
 Netherlands ( $\text{.}$ ) . . . . . 242  
 network, wired ( $\text{🌐}$ ) . . 173–175  
 neumes . . . . . 215  
 neutrino ( $\nu$ ) . . . . . 178  
 neutron ( $n^0$ ) . . . . . 178  
 NEW ( $\text{NEW}$ ) . . . . . 293  
 newspaper  
    . . . . . 323–325  
    . . . . . 322  
    . . . . . 293  
    . . . . . 312  
   rolled  
      . . . . . 297  
      . . . . . 313  
 next ( $\bullet$ ) . . . . . 48  
   deontic ( $\circ$ ) . . . . . 50  
   doxastic ( $\odot$ ) . . . . . 51  
   factual ( $\circ$ ) . . . . . 51  
   logical ( $\odot$ ) . . . . . 52  
   temporal ( $\ominus$ ) . . . . . 49  
 NG ( $\text{NG}$ ) . . . . . 293  
 NGINX  
    . . . . . 318–319  
    . . . . . 318–319
- $\text{Ⓔ}$  . . . . . 318–319  
 nib . . . . . 183, 184  
    . . . . . 183  
    . . . . . 183  
    . . . . . 183  
    . . . . . 183  
    . . . . . 183  
    . . . . . 184  
    . . . . . 184  
 nib shapes  
    . . . . . 255  
    . . . . . 255  
    . . . . . 255  
    . . . . . 255  
 nicefrac (package) 160, 387, 388  
 niceframe (package) 339–342, 352  
 night with stars  
    . . . . . 293  
    . . . . . 312  
 Nimblr ( $\text{Ⓢ}$ ) . . . . . 315–318  
 ninja  
    . . . . . 288  
    . . . . . 293  
 nkarta (package) . . . 333, 387  
 no  
    . . . . . 271  
    . . . . . 328–329  
    . . . . . 296  
    . . . . . 254  
    . . . . . 254  
   no bicycles ( $\text{🚲}^+$ ) . . . . . 254, 320  
   no dogs ( $\text{🐕}$ ) . . . . . 271  
   no dry cleaning ( $\text{☹}$ ) . . . . . 257  
   no entry ( $\text{🚫}^+$ ) . . . . . 257, 293  
   no littering ( $\text{🗑}$ ) . . . . . 293  
   no mobile phones ( $\text{📵}^+$ ) . . 271,  
     293, 312  
   no one under eighteen  
      . . . . . 293  
      . . . . . 313  
   no parking ( $\text{🚫}$ ) . . . . . 271  
   no pedestrians ( $\text{🚶}^+$ ) . . 254, 293  
   no piracy ( $\text{🚫}$ ) . . . . . 314  
   no smoking  
      . . . . . 271  
      . . . . . 328–329  
      . . . . . 293  
      . . . . . 254  
 Node ( $\text{node}$ ) . . . . . 315–318  
 Node.js ( $\text{🌐}^+$ ) . . . . . 315–319  
 non-commutative division . 151  
 non-contingency ( $\blacktriangle$ ) . . . . 48  
   deontic ( $\triangle$ ) . . . . . 50  
   doxastic ( $\triangle$ ) . . . . . 51  
   factual ( $\triangle$ ) . . . . . 51  
   logical ( $\triangle$ ) . . . . . 52  
   temporal ( $\triangle$ ) . . . . . 49
- logical ( $\triangle$ ) . . . . . 52  
 temporal ( $\triangle$ ) . . . . . 49  
 nor ( $\nabla$ ) . . . . . *see* vee, bar over  
 NOR gates . . . . . 170, 357–358  
 norm ( $\| \|$ ) . . . . . *see* delimiters,  
   double vertical bar  
 normal runes . . . . . 211  
 normal subgroup ( $\triangleleft$ ) . . . . . 161  
 north node ( $\text{♁}$ ) . . . . . 168  
 Norway ( $\text{🇳🇴}$ ) . . . . . 243  
 nose  
    . . . . . 325–327  
    . . . . . 293  
    . . . . . 312  
 not  
    $\neg^+$  . . . . . *see* logical negation  
    $/^+$  . . . . . *see* slash  
 not equal ( $\neq^+$ ) . . . . . *see* equal,  
   negated  
 not false ( $\dashv$ ) . . . . . 125  
 not true ( $\perp$ ) . . . . . 125  
 note ( $\text{📄}$ ) . . . . . 313  
 note pad ( $\text{📝}$ ) . . . . . 313  
 note page ( $\text{📄}$ ) . . . . . 313  
 notebook  
    . . . . . 293  
    . . . . . 314  
 notebook with decorative cover  
    . . . . . 293  
    . . . . . 314  
 now ( $\text{🕒}$ ) . . . . . 208–210  
 npm ( $\text{npm}$ ) . . . . . 315–319  
 ntheorem (package) . . . . . 157  
 nu  
   lowercase ( $\nu^+$ ) 20, 120, 121  
   uppercase ( $\text{N}^+$ ) . . 20, 120  
 nuclear power plant ( $\text{☢}$ ) . . 306  
 nucleus ( $\text{☉}$ ) . . . . . 178  
 nuggets ( $\text{🍪}$ ) . . . . . 286–287  
 null character ( $\text{␣}$ ) . . . . . 170  
 null infinity *see* alphabets, math  
 null set . . . . . *see* empty set  
 number sets *see* alphabets, math  
 number sign  
    $\#^+$  . . . . . *see* hash  
    $\text{N}^\text{e}$  . . . . . 34  
 numbers . . . . . *see* numerals  
 numerals . . . 154, 155, 205, 210,  
   232, 270, 333–334  
   circled . 188, 189, 240, 361  
   Epi-Olmec . . . . . 210  
   Isthmian . . . . . 210




































































































- LCD ..... 164  
 Linear B ..... 205  
 Mayan ..... 155  
 old-style ..... 34  
 rotated ..... 154  
 segmented ..... 164
- nut and bolt  
 ..... 293  
 ..... 313
- Nutritionix () ..... 315–318
- O**
-  ..... 270  
 o (*o*) ..... 120  
 o  
   open ()<sup>+</sup> ..... 23–25  
 o (*o*) ..... 119
- obelus  
 —<sup>+</sup> ..... 271  
 ÷<sup>+</sup> ..... 271
- Objective C () ..... 318–319
- OBP  
 ..... 330–331  
 ..... 330–331
- octagon () ..... 192  
 octagonal sign () ..... 254
- octahedron () ... 311–312
- octonions () .. *see* alphabets, math
- octopus  
 ..... 264–267  
 ..... 264–267  
 ..... 262  
 ..... 268
- Octopus Deploy () . 315–318
- octothorpe ()<sup>+</sup> ..... *see* hash
- oden  
 ..... 284  
 ..... 287
- Odnoklassniki  
 ..... 315–318  
 ..... 315–318
- of course  
 ! ..... 37  
 ? ..... 161
- office building  
 ..... 293  
 ..... 314
- office worker ()<sup>+</sup> 291, 293, 303
- officer  
 ..... 208–210  
 ..... 208–210  
 ..... 208–210  
 ..... 208–210  
 ..... 208–210
- ogonek (package)<sup>+</sup> . *see* accents, ogonek, 30, 387, 388
- ogre  
 ..... 293  
 ..... 307
- ohm ..... *see* omega
- oil can () ..... 323–325
- oil drum  
 ..... 293  
 ..... 254
- OK () ..... 293
- Old Republic () . . . 315–318
- old-arrows (package) . . 112, 387
- old-style numerals ..... 34
- olive  
 ..... 206  
 ..... 284
- Olschok, Marc ..... 368
- om  
 ..... 310  
 ..... 293  
 ..... 310
- omega  
 lowercase ( $\omega$ )<sup>+</sup> . 20, 23, 24, 120, 121, 161  
 lowercase closed ( $\omega$ )<sup>+</sup> . 22, 24  
 lowercase variant ( $\omega$ ) . 25  
 lowercase, upside-down ( $\omega$ ) ..... 23  
 uppercase ( $\Omega$ )<sup>+</sup> 20, 22, 120, 121, 154, 164, 165  
 uppercase, upside-down ( $\Omega$ )<sup>+</sup> . . . 25, 122, 157, 165
- omicron  
 lowercase (*o*)<sup>+</sup> . . . 20, 120  
 uppercase (*O*)<sup>+</sup> . . . 20, 120
- ON! with arrow ()<sup>+</sup> . 293, 313
- one-piece swimsuit () ..... 293
- onion  
 ..... 286–287  
 ..... 284
- Open Access  
 ..... 330–331  
 ..... 330–331
- open book  
 ..... 293  
 ..... 314
- open box operator  
 left () ..... 77  
 right () ..... 77
- Open Data  
 ..... 330–331  
 ..... 330–331
- Open Edition  
 ..... 330–331  
 ..... 330–331
- open file folder () ..... 313
- open folder () ..... 313
- Open Materials  
 ..... 330–331  
 ..... 330–331
- open unit disk () ..... *see* alphabets, math
- OpenCart () ..... 315–318
- OpenID () ..... 315–318
- OpenShift () ..... 318–319
- OpenType ..... 212
- Opera () ..... 315–318
- operators  
 binary ..... 37–52  
 set ..... *see* set operators
- Ophiuchus () ..... 294
- oplotsymb1 (package) . 196–198, 387, 388
- opposition ( $\sigma$ )<sup>+</sup> . . . . 166–168, 335–338
- optical scaling ..... 376
- OptinMonster () . . 315–318
- options . . . *see* package options
- or ( $\vee$ ) ..... *see* vee
- OR gates ..... 170, 357–358
- Oracle  
 ..... 318–319  
 ..... 318–319
- orangutan () ..... 262
- orbit () ..... 178
- orca () ..... 264–267
- Orch OR ..... 329
- orchestrated objective reduction symbols ..... 329
- ORCID  
 ..... 330–331  
 ..... 330–331  
 ..... 315–318
- ordered list () ..... 173–175
- ordinal  
 feminine (*a*)<sup>+</sup> . . . . 19, 383


































































































- masculine ( $^{\circ}$ )<sup>+</sup> . . . 19, 383  
 ornament () . . . 311–312  
 ornaments . . 189–191, 197, 198,  
 338–340, 343–352  
 orthogonal ( $\perp$ )<sup>+</sup> . *see* turnstile,  
 up  
 OS X () . . . . . 318–319  
 OSF  
 . . . . . 330–331  
 . . . . . 330–331  
 OSI () . . . . . 315–318  
 ostrich () . . . . . 264–267  
 .otf files . . . . . 212  
 otter  
 . . . . . 263  
 . . . . . 262  
 outbox  
 . . . . . 294  
 . . . . . 312  
 outdent () . . . . . 173–175  
 outer joins . . . . . 159–160  
 oven  
 . . . . . 287  
 . . . . . 288  
 bottom heat () . . . . . 287  
 convection () . . . . . 287  
 gas () . . . . . 287  
 top and bottom heat () .  
 . . . . . 287  
 top heat () . . . . . 287  
 oven mitts () . . . . . 287  
 overarrows (package) . 144, 387,  
 388  
 overlap () . . . . . 313  
 Overleaf  
 . . . . . 330–331  
 . . . . . 330–331  
 overline ()<sup>+</sup> . . . . . *see* accents,  
 overline  
 overrightarrow (package) 139, 387  
 owl  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 343–346  
 . . . . . 202  
 . . . . . 262  
 owns ( $\ni$ )<sup>+</sup> *see* set membership,  
 reversed  
 ox  
 . . . . . 264–267  
 . . . . . 206  
 . . . . . 201  
 . . . . . 201  
 . . . . . 262  
 . . . . . 268  
 ox back () . . . . . 200  
 oyster () . . . . . 262
- ## P
- P  
 . . . . . 270  
 . . . . . 294  
 package  
 . . . . . 294  
 . . . . . 312  
 package options  
 a (esvect) . . . . . 142  
 arrows (boisik) . . . . . 106  
 b (esvect) . . . . . 142  
 boondox (emf) . . . . . 165  
 c (esvect) . . . . . 142  
 cal (emf) . . . . . 165  
 calligra (emf) . . . . . 165  
 chorus (emf) . . . . . 165  
 cmr (emf) . . . . . 165  
 crescent (fge) . . . . . 137  
 d (esvect) . . . . . 142  
 e (esvect) . . . . . 142  
 f (esvect) . . . . . 142  
 frursive (emf) . . . . . 165  
 g  
 txfonts/pxfonts . . . . . 122  
 esvect . . . . . 142  
 german (keystroke) . . . 169  
 greek (babel) 20, 120, 121,  
 208  
 h (esvect) . . . . . 142  
 integrals (wasysym) . . . 55  
 mathcal (euscript) . . . . 162  
 mathscr  
 urwchancal . . . . . 162  
 euscript . . . . . 162  
 miamo (emf) . . . . . 165  
 new (old-arrows) . . . . . 112  
 noeuro (wasysym) . . . . 32  
 polutonikogreek (babel) 20,  
 120, 121  
 rsfs (emf) . . . . . 165  
 sans (dsfont) . . . . . 162
- scaled (CountriesOfEurope)  
 . . . . . 244  
 scr (rsfso) . . . . . 162  
 transform (emf) . . . . . 165  
 utf8x (inputenc) . . . . . 385  
 packages  
 abracas . . . . . 144, 387, 388  
 academicons 330, 331, 387,  
 388  
 accents . 136, 374, 387, 388  
 actuarialangle 145, 374, 387,  
 388  
 actuariesymbol . . . . . 374  
 adorn . 180, 190, 191, 197,  
 198, 387, 388  
 adfsymbols . 180, 186, 190,  
 196, 387  
 allrunes . . . . . 211, 387  
 AMS . . . . . 16, 20,  
 38, 54, 68, 82, 85, 91, 94,  
 95, 112, 119, 120, 122, 123,  
 126, 128, 136, 140, 145, 151,  
 155, 157, 163, 364, 365, 386  
 ambsby . . . . . 380  
 amfonts . . . . . 157, 162  
 amsmath 16, 65, 136, 369,  
 379  
 amssymb 16, 136, 157, 162,  
 208, 387, 388  
 amstext . . . . . 370, 372  
 apl . . . . . 169, 387  
 ar . . . . . 165, 387, 388  
 arcs . . . . . 30, 387, 388  
 arev . . . 180, 183, 184, 187,  
 213, 234, 284, 387  
 asapsym 181, 271, 307, 310,  
 320, 321, 327, 387, 388  
 ascii . . . 170, 382, 387, 388  
 astrosym . . . . . 335, 387  
 babel . . . 20, 120, 121, 208  
 bartel-chess-fonts . 361, 363,  
 387  
 bbding . . . . . 179,  
 182–184, 186, 187, 189, 195,  
 198, 365, 387, 388  
 bbm . . . . . 162, 387  
 bbold . . . . . 162, 387  
 bclogo . 311, 312, 387, 388  
 begriff . . . . . 153, 387  
 bigints . . . . . 58, 387, 388  
 bm . . . . . 380  
 boisik . . . . . 41, 47,  
 60, 76, 84, 89, 93, 105–107,  
 122–124, 126, 137, 156, 159,  
 192, 208, 213, 233, 387, 388




























































































































- braket . . . . . 127
- bullcntr . . . . . 269, 387, 388
- bulldenum . . . . . 269
- calligra . . . . . 163, 387, 388
- calrsfs . . . . . 162
- cancel . . . . . 139
- ccicons . . . . . 34, 387, 388
- ccllicenses . . . . . 34, 387, 388
- centernot . . . . . 370
- chancery . . . . . 387
- chemarr . . . . . 146, 387, 388
- chemarrow . . . . . 111, 146, 387
- ChemAr2e . . . . . 32, 119, 162, 163, 278, 279, 281, 387, 388
- circledsteps . . . . . 26, 373
- clock . . . . . 260, 387, 388
- cmll 37, 44, 67, 81, 125, 387
- cmupint . . . . . 64, 65, 387, 388
- colonequals 36, 81, 387, 388
- combelow . . . . . 30, 387, 388
- cookingsymbols . . . . . 287, 387, 388
- countriesofeuropa 242, 387, 388
- cryst . . . . . 358, 387
- cyriot . . . . . 207, 387, 388
- dancers . . . . . 352, 387
- dblaccnt . . . . . 373
- dice . . . . . 360, 387
- dictsym . . . . . 275, 387, 388
- dingbat 183, 184, 198, 342, 365, 387, 388
- DotArrow . . . . . 147, 387, 388
- dozenal 155, 269, 387, 388
- dsfont . . . . . 162, 387
- ds serif . . . . . 162, 387
- emf . . . . . 165, 387, 388
- emo 234, 252, 258, 261, 263, 278, 283, 285, 305, 321
- emoji . . . . . 234, 252, 258, 261, 263, 278, 283, 285, 305, 321
- endofproofwd . . . . . 126, 387
- epiolmec 208, 210, 387, 388
- epsdice . . . . . 235, 387, 388
- esint . . . . . 57, 387
- esrelation . . . . . 115, 149, 387
- esvect . . . . . 142, 387
- eufalg . . . . . 246, 387, 388
- eufrak . . . . . 162
- eurosym . . . . . 33, 387, 388
- euscript . . . . . 162, 387, 388
- extarrows . . . . . 146, 387, 388
- extpfeil . . . . . 147, 387, 388
- extraipa . . . . . 28, 387
- fc . . . . . 21, 26
- fclfont . . . . . 387
- fdsymbol 40, 41, 46, 59, 60, 73–75, 84, 88, 93, 100–105, 117, 123, 124, 130, 131, 137, 140, 152, 156, 159, 192, 213, 233, 387, 388
- feyn . . . . . 177, 387, 388
- fge 111, 125, 137, 154, 160, 387, 388
- figbas . . . . . 360, 387
- figchild . . . . . 259, 264, 267, 270, 279, 286, 287, 325, 331, 387, 388
- fixmath . . . . . 380
- fontawesome5 . . . . . 22, 32, 33, 157, 173, 176, 182, 183, 186, 188, 191, 196, 236, 240, 256, 259, 261, 263, 280, 284, 305, 308–310, 315, 319, 320, 323, 328, 387, 388
- fontenc 16, 20, 21, 26, 382, 384
- fontmifz . . . . . 318, 319, 329, 387, 388
- fontspec . . . . . 212, 385, 386
- fourier 33, 81, 122, 125, 133, 142, 184, 191, 257, 387
- frege . . . . . 154, 387, 388
- gensymb . . . . . 164
- go . . . . . 240, 387
- graphics . . . . . 148, 368
- graphicx . . . . . 30, 366, 368, 372
- greenpoint . . . . . 332, 387
- halloweenmath 52, 117, 138, 148–150, 387, 388
- hamnosys 272–275, 387, 388
- harmony 215, 217, 387, 388
- harpoon . . . . . 148, 387, 388
- hhcount 236, 268, 387, 388
- hieroglf . . . . . 202, 387, 388
- holtpolt . . . . . 151, 387
- hwemoji 234, 252, 258, 261, 263, 278, 283, 285, 305, 321
- ifsym . . . . . 164, 194, 195, 236, 258–260, 268, 270, 365, 367, 387, 388
- igo . . . . . 240, 387
- inputenc . . . . . 385
- isoent . . . . . 384
- junicode . . . . . 385, 387
- keystroke . . . . . 169, 387, 388
- knitting . . . . . 282, 387, 388
- knot . . . . . 348, 352, 387
- latexsym 37, 67, 82, 94, 157, 364, 387, 388
- lcircuit . . . . . 357, 358, 387
- lily&lyps . . . . . 212, 217–225, 230–232, 387
- linearA . . . . . 202, 387, 388
- linearb . . . . . 205, 206, 387, 388
- logic . . . . . 170
- logix 37, 44, 48, 52, 81, 82, 85, 91, 113–115, 125, 134, 135, 153, 161, 387, 388
- longdiv . . . . . 139
- magic . . . . . 361, 387
- manfnt . . . . . 255, 387, 388
- marvosym . . . . . 31, 32, 154, 166, 169, 171, 176, 182, 187, 255, 257, 279, 365
- mathabx . . . . . 36, 39, 45, 55, 69, 70, 83, 86, 91, 95, 96, 118, 123, 126–128, 136, 141, 155, 158, 166, 270, 364, 365, 387, 388
- mathbbol . . . . . 162, 163
- mathcomp . . . . . 154
- mathdesign 32, 43, 65, 125, 132, 160, 387
- mathdots . . . . . 136, 151, 153, 373, 387, 388
- mathrsfs . . . . . 162, 387
- mathspec . . . . . 120
- mathtools 36, 79, 112, 141, 145, 387, 388
- mbboard . . . . . 162, 163, 387
- mdwmath . . . . . 145, 387, 388
- metre 29, 135, 271, 387, 388
- milstd . . . . . 170, 387, 388
- mismath . . . . . 119, 387
- MnSymbol . . . . . 36, 39, 40, 45, 58, 59, 70–72, 83, 87, 92, 96–100, 115, 116, 122, 124, 128, 136, 139, 140, 152, 155, 158, 192, 212, 233, 387, 388
- moonphase . . . . . 334, 387
- musicography 216, 387, 388
- musicgre . . . . . 215
- musicxlit . . . . . 215
- musicxper . . . . . 215
- musicxtex . . . . . 387, 388
- nath . . . . . 127, 133, 387
- nicefrac . . . . . 160, 387, 388
- niceframe . . . . . 339–342, 352
- nkarta . . . . . 333, 387
- ntheorem . . . . . 157
- ogonek . . . . . 30, 387, 388
- old-arrows . . . . . 112, 387
- oplotsymb . . . . . 196–198, 387, 388

- overarrows . . . 144, 387, 388
- overrightarrow . . . 139, 387
- pdfMsym . . . 43, 66, 67, 81, 110, 111, 138, 143, 147, 148
- pdfmsym . . . . . 387
- pgfornament 343, 346, 348, 387, 388
- phaistos . . . . 200, 387, 388
- phonetic . . . 25, 29, 368, 387
- pict2e . . . . . 165
- pifont . . . 21, 179, 182, 184, 186–188, 190, 195, 198, 332, 339, 357, 368, 387, 388
- pipgen . . . . . 278, 387, 388
- plimsoll 165, 370, 387, 388
- pmboxdraw . . . 276, 387, 388
- polynom . . . . . 139
- prodint . . . . . 66, 387
- protosem . . . 201, 387, 388
- psnfss . . . . . 188
- PSTricks . . . . . 312
- pxfonts 36, 39, 56, 69, 82, 86, 95, 118, 121–123, 157, 158, 162, 233, 364, 382
- quantikz 127, 171, 387, 388
- realhats . . . . 138, 387, 388
- recycle . . . . . 280, 387
- relsizel . . . . . 30
- resmes . . . . . 44, 387, 388
- rojud . . . 245, 246, 387, 388
- rotating . . . . . 34, 169
- rsfso . . . . . 162, 387
- rubikcube . . . 329, 387, 388
- sacsymb . . . . 329, 387, 388
- sarabian . . . . 207, 387, 388
- savesym . . . . . 364
- scalarel . . . . . 372
- scsnowman . . . 309, 387, 388
- semaphor . . . 355, 357, 387
- semtrans . . . 25, 30, 387, 388
- shuffle . . . . . 44, 387, 388
- sillypage . . . . 308, 387, 388
- simplewick . . . . . 375
- simpsons . . . . . 306, 387
- skak . . . . . 239, 387, 388
- skull . . . . . 270, 387, 388
- slashed . . . . . 370
- soyombo . . . . 281, 387, 388
- stackengine . . . . . 372
- starfont . . . . 168, 387, 388
- staves . . . . . 276, 387
- steinmetz . . . 165, 387, 388
- stix 42, 43, 47, 48, 53, 61, 62, 77, 78, 84, 89, 90, 93, 107, 109, 110, 118, 122–124, 126, 131, 137, 141, 152, 155, 156, 159, 160, 166, 169, 176, 193, 194, 213, 234, 236, 387, 388
- stmaryrd 38, 54, 68, 82, 91, 95, 112, 118, 126, 128, 365, 370, 386–388
- svrsymbols . . . 177, 387, 388
- t4phonet . . . 25, 29, 387, 388
- teubner 32, 153, 208, 272, 387, 388
- textcomp 16, 19, 26, 31, 33, 34, 94, 135, 160, 165, 212, 253, 364, 382, 384, 387, 388
- textgreek 20, 121, 387, 388
- tfrupree . . . . . 32, 387, 388
- TikZ . . . . . 17, 26, 167, 176, 181, 183–185, 187–190, 196–199, 213, 234–238, 241, 248, 249, 254, 256, 258–260, 267, 268, 270, 279, 281, 283, 287–290, 307, 309, 310, 312, 314, 329, 331, 346, 348, 373
- tikzsymbols . . . 288–290, 387, 388
- timing . . . . . 164
- tipa 22, 23, 25, 26, 28, 29, 368, 387, 388
- tipx . . . . . 23, 387, 388
- trfsigns . . . 80, 124, 148, 387
- trsym . . . . . 80, 387, 388
- turnstile . . . 79, 80, 387, 388
- twemojis 234, 249, 252, 258, 261–263, 278, 283–285, 290, 305, 320, 321, 387–389
- txfonts . . . . . 36, 39, 56, 69, 82, 86, 95, 118, 121–123, 157, 158, 162, 233, 364, 366, 382, 387, 388
- type1cm . . . . . 366
- typicons 156, 171, 172, 182, 183, 185, 188, 191, 255, 256, 259, 261, 308, 309, 314, 322, 328, 387, 388
- ucs . . . . . 385
- ulsy . . . . . 44, 118, 367, 387
- umranda . . . . 339, 340, 387
- umrandb . . . . 340, 341, 387
- underscore . . . . . 18
- undertilde . . . 144, 387, 388
- units . . . . . 160
- universa 195, 257, 387, 388
- upgreek . . . 20, 121, 387, 388
- upquote . . . . . 382
- url . . . . . 382
- urwchancal . . . 162, 163, 387
- ushort . . . . . 145, 387, 388
- utfsym . . . . . 167, 176, 181, 183–185, 187–190, 196, 199, 213, 234–238, 241, 254, 256, 258, 260, 268, 279, 281, 287, 289, 290, 307, 310, 312, 314, 387, 388
- vietnam . . . . . 387
- vntex . . . . . 21, 26
- wasysym . . . . . 25, 32, 35, 38, 55, 68, 82, 86, 151, 157, 164, 166, 168, 176, 187, 189, 192, 212, 253, 365, 367, 387, 388
- webomints . . . 338, 339, 387
- worldflags 247–249, 283, 387
- wsuipa 24, 28, 31, 365, 368, 373, 374, 387, 388
- xfakebold . . . 380, 387, 388
- xfrac . . . . . 160
- yfonts . . . 162, 163, 387, 388
- yhmath 137, 139, 144, 153, 373, 387
- page (■) . . . . . 313
  - facing up
    -  . . . . . 294
    -  . . . . . 313
  - landscape (▢) . . . . . 270
  - multiple (■) . . . . . 313
  - portrait (▭) . . . . . 270
  - with circled text (⊠) . . . 313
  - with curl
    -  . . . . . 294
    -  . . . . . 313
- PageLines (⚡) . . . . . 315–318
- pager
  -  . . . . . 323–325
  -  . . . . . 294
  -  . . . . . 314
- paint roller (🔧) . . . . . 323–325
- paintbrush
  -  . . . . . 323–325
  -  . . . . . 323–325
  -  . . . . . 322
  -  . . . . . 294
  -  . . . . . 184
- Pakin, Scott . . . 1, 371, 374, 386
- Palatino (font) . . . . . 360
- palette (🎨) . . . . . 323–325
- PalFed (👤) . . . . . 315–318
- Palladio (font) . . . . . 360
- Pallas (♀) . . . . . 168
- palm
  - 🌴 . . . . . 201
  - 🌴 . . . . . 201

- pan  
 ..... 286–287  
 ..... 288  
 ..... 285  
 pancakes  ..... 284  
 panda  
 ..... 262  
 ..... 268  
 paper ..... *see* page  
 paperclip ..... 311–312  
 ..... 311–312  
 ..... 323–325  
 ..... 322  
 ..... 294  
 ..... 313  
 multiple, linked  
 ..... 303  
 ..... 312  
 papyrus  ..... 200  
 par + ..... *see* ampersand,  
 inverted  
 parachute  
 ..... 323–325  
 ..... 294  
 paragraph mark  *see* pilcrow  
 parallel ()+ 54, 67, 71, 73, 77,  
 129  
 negated ()+ 68, 73, 75, 76,  
 78  
 short ()+ 68, 70, 73, 76, 77  
 short, negated ()+ 68, 72,  
 75, 76, 78  
 similar () ..... 77  
 slanted ()+ ..... 69, 81  
 slanted backward () . 69  
 slanted backward, negated  
 () ..... 69  
 slanted, negated ()+ . 69,  
 81  
 parallel port () ..... 169  
 parallelogram () . . . 193–194,  
 358–359  
 filled () ..... 194  
 parentheses ..... *see* delimiters  
 dingbat ()+ ..... 199  
 sans serif ()+ ..... 154  
 parking  ..... 328–329  
 parrot  
 ..... 264–267  
 ..... 262  
 part alternation mark () . 294  
 part of (3) ..... 368  
 partial derivative ( $\partial$ )<sup>+</sup> 123, 125  
 slashed ( $\partial$ ) ..... 123  
 partial meet contraction ( $\leq$ ) *see*  
 less than, much, underlined  
 particle-physics symbols 177–178  
 partly sunny  
 ..... 311–312  
 ..... 259  
 party popper  
 ..... 294  
 ..... 312  
 pass  
 ..... 331  
 ..... 331  
 passport  ..... 328–329  
 passport control ..... 254  
 ..... 320  
 ..... 254  
 past () ..... 49  
 deontic () ..... 50  
 doxastic () ..... 51  
 factual () ..... 51  
 logical () ..... 48  
 temporal () ..... 49  
 Pastafarianism  ..... 310  
 paste  ..... 173–175  
 Patreon  ..... 315–318  
 patron  
 ..... 208–210  
 ..... 208–210  
 pause  
 ..... 173–175  
 ..... 173–175  
 ..... 173–175  
 ..... 255  
 ..... 255  
 ..... 294  
 paw  ..... 328–329  
 paw prints  
 ..... 262  
 ..... 312  
 PayPal  
 ..... 315–318  
 ..... 315–318  
 PDF ..... 43, 66, 67,  
 81, 111, 138, 143, 147, 148,  
 212, 234, 252, 258, 261, 263,  
 278, 283, 285, 305, 308, 321  
 .pdf files ..... 384  
 pdfLATEX ..... 43, 66, 67,  
 81, 111, 138, 143, 147, 148,  
 234, 246, 252, 258, 261, 263,  
 278, 283, 285, 305, 321, 385  
 pdfMsym (package) . 43, 66, 67,  
 81, 110, 111, 138, 143, 147,  
 148  
 pdfmsym (package) ..... 387  
 peace ..... 290–305, 311–312,  
 328–329  
 ..... 257  
 ..... 198  
 ..... 311–312  
 ..... 328–329  
 ..... 294  
 ..... 290  
 peach  
 ..... 284  
 ..... 287  
 peacock  
 ..... 264–267  
 ..... 262  
 peanuts  ..... 284  
 pear  
 ..... 284  
 ..... 287  
 pedal  
 engage  
 ..... 214  
 ..... 214  
 release  
 ..... 214  
 ..... 214  
 pedestrian  
 ..... 200  
 ..... 254  
 peeler  ..... 288  
 peg  ..... 201  
 pen ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 294  
 ..... 299  
 ..... 293  
 ..... 184  
 ..... 184  
 pencil ..... 183, 184

-  ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 311–312  
 ..... 183  
 ..... 325–327  
 ..... 325–327  
 ..... 183  
 ..... 183  
 ..... 294  
 ..... 184  
 ..... 184  
 ..... 184  
 ..... 184  
 and ruler () ..... 324
- penguin  
 ..... 264–267  
 ..... 262  
 ..... 268
- penis () ..... 208–210  
 pennant ..... *see* flag  
 Penny Arcade () .. 315–318  
 Penrose triangle () ..... *see* triangle, impossible  
 pentagon ()<sup>+</sup> ..... 192–194, 196–197  
   crossed () ..... 197  
   dotted () ..... 197  
   filled ()<sup>+</sup> ..... 194, 197  
   half filled  
      ..... 197  
      ..... 197  
      ..... 197  
      ..... 197  
   horizontally divided () 197  
   irregular () ..... 170  
   quartered () ..... 197  
   vertically divided () . 197  
 pentagram ()<sup>+</sup> ..... *see* star, pentagram  
 people ..... 290–305, 307, 308, 320–321, 328–329  
   carrying () ..... 328–329  
   holding hands () ... 294  
   hugging () ..... 294  
   with arrows () 328–329  
   with bunny ears () .. 294  
   wrestling () ..... 294  
 per mill (‰)<sup>+</sup> 19, 35, 154, 164, 384  
 per ten thousand (‱)<sup>+</sup> .. *see* permyriad  
 per thousand (‰)<sup>+</sup> *see* per mill  
 PerByte () ..... 315–318  
 percent  
   % ..... 18, 381  
   % ..... 37  
   % ..... 157  
   % ..... 157  
 perch () ..... 264–267  
 percussion ..... 215  
 performing arts  
    ..... 294  
    ..... 313  
 period (.) ..... 154  
   centered (·)<sup>+</sup> ..... 19, 383  
 Periscope () ..... 315–318  
 Perl ( ) ..... 318–319  
 permanent paper () ..... 279  
 permyriad (‱)<sup>+</sup> ..... 19, 154  
 perpendicular (⊥)<sup>+</sup> ..... *see* turnstile, up  
 person () ..... 294  
   deaf () ..... 296  
   getting haircut () ... 294  
   getting massage () .. 294  
   in bed () ..... 295  
   in lotus position () .. 295  
   in manual wheelchair () .  
     ..... 295  
   in motorized wheelchair ()  
     ..... 295  
   in steamy room () .. 295  
   in suit levitating () . 295  
   in tuxedo () ..... 295  
   old () ..... 293  
   raising both hands in celebration () ..... 289  
   wearing turban () .. 295  
   with blond hair () .. 307  
   with folded hands () 289  
   with skullcap () ..... 295  
   with veil () ..... 295  
   with white cane () .. 295  
 peso (₱) ..... 31  
 petri dish () ..... 295
- pfund (℥)<sup>+</sup> ..... 32  
 pgfornament (package) 343, 346, 348, 387, 388  
 Phabricator () ..... 315–318  
 phaistos (package) 200, 387, 388  
 Phaistos disk ..... 200  
 pharmaceutical prescription *see* recipe  
 phasor () ..... 165  
 phi  
   lowercase (φ)<sup>+</sup> . 20, 23, 24, 120, 121  
   lowercase variant (ϕ)<sup>+</sup> 120–122  
   uppercase (Φ)<sup>+</sup> . 20, 120, 121  
 Phil Papers  
    ..... 330–331  
    ..... 330–331  
 Phoenix Framework ( ) . 315–318  
 Phoenix Squadron () 315–318  
 phonetic (package) . 25, 29, 368, 387  
 phonetic accents  
   advanced () . *see* accents, plus below  
   advanced tongue root () *see* accents, tack below, left  
   apical () ..... *see* accents, bridge below, inverted  
   breathy voiced ()<sup>+</sup> .. *see* accents, diæresis below  
   centralized ()<sup>+</sup> ..... *see* accents, diæresis  
   creaky voiced ()<sup>+</sup> ..... *see* accents, tilde below  
   dental ()<sup>+</sup> .. *see* accents, bridge below  
   laminal () ..... *see* accents, square below  
   less rounded () *see* accents, half ring below, left  
   linguolabial () *see* accents, seagull below  
   lowered () .. *see* accents, tack below, down  
   mid-centralized () ..... *see* accents, X  
   more rounded () . *see* accents, half ring below, right  
   nasalized ()<sup>+</sup> *see* accents, tilde  
   no audible release () . *see* accents, angle, left

- non-syllabic (◻)<sup>+</sup> . *see* accents, breve below, inverted raised (◻) *see* accents, tack below, up
- retracted (◻)<sup>+</sup> *see* accents, bar below
- retracted tongue root (◻) *see* accents, tack below, right
- suprasegmental, extra short (◻)<sup>+</sup> . . *see* accents, breve syllabic (◻)<sup>+</sup> . *see* accents, vertical line below
- tone, extra high (◻)<sup>+</sup> . *see* accents, acute, double
- tone, extra low (◻)<sup>+</sup> . . *see* accents, grave, double
- tone, falling (◻)<sup>+</sup> . . . . *see* accents, circumflex
- tone, high (◻)<sup>+</sup> *see* accents, acute
- tone, high rising (◻) . . *see* accents, high rising tone
- tone, low (◻)<sup>+</sup> *see* accents, grave
- tone, low rising (◻) . . . *see* accents, low rising tone
- tone, mid (◻)<sup>+</sup> *see* accents, macron
- tone, rising (◻)<sup>+</sup> . . . . *see* accents, caron
- tone, rising and falling (◻) . . . *see* accents, rising and falling tone
- velarized/pharyngealized (◻)<sup>+</sup> . . . *see* accents, tilde overlay
- voiced (◻) . . . *see* accents, caron below
- voiceless (◻)<sup>+</sup> . *see* accents, ring below
- phonetic symbols . . . 22–25, 30
- phonon (f̣) . . . . . 178
- photo and video (📷) . 173–175
- photon . . . . . 164, 177–178
- ~~~~~ . . . . . 164
- f . . . . . 178
- f̣ . . . . . 178
- PHP
- 📄 . . . . . 315–318
- 📄 . . . . . 318–319
- 📄 . . . . . 318–319
- physical symbols . . . . . 164
- pi
  - lowercase (π)<sup>+</sup> 20, 120–122, 156, 368
  - lowercase variant (ϖ)<sup>+</sup> 120–122
  - uppercase (Π)<sup>+</sup> . 20, 120, 121
  - pi fonts . . . . . 368
  - piano (p) . . . . . 219, 232
  - Piazza
  - 📍 . . . . . 330–331
  - 📍 . . . . . 330–331
  - pick (🔪) . . . . . 295
  - pict2e (package) . . . . . 165
  - pie (🥧) . . . . . 284
  - pie chart
  - 🥧 . . . . . 173–175
  - 🥧 . . . . . 171–172
  - 🥧 . . . . . 171–172
  - Pied Piper
  - 🎅 . . . . . 315–318
  - 🎅 . . . . . 315–318
  - 🎅 . . . . . 315–318
  - 🎅 . . . . . 315–318
  - 🎅 . . . . . 315–318
  - pierce (🗡) . . . . . 208–210
  - pifont (package) . . 21, 179, 182, 184, 186–188, 190, 195, 198, 332, 339, 357, 368, 387, 388
  - pig
  - 🐷 . . . . . 264–267
  - 🐷 . . . . . 264–267
  - 🐷 . . . . . 264–267
  - 🐷 . . . . . 264–267
  - 🐷 . . . . . 264–267
  - 🐷 . . . . . 264–267
  - 🐷 . . . . . 264–267
  - 🐷 . . . . . 264–267
  - 🐷 . . . . . 343–346
  - 🚩 . . . . . 206
  - 🍷 . . . . . 262
  - 🍷 . . . . . 262
  - 🍷 . . . . . 268
  - 🍷 . . . . . 268
  - pig nose
  - 🐷 . . . . . 262
  - 🐷 . . . . . 312
  - piggy bank (🐷) . . . . . 323–325
  - pigpen (package) . 278, 387, 388
  - pigpen cipher . . . . . 278
  - pilcrow
  - ¶<sup>+</sup> . . . . . 124, 170
  - ¶<sup>+</sup> . . . . . 19, 22, 36, 383
  - ¶ . . . . . 34
  - ¶ . . . . . 199
  - pill
  - 💊 . . . . . 295
  - 💊 . . . . . 312
  - pills (📄) . . . . . 319
  - pilot (👨)<sup>+</sup> . . . . . 291, 295, 303
  - pimiento (🌶) . . . . . 286–287
  - pin (📌) . . . . . 322
  - pine decoration
  - 🌲 . . . . . 295
  - 🌲 . . . . . 312
  - pineapple
  - 🍍 . . . . . 286–287
  - 🍍 . . . . . 284
  - 🍍 . . . . . 287
  - ping pong
  - 🏓 . . . . . 240
  - 🏓 . . . . . 295
  - 🏓 . . . . . 241
  - Pinterest
  - 📌 . . . . . 315–318
  - 📌 . . . . . 315–318
  - 📌 . . . . . 315–318
  - 📌 . . . . . 314
  - 📌 . . . . . 314
  - pinwheel (🚂) . . . . . 325–327
  - pion . . . . . 177–178
  - minus (π<sup>-</sup>) . . . . . 178
  - null (π<sup>o</sup>) . . . . . 178
  - plus (π<sup>+</sup>) . . . . . 178
  - pipe (|)<sup>+</sup> . . . . *see* vertical bar
  - circular (⊙) . . . . . 171
  - rectangular (▣) . . . . . 171
  - Pisces (♊)<sup>+</sup> . . . . 166–168, 295, 335–338
  - pistol (🔫) . . . . . 313
  - \Pisymbol . . 332–342, 348–363, 368
  - pitchfork (⚡)<sup>+</sup> . 68, 76, 77, 116, 117, 149, 150, 158
  - bar handle (⚡)<sup>+</sup> . . . 76, 77
  - extensible (⚡)<sup>+</sup> . . . . . 149
  - negated (⚡)<sup>+</sup> . . . 116, 117
  - truncated handle (⚡)<sup>+</sup> 76, 77
  - truncated handle, negated (⚡)<sup>+</sup> . . . . . 78
  - Pitman’s base 12 symbols 155, 269

- pizza  
 ..... 323–325  
 ..... 284  
 ..... 287
- piñata () ..... 295
- placard () ..... 295
- place of worship  
 ..... 310  
 ..... 295  
 ..... 254
- Planck’s constant ( $\hbar$ ) *see* barred letters, h
- planet  
 ..... 279  
 ..... 279  
 ..... 279  
 ..... 279  
 ..... 279  
 ..... 279  
 ..... 279
- planets () 166–168, 279, 335–338
- plant  
 ..... 208–210  
 ..... 201  
 ..... 201
- plants ..... 312–314
- plasmon ( $\sim e^-$ ) ..... 178
- play () ..... 208–210
- Play Framework  
 ..... 318–319  
 ..... 318–319
- playing card suits 198, 233, 234, 311–312
- club ()<sup>+</sup> ... 170, 233, 234
- club, hollow ()<sup>+</sup> 233, 234
- diamond  
<sup>+</sup> ..... 233, 234  
 ..... 234
- diamond, filled ()<sup>+</sup> . 170, 233, 234
- heart  
<sup>+</sup> ..... 233, 234  
 ..... 234
- heart, filled ()<sup>+</sup> 170, 233, 234
- spade ()<sup>+</sup> . 170, 233, 234, 311–312
- spade, hollow ()<sup>+</sup> 233, 234
- playing cards ..... 233–235
- ace of clubs () ..... 235
- ace of diamonds () .. 235
- ace of hearts () .... 235
- ace of spades () .... 235
- back () ..... 235
- black joker () ..... 235
- eight of clubs () .... 235
- eight of diamonds () . 235
- eight of hearts () ... 235
- eight of spades () ... 235
- five of clubs () ..... 235
- five of diamonds () .. 235
- five of hearts () .... 235
- five of spades () .... 235
- flower  
 ..... 299  
 ..... 313
- fool () ..... 235
- four of clubs () .... 235
- four of diamonds () . 235
- four of hearts () .... 235
- four of spades () .... 235
- jack of clubs () .... 235
- jack of diamonds () . 235
- jack of hearts () .... 235
- jack of spades () ... 235
- king of clubs () .... 235
- king of diamonds () . 235
- king of hearts () .... 235
- king of spades () ... 235
- knight of clubs () ... 235
- knight of diamonds () 235
- knight of hearts () .. 235
- knight of spades () .. 235
- nine of clubs () .... 235
- nine of diamonds () . 235
- nine of hearts () .... 235
- nine of spades () ... 235
- queen of clubs () ... 235
- queen of diamonds () 235
- queen of hearts () .. 235
- queen of spades () .. 235
- red joker () ..... 235
- seven of clubs () ... 235
- seven of diamonds () 235
- seven of hearts () ... 235
- seven of spades () .. 235
- six of clubs () ..... 235
- six of diamonds () .. 235
- six of hearts () ..... 235
- six of spades () ..... 235
- ten of clubs () ..... 235
- ten of diamonds () .. 235
- ten of hearts () .... 235
- ten of spades () .... 235
- three of clubs () .... 235
- three of diamonds () 235
- three of hearts () ... 235
- three of spades () ... 235
- trump 1 () ..... 235
- trump 2 () ..... 235
- trump 3 () ..... 235
- trump 4 () ..... 235
- trump 5 () ..... 235
- trump 6 () ..... 235
- trump 7 () ..... 235
- trump 8 () ..... 235
- trump 9 () ..... 235
- trump 10 () ..... 235
- trump 11 () ..... 235
- trump 12 () ..... 235
- trump 13 () ..... 235
- trump 14 () ..... 235
- trump 15 () ..... 235
- trump 16 () ..... 235
- trump 17 () ..... 235
- trump 18 () ..... 235
- trump 19 () ..... 235
- trump 20 () ..... 235
- trump 21 () ..... 235
- two of clubs () ..... 235
- two of diamonds () .. 235
- two of hearts () .... 235
- two of spades () .... 235
- white joker () ..... 235
- PlayStation () ..... 315–318
- plimsoll (package) 165, 370, 387, 388
- Plimsoll line () .... 165, 370
- Plone () ..... 318–319
- plug  
 ..... 323–325  
 ..... 322
- plumed head () ..... 200
- plunger () ..... 296
- plus  
<sup>+</sup> ..... 37, 39–43, 55, 58, 60, 154, 186, 187, 198, 211, 333–334  
**+** ..... 42  
**bold** (**+**)<sup>+</sup> . 156, 157, 186, 199, 296

- double
  - # ..... 43
  - ‡ ..... 211
- hollow (⊕) ..... 156
- open center
  - ⊕ ..... 186
  - ⊕ ..... 186
- outlined (⊕) ..... 186
- triple
  - # ..... 42
  - ‡ ..... 211
- with circle
  - ‡<sup>+</sup> ..... 39, 42, 43
  - ⊕<sup>+</sup> ..... 39, 42
- with dot
  - ‡<sup>+</sup> ..... 37–39, 41–43
  - ‡<sup>+</sup> ..... 41, 43
- with equal sign
  - ± ..... 43
  - ± ..... 43
- with hat (⊕) ..... 43
- with similarity sign
  - ‡ ..... 43
  - ‡ ..... 43
- with subscripted 2 (±<sub>2</sub>) ..... 43
- with triangle (‡)<sup>+</sup> ..... 42, 43
- plus or minus (±)<sup>+</sup> ..... 37, 40–43, 160, 383
- Pluto ..... 335–338
  - ♃ ..... 166
  - ♃ ..... 166
  - ♃ ..... 168
  - ♃ ..... 168
  - ♃ ..... 166
  - ♃ ..... 167
- pmbxdraw (package) ..... 276, 387, 388
- Pocket (👛) ..... 315–318
- pocket calculator (👛) ..... 312
- podcast (🎧) ..... 173–175
- point of interest
  - 📍 ..... 328
  - 📍 ..... 328
- pointing finger ..... *see* hand
- Poland (🇵🇱) ..... 243
- polar bear (🐻) ..... 262
- polariton (⌘) ..... 178
- polaron (⌘<sup>+</sup>) ..... 178
- police car
  - 🚓 ..... 320
  - 🚓 ..... 320
  - 🚓 ..... 254
  - 🚓 ..... 254
- police car light
  - 🚓 ..... 320
- 🍷 ..... 254
- police officer (👮)<sup>+</sup> ..... 291, 296, 303, 307
- policeman’s hat, as math-mode
  - accent (👮) ..... 138
- poll
  - 🗳️ ..... 173–175
  - 🗳️ ..... 173–175
- polygon (📐) ..... 173–175
- polygons ..... 48–52, 192–194, 196–197, 225–230, 333–334, 358–359
- polynom (package) ..... 139
- polynomial division ..... 139
- polytonic Greek ..... 20, 120, 121
- pomega (ω)<sup>+</sup> ..... *see* pi, lowercase variant
- poo
  - 💩 ..... 328–329
  - 💩 ..... 328–329
  - 💩 ..... 295
  - 💩 ..... 313
  - storm (🌩️) ..... 328–329
- poodle
  - 🐕 ..... 262
  - 🐕 ..... 268
- popcorn
  - 🍿 ..... 284
  - 🗑️ ..... 287
- popsicle (🍷) ..... 286–287
- portable stereo (🔊) ..... 312
- portato
  - down (⇩) ..... 220
  - up (⇧) ..... 220
- portrait (🖼️) ..... 173–175
- Portugal (🇵🇹) ..... 243
- Poseidon (♃) ..... 168
- positron (e<sup>+</sup>) ..... 178
- possibility (♦) ..... 49
  - deontic (♦) ..... 50
  - doxastic (♦) ..... 51
  - factual (♦) ..... 51
  - logical (♦) ..... 48
  - temporal (♦) ..... 49
- post office
  - 📮 ..... 302
  - 📮 ..... 296
  - 📮 ..... 314
  - 📮 ..... 314
- postal horn
  - 📯 ..... 296
  - 📯 ..... 312
- postal mark (⇄)<sup>+</sup> ..... *see* turnstile, double bar, down
- postbox ..... *see* mailbox
- PostgreSQL
  - 🐘 ..... 318–319
  - 🐘 ..... 318–319
- PostScript ..... 121, 163, 179, 367, 368, 379
- PostScript fonts ..... 179
- pot (🍲) ..... 288
- pot of food
  - 🍲 ..... 285
  - 🍲 ..... 287
- potato
  - 🥔 ..... 286–287
  - 🥔 ..... 285
- potted plant (🌱) ..... 296
- pouch (👛) ..... 281
- pound
  - £ ..... 32
  - £<sup>+</sup> ..... 19, 31, 382, 383
  - math mode (£)<sup>+</sup> ..... 36, 123, 124
- pound banknote ..... *see* banknote, pound
- pound sign (#)<sup>+</sup> ..... *see* hash
- putting (👉)<sup>+</sup> ..... 291, 295, 303
- power
  - 🔌 ..... 173–175
  - 🔌 ..... 255
  - 🔌 ..... 255
- power set (℘) ..... 124
- praise
  - 👏 ..... 201
  - 👏 ..... 201
- pray (🙏) ..... 310
- prayer beads
  - 📿 ..... 296
  - 📿 ..... 312
- praying mantis (🦗) ..... 264–267
- precedes (←)<sup>+</sup> ..... 67, 71, 73, 77, 81
  - closed (←) ..... 70
  - double
    - ⌵ ..... 69
    - ⌵<sup>+</sup> ..... 76, 78
  - negated (↯)<sup>+</sup> ..... 68, 70, 72, 75, 76, 78, 81
  - or approximately equal to (≈)<sup>+</sup> ..... 68, 69, 71, 73, 76, 78
  - or approximately equal to, negated (≉)<sup>+</sup> ..... 69, 70, 72, 75



or equal to  
 $\leq^+$  . . . 67, 71, 74, 78, 81  
 $\succ^+$  68, 69, 71, 73, 76, 78  
 $\geq^+$  . . . . . 69, 74, 78

or equal to, negated  
 $\not\leq^+$  . . . 68, 70, 72, 75, 76, 78, 81  
 $\not\succ^+$  . . . 69, 70, 72, 75, 78  
 $\not\geq^+$  . . . . . 69, 75

or not approximately equal to  $\approx^+$  68, 70, 72, 74, 76, 78



or not equal to  
 $\not\leq^+$  . . . . . 69, 74–76, 78  
 $\not\succ^+$  . . . . . 70, 74, 75, 78



or not similar to  $\sim^+$  68, 70, 72, 74, 76, 78

or similar to  $\lesssim^+$  68, 69, 71, 74, 76, 78

or similar to, negated  $\not\lesssim^+$  . . . . . 69, 70, 72, 75


under relation  $\prec^+$  76, 78


pregnant woman  
 . . . . . 307  
 . . . . . 296

Preregistered  
 . . . . . 330–331  
 . . . . . 330–331



prescription . . . . . *see* recipe



present-value symbols 145, 374







pretzel () . . . . . 285

priest () . . . . . 208–210

prime ( $\prime$ )<sup>+</sup> . . . . . 155, 157–159  
 backward ( $\lrcorner$ )<sup>+</sup> 155, 157–159  
 backward double ( $\lrcorner\lrcorner$ ) . . 155  
 backward triple ( $\lrcorner\lrcorner\lrcorner$ ) . . 155  
 double ( $\prime\prime$ )<sup>+</sup> . . . . . 155, 158  
 quadruple ( $\prime\prime\prime\prime$ )<sup>+</sup> . 155, 158  
 triple ( $\prime\prime\prime$ )<sup>+</sup> . . . . . 155, 158

prince  
 . . . . . 208–210  
 . . . . . 296

princess  
 . . . . . 296  
 . . . . . 307

printer  
 . . . . . 169  
 . . . . . 173–175  
 . . . . . 322  
 . . . . . 296  
 . . . . . 312  
 . . . . . 312

printer’s fists . . . . . *see* hand

printer’s flowers *see* fleurons and flowers


probability limit (plim) . . . *see*  $\xrightarrow{n \rightarrow \infty}$


$\backslash\text{DeclareMathOperator}$

prodint (package) . . . . . 66, 387

product  
 $\prod^+$  . . . . . 39, 54, 59–61  
 $\times$  . . . . . 57

horizontally extensible ( $\prod$ ) . . . . . 67

Product Hunt () . . . 315–318

project diagram () . 173–175

Project Gutenberg . . . . . 368

projection ( $\langle \!| \! \rangle$ ) . . . . . 171

projective space ( $\mathbb{P}$ ) . . . . . *see* alphabets, math

proof, end of . . . 125, 126, 157, 159–160



proper subset ( $\subset$ )<sup>+</sup> *see* subset, strict

proper superset ( $\supset$ )<sup>+</sup> . . . . . *see* superset, strict

proper vertices . . . . . 177



property line ( $\mathfrak{P}$ ) . . . . . 159

proportion ( $\therefore$ )<sup>+</sup> . . *see* dot, four

proportionality ( $\propto$ )<sup>+</sup> 67, 68, 70, 71, 74, 76, 78, 158  
 bidirectional ( $\infty$ ) . . . . . 39  
 bidirectional, diagonal  
 . . . . . 40  
 . . . . . 40  
 bidirectional, vertical ( $\delta$ ) 40  
 down ( $\delta$ ) . . . . . 71  
 reversed ( $\infty$ )<sup>+</sup> . 70, 73, 74  
 up ( $\delta$ ) . . . . . 71

protein ( $\mathfrak{P}$ ) . . . . . 177

proto-Semitic symbols . . . . . 201

Protocols  
 . . . . . 330–331  
 . . . . . 330–331

proton ( $p^+$ ) . . . . . 177

proteom (package) 201, 387, 388



$\backslash\text{ProvidesPackage}$  . . . . . 387

pseudographics . . . . . 276



psi  
 lowercase ( $\psi$ )<sup>+</sup> 20, 120, 121  
 uppercase ( $\Psi$ )<sup>+</sup> . 20, 120, 121



psnfss (package) . . . . . 188



PSTricks (package) . . . . . 312

PsyArXiv  
 . . . . . 330–331  
 . . . . . 330–331

Psyche ( $\Psi$ ) . . . . . 168

Publons  
 . . . . . 330–331  
 . . . . . 330–331

PubMed  
 . . . . . 330–331  
 . . . . . 330–331

PubPeer  
 . . . . . 330–331  
 . . . . . 330–331


pull back ( $\triangleleft$ )<sup>+</sup> . . . . . 41, 78



pullback diagrams . . . . . 372

pulse diagram symbols . . . . . 164

pumpkin . . . *see* jack-o’-lantern

punctuation . . . . . 21, 22







puppy () . . . . . 264–267





purse  
 . . . . . 296  
 . . . . . 281

push out ( $\vDash$ )<sup>+</sup> . . . . . 41, 78


Pushed ( $\nabla$ ) . . . . . 315–318


pushout diagrams . . . . . 372

pushpin  
 . . . . . 323–325  
 . . . . . 296  
 . . . . . 297  
 . . . . . 313  
 . . . . . 313  
 . . . . . 312


puzzle piece  
 . . . . . 323–325  
 . . . . . 322  
 . . . . . 296  
 . . . . . 296

pxfonts (package) . . . . . 36, 39, 56, 69, 82, 86, 95, 118, 121–123, 157, 158, 162, 233, 364, 382

pyramid () . . . . . 325–327


Python ()<sup>+</sup> . . . . . 315–319


Q



Q () . . . . . 270

QED . . . . . *see* end of proof

qoppa  
 lowercase ( $\text{q}$ )<sup>+</sup> . . . . . 208  
 uppercase ( $Q$ ) . . . . . 208

QQ () . . . . . 315–318

QR code () . . . . . 173–175













quadrifolium  
 . . . . . 255  
 . . . . . 255






















quadrupole ( $\mathfrak{Q}$ ) . . . . . 177

















































































quantifiers . . . . . 125  
 quantikz (package) 127, 171, 387, 388  
 quantum-mechanics notation 171  
 quark (*q*) . . . . . 177  
   *b* (*b*) . . . . . 177  
   *c* (*c*) . . . . . 177  
   *d* (*d*) . . . . . 177  
   *s* (*s*)<sup>+</sup> . . . . . 177–178  
   *t* (*t*) . . . . . 177  
   *u* (*u*) . . . . . 177  
 quarter note ( $\text{♩}$ )<sup>+</sup> . . . . 212, 213, 215–218  
   dotted ( $\text{♩}$ )<sup>+</sup> . . . . 216–218  
   double dotted ( $\text{♩}$ )<sup>+</sup> . 217, 218  
   rest ( $\text{♯}$ )<sup>+</sup> . . . . 214, 215, 219  
   rest, dotted ( $\text{♯}$ ) . . . . 219  
 quasi-quotation marks ( $\text{⌈} \square \text{⌋}$ ) *see* delimiters, upper corners  
 quaternions ( $\text{ℍ}$ ) *see* alphabets, math  
 queen ( $\text{♚}$ ) . . . . . 238–240, 361–363  
 question mark  
   ? . . . . . 37  
   ? . . . . . 311–312  
   ? . . . . . 22, 157  
   ? . . . . . 296  
   ? . . . . . 302  
   ? . . . . . 199  
   ? . . . . . 199  
   double (??) . . . . . 159  
   upside down (*¿*) . . . . 19  
 quidditch ( $\text{♣}$ ) . . . . . 240  
 quincunx ( $\text{⋈}$ ) . . . . . 168  
 Quine corners ( $\text{⌈} \square \text{⌋}$ ) . . . . *see* delimiters, upper corners  
 QuinScope ( $\text{Ⓚ}$ ) . . . . . 315–318  
 Quora ( $\text{Ⓚ}$ ) . . . . . 315–318  
 quotation marks 19, 21, 22, 34, 37, 284, 381, 384  
   decorative double left  
     “ . . . . . 22  
     ” . . . . . 199  
   decorative double left base  
     (“) . . . . . 199  
   decorative double left, inverted (“) . . . . . 284  
   decorative double right  
     ” . . . . . 22  
     ” . . . . . 199  
   decorative double right, inverted (”) . . . . . 284

decorative left (Ⓞ) . . . . 199  
 decorative right (Ⓟ) . . . 199  
 decorative single left base  
   (Ⓟ) . . . . . 199  
 double left (“) . . . . . 19  
 double right (”) . . . . . 19  
 double right base (,,) . . . 21, 384  
 single back (‘) . . . . . 37  
 single left (‘) . . . . . 19  
 single right (’) . . . . . 19  
 single right base (,) 21, 384  
 straight double (")<sup>+</sup> 21, 37, 381  
 straight double base (Ⓜ) 34  
 straight single (')<sup>+</sup> 34, 37, 381  
 straight single base (,) 34  
 straight triple ("" ) . . . . 37  
 Quran ( $\text{🕌}$ ) . . . . . 310








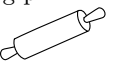


























































R






























R ( $\text{🇷🇺}$ ) . . . . . 270  
 r (*r*) . . . . . 163  
   fishhook (*r*) . . . . . 23  
 R Project ( $\text{Ⓜ}$ ) . . . . . 315–318  
 rabbit  
    . . . . . 264–267  
    . . . . . 264–267  
    . . . . . 262  
    . . . . . 262  
    . . . . . 268  
    . . . . . 268  
   rabbits ( $\text{🐰}$ ) . . . . . 264–267  
 raccoon  
    . . . . . 264–267  
    . . . . . 262  
 racing car  
    . . . . . 320  
    . . . . . 254  
 racing motorcycle ( $\text{🏍}$ ) . . . . 254  
 radar  
    . . . . . 328  
    . . . . . 328  
 radiation  
    . . . . . 284  
    . . . . . 270  
    . . . . . 176  
    . . . . . 311–312

































$\text{Ⓞ}$  . . . . . 328–329  
 $\text{Ⓟ}$  . . . . . 328–329  
 $\text{Ⓜ}$  . . . . . 296  
 radicals . . . . . *see* square root  
 radio  
    . . . . . 296  
    . . . . . 312  
 radio button  
    . . . . . 296  
    . . . . . 313  
 radix ( $\text{℞}$ ) . . . . . 168  
 railway car  
    . . . . . 320  
    . . . . . 254  
 railway track  
    . . . . . 320  
    . . . . . 254  
 rain  
    . . . . . 208–210  
    . . . . . 258  
 rainbow  
    . . . . . 323–325  
    . . . . . 296  
    . . . . . 312  
 raindrop . . . . . 361  
 raising hand ( $\text{🙋}$ )<sup>+</sup> 291, 295, 303  
 rake ( $\text{🍷}$ ) . . . . . 325–327  
 ram  
    . . . . . 200  
    . . . . . 343–346  
    . . . . . 206  
    . . . . . 262  
    . . . . . 268  
 ram’s horns ( $\text{♊}$ ) . . . . . 23  
 random ( $\text{🎲}$ ) . . . . . 173–175  
 Raspberry Pi ( $\text{🍷}$ )<sup>+</sup> . . . . 315–319  
 rat  
    . . . . . 343–346  
    . . . . . 262  
    . . . . . 268  
 ratio (:)<sup>+</sup> *see* colon, math mode  
 rational numbers ( $\text{ℚ}$ ) . . . . . *see* alphabets, math  
 Ravelry ( $\text{🧶}$ ) . . . . . 315–318  
 Raw Font Tables . . . . . 17, 162  
 rays  
   three above ( $\text{⤴}$ ) . . . . . 313  
   three below ( $\text{⤵}$ ) . . . . . 313  
   three left ( $\text{⤶}$ ) . . . . . 313  
   three right ( $\text{⤷}$ ) . . . . . 313


























- razor  ..... 325–327  
 ..... 296  
 React ()<sup>+</sup> ..... 315–319  
 ReactEurope () ..... 315–318  
 ReadMe () ..... 315–318  
 real  
 $\mathbb{R}$  ..... 119, 123  
 $\mathcal{R}$  ..... 124  
 real numbers ( $\mathbb{R}$ ) *see* alphabets, math  
 realhats (package) 138, 387, 388  
 Rebel () ..... 315–318  
 receipt  
 ..... 323–325  
 ..... 296  
 recipe ( $\mathbb{R}$ ) ..... 34, 366  
 record  
 ..... 255  
 ..... 255  
 ..... 296  
 record, vinyl () ..... 323–325  
 rectangle 195, 225–230, 333–334  
 ..... 54  
 ..... 38  
 ..... 38  
 ..... 47  
 ..... 47  
 ..... 193  
 ..... 47  
 ..... 61  
 ..... 194  
 filled  
 ..... 193  
 ..... 194  
 ..... 195  
 ..... 195  
 ..... 195  
 recycle (package) ..... 280, 387  
 recycling 279, 280, 284, 290–305, 311–312, 332  
<sup>+</sup> ..... 279, 284  
<sup>+</sup> ..... 279, 332  
<sup>+</sup> ..... 279, 280  
<sup>+</sup> ..... 296, 311–312  
 ..... 279  
 ..... 279  
 generic materials () ..... 279  
 type-1 plastics () ..... 279  
 type-2 plastics () ..... 279  
 type-3 plastics () ..... 279  
 type-4 plastics () ..... 279  
 type-5 plastics () ..... 279  
 type-6 plastics () ..... 279  
 type-7 plastics () ..... 279  
 Red Hat  
 ..... 315–318  
 ..... 318–319  
 Reddit  
 ..... 315–318  
 ..... 315–318  
 ..... 315–318  
 Redis () ..... 318–319  
 redo ()<sup>+</sup> ..... 173–175  
 reduced quadrupole moment ( $f$ ) ..... 370  
 reference ( $R$ ) ..... 177  
 reference mark ( $*$ ) ..... 34, 36  
`\reflectbox` ..... 368  
 refresh  
 ..... 171–172  
 ..... 171–172  
 refrigerator () ..... 286–287  
 registered trademark ( $\text{\textcircled{R}}$ )<sup>+</sup> .....  
 ..... *see* legal symbols,  
 registered trademark  
 relation  
 left project () ..... 149  
 lifting () ..... 149  
 right project () ..... 149  
 relational algebra ..... *see* join  
 (database)  
 relational symbols ..... 67, 81  
 binary 68–71, 73–74, 76–91,  
 115–117  
 negated binary ... 68–70,  
 72–76, 78  
 triangle ..... 91–93  
 religious symbols 186, 187, 257,  
 310, 333  
 relsize (package) ..... 30  
 reminder ribbon  
 ..... 297  
 ..... 313  
 remove formatting () 173–175  
 Renren () ..... 315–318  
 repeat () ..... 297  
 repeat single () ..... 297  
 replace  
 all (left) ( $\leftarrow$ ) ..... 113  
 all (left/right) ( $\leftrightarrow$ ) .. 113  
 all (right) ( $\rightarrow$ ) ..... 113  
 all bound variables (left)  
 ( $\leftarrow$ ) ..... 113  
 all bound variables  
 (left/right) ( $\leftrightarrow$ ) ... 113  
 all bound variables (right)  
 ( $\rightarrow$ ) ..... 113  
 any (left) ( $\leftarrow$ ) ..... 113  
 any (left/right) ( $\leftrightarrow$ ) .. 113  
 any (right) ( $\rightarrow$ ) ..... 113  
 any free variables (left) ( $\leftarrow$ )  
 ..... 113  
 any free variables (left/right)  
 ( $\leftrightarrow$ ) ..... 113  
 any free variables (right)  
 ( $\rightarrow$ ) ..... 113  
 equivalent expressions (left)  
 ( $\leftarrow$ ) ..... 114  
 equivalent expressions  
 (left/right) ( $\leftrightarrow$ ) ... 114  
 equivalent expressions  
 (right) ( $\rightarrow$ ) ..... 114  
 reply () ..... 173–175  
 reply all () ..... 173–175  
 Replyd () ..... 315–318  
 Republican () ..... 328–329  
 request () ..... 281  
 rescue worker’s helmet () . 297  
 ResearcherID  
 ..... 330–331  
 ..... 330–331  
 ResearchGate  
 ..... 330–331  
 $\mathbb{R}^e$  ..... 330–331  
 ..... 315–318  
 resistivity ( $\ll$ ) ..... 177  
`\resizebox` ..... 148, 366  
 resmes (package) . 44, 387, 388  
 Resolving () ..... 315–318  
 respondens ( $\sim$ )<sup>+</sup> ..... 271  
 response ( $\mathbb{R}$ ) ..... 385, 386  
`\restoresymbol` ..... 364  
 restriction ( $\upharpoonright$ )<sup>+</sup> 95, 99, 100, 104,  
 105, 110, 115, 160  
 barb ( $\downarrow$ )<sup>+</sup> ..... 115  
 mallet ( $\downarrow$ )<sup>+</sup> ..... 115  
 negated ( $\dagger$ )<sup>+</sup> ... 100, 105  
 wand ( $\downarrow$ )<sup>+</sup> ..... 115  
 restriction of a measure ... 44  
 restroom  
 ..... 257  
 ..... 257  
 ..... 328–329  
 ..... 292  
 ..... 304  
 ..... 297  
 ..... 254  
 ..... 254  
 ..... 254  
 ..... 254

- ‡ . . . . . 254
- retort (⚔) . . . . . 275
- retrograde (℞) . . . . . 168
- return . . . . . *see* carriage return
- retweet (↪) . . . . . 173–175
- Rev (Ⓒ) . . . . . 315–318
- reverse solidus (\)+ . . . . . *see* backslash
- reversed letters
  - D (Ⓓ) . . . . . 25
  - e (e)+ . . . . . 23, 24
  - L, sans serif (Ⓕ) . . . . . 159
  - l, small caps (Ⓛ) . . . . . 24
  - r, small caps (Ⓡ) . . . . . 24
- reversed symbols . . . . . 368
- rewind . . . . . *see* media control symbols, reverse
- rhinoceros (🦏) . . . . . 262
- rho
  - lowercase ( $\rho$ )+ 20, 120–122
  - lowercase variant ( $\varrho$ )+ 120–122
  - uppercase (P)+ . . . . . 20, 120
- rhombus ( $\diamond$ )+ 37, 39–40, 45–52, 95, 157, 158, 192–198, 225–230, 233, 234, 253, 255, 270, 333–334, 358–359
  - blue ( $\color{blue}\diamond$ )+ . . . . . 298, 303
  - circle ( $\circ$ ) . . . . . 47
  - concave ( $\nabla$ ) . . . . . 48
  - concave, with tick ( $\nabla$ )+ 47
  - concentric ( $\circ$ ) . . . . . 255
  - crossed ( $\boxtimes$ ) . . . . . 197
  - curved ( $\curvearrowright$ )+ . . . . . 48, 50, 193, 253
  - curved, crossed ( $\boxtimes$ ) . . . . . 50
  - curved, dotted ( $\diamond$ ) . . . . . 50
  - curved, filled ( $\blacklozenge$ )+ . . . . . 48, 52
  - curved, horizontally divided ( $\diamond$ )+ . . . . . 51
  - curved, outlined ( $\diamond$ )+ 48, 49
  - curved, quartered
    - $\boxplus$  . . . . . 49
    - $\diamond$  . . . . . 49
    - $\diamond$  . . . . . 50
  - curved, slashed ( $\diamond$ )+ 49, 51
  - curved, small rhombus, filled ( $\diamond$ ) . . . . . 50
  - curved, vertically divided ( $\diamond$ )+ . . . . . 50
  - dotted ( $\diamond$ )+ . . . . . 45, 46, 50, 158, 192, 194, 197
  - dotted multiply ( $\diamond$ ) . . . . . 312
  - dotted, with arrow
    - $\diamondrightarrow$ + . . . . . 95
    - $\diamondleftrightarrow$ + . . . . . 95
  - enclosing ( $\diamond$ ) . . . . . 193
  - error bars ( $\diamond$ ) . . . . . 193
  - error bars, filled ( $\blacklozenge$ ) . . . . . 193
  - filled ( $\blacklozenge$ )+ . . . . . 39, 45–49, 52, 158, 192–195, 197
  - filled, shadowed ( $\blacklozenge$ )+ . . . . . 194
  - half filled
    - $\blacklozenge$ + . . . . . 194, 196
    - $\blacklozenge$ + . . . . . 194–196
    - $\blacklozenge$ + . . . . . 194, 196
    - $\blacklozenge$ + . . . . . 194–196
  - horizontally divided ( $\diamond$ )+ . . . . . 45–47, 51, 192, 196
  - of blue rhombuses, with dot ( $\color{blue}\diamond$ ) . . . . . 297
  - of dots ( $\therefore$ )+ . . . . . 40, 152
  - of filled rhombuses ( $\blacklozenge$ )+ . . . . . 198, 199, 270
  - of rhombuses ( $\boxplus$ ) . . . . . 270
  - orange ( $\color{orange}\diamond$ )+ . . . . . 298, 303
  - outlined ( $\diamond$ ) . . . . . 48
  - patterned
    - $\blacklozenge$  . . . . . 196
    - $\blacklozenge$  . . . . . 196
  - quartered
    - $\diamond$ + . . . . . 45–47, 50
    - $\diamond$ + . . . . . 45–47, 49, 196
  - rhombus ( $\diamond$ )+ . . . . . 45, 46
  - shadowed
    - $\diamond$  . . . . . 195
    - $\diamond$  . . . . . 195
    - $\diamond$  . . . . . 195
  - slashed ( $\diamond$ )+ 45, 46, 49, 51
  - small rhombus, filled ( $\diamond$ )+ . . . . . 50, 193
  - striped ( $\blacklozenge$ )+ . . . . . 196
  - triangle ( $\diamond$ ) . . . . . 47
  - vertically divided ( $\diamond$ )+ 45–47, 50, 196
  - white on black ( $\blacklozenge$ ) . . . . . 253
  - with arrow
    - $\diamondrightarrow$ + . . . . . 95
    - $\diamondleftrightarrow$ + . . . . . 95
- ribbon
  - $\blacklozenge$  . . . . . 323–325
  - $\blacklozenge$  . . . . . 297
  - $\blacklozenge$  . . . . . 312
- rice ball
  - $\blacklozenge$  . . . . . 285
  - $\blacklozenge$  . . . . . 312
- rice bowl
  - $\blacklozenge$  . . . . . 285
  - $\blacklozenge$  . . . . . 287
- rice cracker
  - $\blacklozenge$  . . . . . 285
  - $\blacklozenge$  . . . . . 312
- rice sheaf
  - $\blacklozenge$  . . . . . 298
  - $\blacklozenge$  . . . . . 281
- right angles . . . . . 156, 160
- rinforzando
  - $\text{rfz}$  . . . . . 219
  - $\text{rf}$  . . . . . 219
- ring
  - $\blacklozenge$  . . . . . 323–325
  - $\blacklozenge$  . . . . . 297
  - $\blacklozenge$  . . . . . 290
- ring accent ( $\textcircled{\text{a}}$ )+ . . . . . *see* accents, ring
- ring equals ( $\textcircled{=}$ ) . . . . . *see* equal, ring
- ring sum ( $\textcircled{+}$ ) . . . . . *see* circled symbols, plus
- ring within equals ( $\textcircled{=}$ ) . . . . . *see* equal, ring
- ringed planet ( $\textcircled{\text{a}}$ ) . . . . . 297
- RIP ( $\textcircled{\text{a}}$ ) . . . . . 270
- river ( $\textcircled{\text{a}}$ ) . . . . . 315–318
- \rlap . . . . . 31, 195, 371, 372
- road ( $\textcircled{\text{a}}$ ) . . . . . 323–325
- roasted sweet potato
  - $\blacklozenge$  . . . . . 285
  - $\blacklozenge$  . . . . . 287
- robe ( $\textcircled{\text{a}}$ ) . . . . . 325–327
- robot
  - $\blacklozenge$  . . . . . 323–325
  - $\blacklozenge$  . . . . . 297
- rock ( $\textcircled{\text{a}}$ ) . . . . . 297
- Rock RMS ( $\textcircled{\text{a}}$ ) . . . . . 315–318
- rock, paper, scissors (also lizard, Spock) . . . . . *see* hand
- rocket
  - $\blacklozenge$  . . . . . 323–325
  - $\blacklozenge$  . . . . . 279
  - $\blacklozenge$  . . . . . 279
  - $\blacklozenge$  . . . . . 279
  - $\blacklozenge$  . . . . . 279
  - $\blacklozenge$  . . . . . 279
  - $\blacklozenge$  . . . . . 320
  - $\blacklozenge$  . . . . . 254
- Rocket.Chat ( $\textcircled{\text{a}}$ ) . . . . . 315–318

- rockets . . . . . 254
  - rod of Asclepius
    -  . . . . . 275
    -  . . . . . 291
  - rojud (package) . . . 245, 246, 387, 388
  - roll of paper () . . . . . 297
  - roller coaster
    -  . . . . . 297
    -  . . . . . 313
  - roller skate () . . . . . 320
  - rolling on the floor laughing () . . . . . 297
  - rolling pin
    -  . . . . . 286–287
    -  . . . . . 288
  - Roman coins . . . . . 32
  - Romania () . . . . . 243
  - Romanian counties . . . 245–246
  - rooster
    -  . . . . . 343–346
    -  . . . . . 262
    -  . . . . . 268
  - roots . . . . . *see* square root
  - ROR
    -  . . . . . 330–331
    -  . . . . . 330–331
  - rose
    -  . . . . . 297
    -  . . . . . 281
  - rosette
    -  . . . . . 200
    -  . . . . . 297
    -  . . . . . 281
  - roshambo . . . . . *see* hand, 186
  - `\rotatebox` . . . . . 30, 368, 372
  - rotated letters . . . . . 22–25, 125
    - a
      - $\text{a}^+$  . . . . . 23, 25
      - $\text{a}^+$  . . . . . 23, 24
    - e ( $\text{a}^+$ ) . . . . . *see* schwa
    - f ( $\text{j}^+$ ) . . . . . 24
    - h ( $\text{u}^+$ ) . . . . . 23, 24
    - k ( $\text{x}^+$ ) . . . . . 23
    - k, small caps ( $\text{x}^+$ ) . . . . . 24
    - L, sans serif ( $\text{r}^+$ ) . . . . . 159
    - m ( $\text{u}^+$ ) . . . . . 23–25
    - r ( $\text{i}^+$ ) . . . . . 23–25
    - r, with tail ( $\text{r}^+$ ) . . . . . 23, 24
    - s, inverted ( $\text{a}^+$ ) . . . . . 42, 76
    - t ( $\text{r}^+$ ) . . . . . 23
    - u, small caps ( $\text{a}^+$ ) . . . . . 24
    - v ( $\text{a}^+$ ) . . . . . 23, 25
    - w ( $\text{m}^+$ ) . . . . . 23, 25
    - y ( $\text{a}^+$ ) . . . . . 23, 25
  - rotated symbols . . . . . 30, 368
  - rotating (package) . . . . . 34, 169
  - rotations
    - dice . . . . . 360
    - Rubik’s Cube . . . . . 329
  - route () . . . . . 173–175
  - rowing
    -  . . . . . 320, 321
    -  . . . . . 254
  - rsfs (package) . . . . . 162, 387
  - RSS
    -  . . . . . 173–175
    -  . . . . . 173–175
    -  . . . . . 171–172
    -  . . . . . 171–172
  - rubbish bin . . . . . *see* trash
  - Rubik’s Cube . . . . . 329
  - rubikcube (package) . . . 329, 387, 388
  - ruble () . . . . . 32
  - Ruby () . . . . . 318–319
  - Ruby on Rails
    -  . . . . . 318–319
    -  . . . . . 318–319
  - rugby football
    -  . . . . . 297
    -  . . . . . 241
  - rule delayed ( $\text{:=}$ ) . . . . . 77
  - ruler
    -  . . . . . 323–325
    -  . . . . . 299
    -  . . . . . 313
    - triangular
      -  . . . . . 301
      -  . . . . . 313
  - runes . . . . . 15, 211
    - Anglo-Frisian . . . . . 211
    - Danish . . . . . *see* normal runes
    - Germanic . . . . . 211
    - Hälsinge . . . . . *see* staveless runes
    - long-branch . . . . . *see* normal runes
    - medieval . . . . . 211
    - normal . . . . . 211
    - short-twig . . . . . 211
    - staveless . . . . . 211
    - Swedo-Norwegian . . . . . *see* short-twig runes
  - running () . . . . . 241, 291, 295, 303, 328–329
  - running shirt () . . . . . 297
  - running shirt with sash () . . . . . 313
  - rupee
    - $\text{₹}$  . . . . . 32
  - $\text{₹}$  . . . . . 32
  - Rust () . . . . . 315–319
- ## S
- S () . . . . . 270
  - s
    - lazy ( $\text{a}^+$ ) . . . . . *see* rotated letters, s, inverted
    - long ( $\text{f}^+$ ) . . . . . 35, 367
  - sacrifice () . . . . . 208–210
  - sacsymb (package) . . . . . 329, 387, 388
  - Safari () . . . . . 315–318
  - safety pin () . . . . . 297
  - safety vest () . . . . . 297
  - safety-related symbols . . . . . 176
  - Sagittarius ( $\text{x}^+$ ) . . . . . 166–168, 297, 335–338
  - salad () . . . . . 285
  - Salesforce () . . . . . 315–318
  - salt () . . . . . 285
  - saltire ( $\text{x}$ ) . . . . . 188
  - sampi
    - lowercase ( $\text{a}^+$ ) . . . . . 208
    - lowercase variant ( $\text{f}^+$ ) . . . . . 208
    - uppercase ( $\text{a}^+$ ) . . . . . 208
  - sandwich () . . . . . 285
  - Santa Claus
    -  . . . . . 297
    -  . . . . . 312
  - Santa Claus’s hat, as math-mode accent () . . . . . 138
  - Sappho () . . . . . 168
  - sarabian (package) . . . . . 207, 387, 388
  - sari () . . . . . 297
  - Sass () . . . . . 315–319
  - satellite () . . . . . 323–325
  - satellite dish
    -  . . . . . 323–325
    -  . . . . . 318–319
    -  . . . . . 198
    -  . . . . . 297
    -  . . . . . 314
  - satisfies ( $\text{=}$ ) . . . . . *see* turnstile, double dash, right
  - Saturn ( $\text{h}^+$ ) . . . . . 166–168, 279, 335–338
  - save
    -  . . . . . 173–175
    -  . . . . . 173–175
  - savesym (package) . . . . . 364
  - `\savesymbol` . . . . . 364
  - saw
    -  . . . . . 208–210

 ..... 200  
saxophone  
 ..... 297  
 ..... 313  
Scala ()<sup>+</sup> ..... 318–319  
scale  
 ..... 275  
 ..... 328–329  
 ..... 328–329  
 ..... 328–329  
 ..... 328–329  
\scalebox ..... 366  
scalrel (package) ..... 372  
scaling  
mechanical ..... 376, 378  
optical ..... 376  
scallions () 286–287  
scarf () ..... 297  
Schlix () ..... 315–318  
school  
 ..... 323–325  
 ..... 297  
 ..... 314  
schoolbag  
 ..... 325–327  
 ..... 313  
schwa (ə)<sup>+</sup> ..... 22, 24, 25  
hooked (ə) ..... 23  
Schwartz distribution spaces *see* alphabets, math  
scientific symbols ..... 164–178, 358–359  
scientist ()<sup>+</sup> ..... 291, 297, 303  
SciHub  
 ..... 330–331  
 ..... 330–331  
SciRate  
 ..... 330–331  
 ..... 330–331  
scissors ..... 182, 183, 186  
 ..... 182  
 ..... 182  
 ..... 182  
 ..... 182  
 ..... 182  
 ..... 182  
 ..... 182

 ..... 182  
 ..... 182  
 ..... 182  
 ..... 173–175  
 ..... 322  
 ..... 297  
 ..... 183  
 ..... 183  
 ..... 183  
 ..... 183  
scooter  
 ..... 325–327  
 ..... 254  
scooters ..... 254  
Scopus  
 ..... 330–331  
 ..... 330–331  
Scorpio (♏)<sup>+</sup> .. 166–168, 297, 335–338  
scorpion  
 ..... 208–210  
 ..... 264–267  
 ..... 262  
Scottish hat, as math-mode accent () ..... 138  
screen () ..... 312  
screwdriver  
 ..... 323–325  
 ..... 298  
Scribd () ..... 315–318  
script letters *see* alphabets, math  
\scriptscriptstyle ..... 371  
\scriptstyle ..... 371  
scroll  
 ..... 323–325  
 ..... 298  
 ..... 314  
scsnowman (package) . 309, 387, 388  
SD card () ..... 323–325  
seahorse () ..... 264–267  
seal () ..... 262  
search () ..... 173–175  
with dollar sign () . 173–175  
with location () 173–175  
with minus sign () . 173–175

with plus sign () 173–175  
Searchengin () ..... 315–318  
seashell  
 ..... 262  
 ..... 268  
seat  
 ..... 298  
 ..... 313  
seconds, angular *see* prime, double  
section mark (§)<sup>+</sup> .. 19, 35, 36, 159, 170, 383  
sector (∠) ..... 159  
sedenions (\$) *see* alphabets, math  
seedling  
 ..... 323–325  
 ..... 298  
 ..... 281  
seeds () ..... 325–327  
Segletes, Steven B. .... 372  
segment (∩) ..... 160  
segmented numerals ..... 164  
segno  
 ..... 214  
 ..... 214  
 ..... 214  
 ..... 216  
selfie () ..... 298  
SellCast () ..... 315–318  
Sellsy () ..... 315–318  
semaf.fd (file) ..... 357  
Semantic Scholar  
 ..... 330–331  
 ..... 330–331  
semantic valuation ... 128, 133  
semaphor (package) .. 355, 357, 387  
semaphore symbols .. 355–357  
semicircle  
 ..... 193  
 ..... 193  
notched with three dots  
 ..... 310  
 ..... 310  
plus  
 ..... 42  
 ..... 42  
semicolon (;) ..... 37  
hollow (§)<sup>+</sup> 38, 41, 42, 160  
semidirect product  
left (⋈)<sup>+</sup> .. 38, 40–42, 158

right ( $\curvearrowright$ )<sup>+</sup> . 38, 39, 41–43, 158

semidirect products 38, 39, 158

semisextile ( $\mathfrak{V}$ ) . . . . . 168

semisquare ( $\mathfrak{L}$ ) . . . . . 168

semitic transliteration . . 25, 30

semtrans (package) . 25, 30, 387, 388

separated ( $\langle \rangle$ ) . . . . . 70

separation vector ( $\mathfrak{s}$ ) . . . . . 163

sequent ( $\succ$ ) . . . . . 81

denied ( $\mathfrak{V}$ ) . . . . . 81

Serbia ( $\mathfrak{S}$ ) . . . . . 243

serial interface ( $\mathfrak{S}$ ) . . . . . 169

serial port ( $\mathfrak{S}$ ) . . . . . 169

server ( $\mathfrak{S}$ ) . . . . . 173–175

service dog ( $\mathfrak{S}$ ) . . . . . 262

service mark ( $\mathfrak{SM}$ ) . . . . . *see* legal symbols, service mark

ServiceStack ( $\mathfrak{S}$ ) . . . . . 315–318

sesquiquadrate ( $\mathfrak{S}$ ) . . . . . 168

set ( $\mathfrak{S}$ ) . . . . . 208–210

set difference ( $\setminus$ )<sup>+</sup> 37, 38, 40, 41, 43

set interior ( $\mathfrak{S}$ )<sup>+</sup> *see* accents, ring

set intersection ( $\cap$ )<sup>+</sup> . . . . . *see* intersection

set membership ( $\in$ )<sup>+</sup> 73, 77, 82, 123–125

bar over ( $\bar{\in}$ )<sup>+</sup> . . . . . 77, 123

bar over, negated ( $\bar{\notin}$ ) . 78

bar under ( $\underline{\in}$ ) . . . . . 77

dot ( $\dot{\in}$ ) . . . . . 77

equal ( $\equiv$ ) . . . . . 77

extended horizontal line ( $\epsilon$ )<sup>+</sup> . . . . . 76, 77

negated ( $\notin$ )<sup>+</sup> . . 74, 75, 78, 82, 123–125

plus ( $\in$ )<sup>+</sup> . . . . . 68, 76

reversed ( $\ni$ )<sup>+</sup> . . 73, 74, 77, 78, 82, 123–125, 370

reversed, bar over ( $\bar{\ni}$ )<sup>+</sup> 77, 78

reversed, bar under ( $\underline{\ni}$ ) 123

reversed, extended horizontal line ( $\ni$ )<sup>+</sup> . . . . . 76, 77

reversed, negated ( $\nexists$ )<sup>+</sup> 75, 78, 82, 123–125

reversed, negated, bar over ( $\bar{\nexists}$ ) . . . . . 78

reversed, plus ( $\ni$ )<sup>+</sup> . 68, 76

reversed, short vertical bar ( $\ni$ )<sup>+</sup> . . . . . 76–78

short vertical bar ( $\epsilon$ )<sup>+</sup> 76, 77

set symmetric difference ( $\Delta$ ) *see* triangle

set union ( $\cup$ )<sup>+</sup> . . . . . *see* union


sewing needle ( $\mathfrak{S}$ ) . . . . . 298


sextile ( $\mathfrak{X}$ ) . . . . . 168


SGML . . . . . 384


sha (III)<sup>+</sup> . . . . . 367–368


shake


 . . . . . 214

 . . . . . 214

 . . . . . 214

 . . . . . 214


 . . . . . 214


 . . . . . 214


shamrock ( $\mathfrak{S}$ ) . . . . . 298


shapes ( $\mathfrak{S}$ ) . . . . . 173–175


share

 . . . . . 173–175


 . . . . . 173–175


 . . . . . 173–175

 . . . . . 173–175

 . . . . . 173–175

shark

 . . . . . 264–267

 . . . . . 262

sharp ( $\sharp$ )<sup>+</sup> . . 212, 213, 216, 219

double ( $\mathfrak{S}$ )<sup>+</sup> . . . . . 216, 219

with extra slashes and stems

$\#\#$  . . . . . 219

$\#\#$  . . . . . 219

$\#\#$  . . . . . 219

$\#\#$  . . . . . 219


sharp s


lowercase ( $\mathfrak{S}$ ) . . . . . 20

uppercase (SS) . . . . . 20

Sharpe, Michael . . . . . 30


shaved ice


 . . . . . 285


 . . . . . 287


shears ( $\mathfrak{S}$ ) . . . . . 325–327


sheep


 . . . . . 264–267


 . . . . . 264–267

 . . . . . 264–267

 . . . . . 264–267

 . . . . . 206


 . . . . . 262


 . . . . . 268

Sheffer's stroke ( $\uparrow$ )<sup>+</sup> *see* vertical bar

shekel ( $\mathfrak{S}$ ) . . . . . 32


shell script


 . . . . . 329


 . . . . . 329

shell, operating system ( $\mathfrak{S}$ ) 329

shield


 . . . . . 200


 . . . . . 298


 . . . . . 254


shinto shrine ( $\mathfrak{S}$ ) . . . . . 298


ship . . . . . 254, 320


 . . . . . 320


 . . . . . 323–325

 . . . . . 325–327

 . . . . . 321

 . . . . . 320


 . . . . . 254


 . . . . . 254


shipping fast ( $\mathfrak{S}$ ) . . . 328–329


Shirts in Bulk ( $\mathfrak{S}$ ) . . . 315–318


shoe


 . . . . . 325–327


 . . . . . 343–346


 . . . . . 291


 . . . . . 297


 . . . . . 301


 . . . . . 304


 . . . . . 299

 . . . . . 293

 . . . . . 300


 . . . . . 281


 . . . . . 281

 . . . . . 281


Shopify ( $\mathfrak{S}$ ) . . . . . 315–318


shopping bag

 . . . . . 323–325

 . . . . . 322


shopping bags


 . . . . . 298


 . . . . . 254


shopping basket ( $\mathfrak{S}$ ) . 323–325

shopping cart

 . . . . . 323–325

 . . . . . 322

 . . . . . 298

 . . . . . 254

Shopware (☺) . . . . . 315–318  
 short-twig runes . . . . . 211  
 shortcake  
     🍰 . . . . . 285  
     🍰 . . . . . 287  
 shorts (👖) . . . . . 298  
 shovel (🔨) . . . . . 275  
 show  
     👁️ . . . . . 173–175  
     👁️ . . . . . 173–175  
 shower  
     🚿 . . . . . 323–325  
     🚿 . . . . . 325–327  
     🚿 . . . . . 259  
     🚿 . . . . . 298  
     🚿 . . . . . 254  
 shrimp  
     🍤 . . . . . 286–287  
     🍤 . . . . . 262  
 shrugging (🙄)<sup>+</sup> . . . 291, 295, 303  
 shuffle (package) . . . 44, 387, 388  
 shuffle product (⊔)<sup>+</sup> . . . 43, 44  
     complete (⊞) . . . . . 44  
 shuffle tracks (🔄) . . . . . 298  
 shuttle van (🚌) . . . . . 323–325  
 sieve (🪦) . . . . . 288  
 sigma  
     lowercase (σ)<sup>+</sup> . . . 20, 24, 120,  
         121  
     lowercase variant (ς)<sup>+</sup> . . . 120–  
         122  
     uppercase (Σ)<sup>+</sup> . . . . . 20, 120,  
         121  
 sign (📧) . . . . . 323–325  
 sign in (➡️) . . . . . 173–175  
 sign language . . . . . 272–275, 320  
     👦 . . . . . 320  
     👦 . . . . . 320  
 sign out (👈) . . . . . 173–175  
 signal  
     📶 . . . . . 173–175  
     📶 . . . . . 292  
     📶 . . . . . 312  
 signature (✍️) . . . . . 173–175  
 signs . . . . . 271  
 silly walks . . . . . 308  
 sillypage (package) . . . 308, 387, 388  
 sim card (📱) . . . . . 323–325  
 similar (≈)<sup>+</sup> . . . . . 67, 70, 73, 77, 369,  
     372, 382  
     colon (≈:) . . . . . 81  
     colon, double (≈::) . . . . . 81

dots, rising (≈)<sup>+</sup> . . . 76, 77  
 dots, vertical (≈)<sup>+</sup> . . . 76, 77  
 dotted (≈)<sup>+</sup> . . . . . 76, 78  
 minus, similar (≈) . . . . . 77  
 negated (≠)<sup>+</sup> . . . . . 68, 70, 72, 74,  
     76, 78  
 or equal to  
     ≈<sup>+</sup> . . . . . 67, 70, 73, 76, 77  
     ≈<sup>+</sup> . . . . . 67, 70, 73, 77, 91  
 or equal to, dotted (≐)<sup>+</sup> . . . 73,  
     77  
 or equal to, dotted, negated  
     (≐) . . . . . 78  
 or equal to, negated  
     ≠<sup>+</sup> . . . . . 68, 70, 72, 75, 76, 78  
     ≠<sup>+</sup> . . . . . 69, 70, 72, 74, 75, 78,  
     91  
 or equal to, reversed  
     ⊆<sup>+</sup> . . . . . 68, 70, 73, 76, 77  
     ⊆<sup>+</sup> . . . . . 70, 73, 77  
 or equal to, reversed,  
 negated  
     ≠<sup>+</sup> . . . . . 69, 72, 74  
     ≠<sup>+</sup> . . . . . 72, 74  
 or greater than (≧) . . . . . 90  
 or greater than or equal to  
     (≧) . . . . . 90  
 or less than (≦) . . . . . 90  
 or less than or equal to (≦)  
     . . . . . 90  
 or not equal to (≠)<sup>+</sup> . . . 75, 77  
 or not equal to, reversed (≠)  
     . . . . . 74  
 reversed (≈)<sup>+</sup> . . . . . 68, 70, 73,  
     76, 77  
 reversed, negated (≠)<sup>+</sup> . . . 69,  
     72, 74  
 thick (≈)<sup>+</sup> . . . . . 68, 73, 76, 77  
 simplewick (package) . . . . . 375  
 SimplyBuilt (🏠) . . . . . 315–318  
 simpsons (package) . . . . . 306, 387  
 Simpsons characters . . . . . 306  
 since (:)<sup>+</sup> . . . . . *see* therefore, down  
 sine wave  
     ~ . . . . . 159  
     ~ . . . . . 159  
 sing (🎤) . . . . . 208–210  
 singer (🎤)<sup>+</sup> . . . . . 291, 298, 303  
 sink (🚰) . . . . . 323–325  
 SISTRIX (📊) . . . . . 315–318  
 Sitefinity (🔗) . . . . . 318–319  
 sitemap (🗺️) . . . . . 173–175  
 Sith (👹) . . . . . 315–318  
 sixteenth note (🎵)<sup>+</sup> . . . 215–218




























dotted (🎵)<sup>+</sup> . . . . . 216–218  
 double dotted (🎵)<sup>+</sup> . . . . . 217,  
     218  
     rest (🎵)<sup>+</sup> . . . . . 214, 215, 219  
     rest, dotted (🎵) . . . . . 219  
 sixty-fourth note (🎵) . . . . . 216  
     dotted (🎵) . . . . . 216  
     rest (🎵) . . . . . 214  
 skak (package) . . . . . 239, 387, 388  
 skateboard (🛹) . . . . . 321  
 skating (🛷) . . . . . 240  
 Sketch (📎) . . . . . 315–318  
 skiing  
     🏂 . . . . . 240  
     🏂 . . . . . 240  
     🏂 . . . . . 298  
 skillet (🍳) . . . . . 286–287  
 skin (🐼) . . . . . 208–210  
 skis (🎿) . . . . . 298  
 skull (package) . . . . . 270, 387, 388  
 skull . . . . . 52, 270, 284, 290–305,  
     312–314, 361  
     👤 . . . . . 52  
     👤 . . . . . 52  
     👤 . . . . . 328–329  
     👤 . . . . . 298  
     👤 . . . . . 307  
 and crossbones  
     👤 . . . . . 270  
     👤 . . . . . 284  
     👤 . . . . . 298  
     👤 . . . . . 314  
     👤 . . . . . 328–329  
 skunk (🦨) . . . . . 262  
 sky (🌤️) . . . . . 208–210  
     sky animal (🐼) . . . . . 208–210  
     sky pillar (🏢) . . . . . 208–210  
 SkyAtlas (🌐) . . . . . 315–318  
 Skype  
     📞 . . . . . 315–318  
     📞 . . . . . 314  
     📞 . . . . . 314  
 Slack  
     # . . . . . 315–318  
     # . . . . . 315–318  
 slash (/)<sup>+</sup> . . . . . 37, 40, 41, 46, 61, 70,  
     77, 127, 129–132, 370, 382  
     bar over (7) . . . . . 43




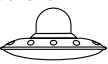








































double (//)<sup>+</sup> . . . 38, 41, 42  
 fraction (/)<sup>+</sup> . . . . . 42, 160  
 hollow (//)<sup>+</sup> . . . . . 38, 76  
 horizontally centered . 370  
 negated (÷) . . . . . 168  
 triple (///) . . . . . 42  
**slashed** (package) . . . . . 370  
**slashed letters** . . . . . 370  
 b (ß) . . . . . 24  
 c (ç) . . . . . 24  
 d (đ) . . . . . 24  
 O (Ø) . . . . . 20  
 o (ø) . . . . . 20  
 u (ŷ) . . . . . 24  
**slashed.sty** (file) . . . . . 370  
 sled (🚠) . . . . . 321  
 sleeping (ZZZ) . . . . . 313  
 sleeping accommodation (🛏) . .  
 . . . . . 254  
 sleeping bag (🛖) . . . . . 325–327  
 sleet (🌨) . . . . . 258  
 sleigh (🛷) . . . . . 323–325  
 slice (<)<sup>+</sup> . . . 38, 41, 42, 45, 70  
 sliders (🍷) . . . . . 173–175  
 SlideShare (📺) . . . . . 315–318  
 sling (🎒) . . . . . 200  
 slot machine  
 🎰 . . . . . 298  
 🎲 . . . . . 241  
 sloth (🦥) . . . . . 262  
 Slovakia (☞) . . . . . 243  
 Slovenia (☞) . . . . . 243  
 small caps letters  
 a (A) . . . . . 22  
 b (B) . . . . . 22  
 d (D) . . . . . 25  
 e (E) . . . . . 22  
 f (F) . . . . . 23  
 g (G)<sup>+</sup> . . . . . 22, 25  
 h (H) . . . . . 22  
 i (I)<sup>+</sup> . . . . . 22, 24  
 j (J) . . . . . 22  
 k (K) . . . . . 23  
 l (L) . . . . . 22  
 m (M) . . . . . 23  
 n (N)<sup>+</sup> . . . . . 22, 24  
 p (P) . . . . . 23  
 q (Q) . . . . . 23  
 r (R)<sup>+</sup> . . . . . 22, 24  
 u (U)<sup>+</sup> . . . . . 22, 24  
 y (Y)<sup>+</sup> . . . . . 22, 24  
 smaller than (≦) see less than,  
 horizontally barred






































smash product (※)<sup>+</sup> . . . 41, 43  
 smiles and frowns 67, 68, 73–78,  
 116, 117  
 ^<sup>+</sup> 67, 68, 73, 74, 76, 77,  
 81, 116, 117, 161  
 ~<sup>+</sup> 67, 68, 73, 74, 76, 77,  
 81, 116, 117, 161  
 both  
 x<sup>+</sup> 73, 81, 116, 117, 161  
 o<sup>+</sup> 73, 81, 116, 117, 161  
 both, equals  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116  
 both, equals, negated  
 ≠ . . . . . 116  
 ≠ . . . . . 116  
 ≠<sup>+</sup> . . . . . 116  
 ≠<sup>+</sup> . . . . . 116  
 both, negated  
 ≠<sup>+</sup> . . . . . 74, 116, 117  
 ≠<sup>+</sup> . . . . . 75, 116, 117  
 double  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116  
 double, equals  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116  
 double, equals, negated  
 ≠<sup>+</sup> . . . . . 116  
 ≠<sup>+</sup> . . . . . 116  
 double, negated  
 ≠<sup>+</sup> . . . . . 116  
 ≠<sup>+</sup> . . . . . 116  
 equals  
 ≡ . . . . . 73, 117  
 ≡ . . . . . 73, 117  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116  
 equals, negated  
 ≠ . . . . . 74, 117  
 ≠ . . . . . 75, 117  
 ≠<sup>+</sup> . . . . . 116  
 ≠<sup>+</sup> . . . . . 116  
 ≠<sup>+</sup> . . . . . 116  
 ≠<sup>+</sup> . . . . . 116  
 negated  
 ≠<sup>+</sup> . . . . . 74, 116, 117  
 ≠<sup>+</sup> . . . . . 75, 116, 117  
 triple  
 ≡<sup>+</sup> . . . . . 116  
 ≡<sup>+</sup> . . . . . 116






































triple, negated  
 ≠<sup>+</sup> . . . . . 116  
 ≠<sup>+</sup> . . . . . 116  
 smiley faces . . . . 159–160, 170,  
 253, 257, 278, 284, 288–306,  
 311–312, 334–338  
 smog (☁️) . . . . . 259  
 smoking . . . . . 254  
 🚬 . . . . . 323–325  
 🚭 . . . . . 254  
 SMS (📱) . . . . . 173–175  
 snail  
 🐌 . . . . . 264–267  
 🐌 . . . . . 264–267  
 🐌 . . . . . 264–267  
 🐌 . . . . . 262  
 🐌 . . . . . 268  
 snake . . . . . 339–340  
 🐍 . . . . . 208–210  
 ~ . . . . . 201  
 ~ . . . . . 262  
 ~ . . . . . 268  
 Snapchat  
 📷 . . . . . 315–318  
 📷 . . . . . 315–318  
 📷 . . . . . 315–318  
 snow plow (🚚) . . . . . 323–325  
 snow-capped mountain  
 🏔 . . . . . 299  
 🏔 . . . . . 313  
 snowboarding  
 🏂 . . . . . 240  
 🏂 . . . . . 299  
 🏂 . . . . . 241  
 snowflake . . . . . 189, 190  
 ❄️ . . . . . 258  
 ❄️ . . . . . 189  
 ❄️ . . . . . 189  
 ❄️ . . . . . 189  
 ❄️ . . . . . 311–312  
 ❄️ . . . . . 259  
 ❄️ . . . . . 325–327  
 ❄️ . . . . . 259  
 ❄️ . . . . . 299  
 ❄️ . . . . . 190  
 ❄️ . . . . . 190  
 ❄️ . . . . . 190








































snowman 290–305, 309, 323–325  
 ..... 290  
 ..... 309  
 ..... 309  
 ..... 299  
 ..... 299  
so (س) ..... 208–210  
soap  
 ..... 323–325  
 ..... 299  
soccer ball  
 ..... 257  
 ..... 240  
 ..... 299  
sock  ..... 325–327  
socks  
 ..... 323–325  
 ..... 299  
sofa  
 ..... 325–327  
 ..... 325–327  
soft sign (ь) ..... 22  
softball (垒球) ..... 299  
solar panel (太阳能电池板) ..... 323–325  
Solaris (Solaris) ..... 318–319  
solid (田) ..... 178  
solidus (/)<sup>+</sup> ..... *see slash*  
sombrero, as math-mode accent  
 ..... 138  
SOON with arrow (soon)<sup>+</sup> 299, 313  
sort (♠) ..... 173–175  
  alpha down  
     ..... 173–175  
     ..... 173–175  
  alpha up  
     ..... 173–175  
     ..... 173–175  
  alphabetically  
    A-Z ..... 171–172  
    a-z ..... 171–172  
  amount down  
     ..... 173–175  
     ..... 173–175  
  amount up  
     ..... 173–175  
     ..... 173–175  
  down (▼) ..... 173–175  
  numeric down  
     ..... 173–175  
     ..... 173–175  
  numeric up  
     ..... 173–175

 ..... 173–175  
  numerically  
    ..... 171–172  
    ..... 171–172  
  up (▲) ..... 173–175  
SOS (sos) ..... 299  
SoundCloud (☁) ... 315–318  
Sourcetree (🍏) ..... 315–318  
South Arabian alphabet ... 207  
south node (📍) ..... 168  
sow (🌾) ..... 206  
Soyombo  
 ..... 281  
 ..... 281  
  terminal (📄) ..... 281  
soyombo (package) 281, 387, 388  
Soyombo (font) ..... 281  
Soyombo symbols ..... 281  
spa (♨) ..... 328–329  
space  
  non-breaking (␣) .... 170  
  thin ..... 380  
  visible (␣)<sup>+</sup> .... 19, 159  
space shuttle (🚀) ... 323–325  
space symbols ..... 279  
spacecraft  
 ..... 279  
 ..... 279  
spade (♠) *see playing card suits*,  
  spade  
spaghetti  
 ..... 285  
 ..... 287  
Spain (🇪🇸) ..... 244  
span (📏) ..... 208–210  
spanner ..... *see wrench*  
sparkle ..... 189, 190, 290–305  
 ..... 189  
 ..... 189  
 ..... 299  
 ..... 299  
 ..... 299  
 ..... 312  
 ..... 190  
 ..... 190  
 ..... 190  
spatula (🍴) ..... 286–287















 ..... 286–287  
Speakap (🗣) ..... 315–318  
speaker  
  muted  
    5 ..... 255  
     ..... 256  
     ..... 256  
     ..... 256  
     ..... 256  
     ..... 292  
     ..... 299  
  volume down  
    2 ..... 255  
     ..... 256  
     ..... 256  
     ..... 256  
     ..... 299  
  volume up  
    4 ..... 255  
     ..... 256  
     ..... 256  
     ..... 256  
     ..... 299  
Speaker Deck (🔊) ... 315–318  
speaking head (🗣) ..... 299  
speaking head in silhouette (🗣) ..... 313  
spear (📍) ..... 206  
“special” characters ..... 18  
special forty (🗣) ..... 257  
speech bubble  
 ..... 303  
 ..... 313  
 ..... 313  
angry  
 ..... 297  
 ..... 313  
 ..... 313  
ellipsis (⋯) ..... 299  
eye (👁) ..... 298  
multiple  
 ..... 313  
 ..... 313  
  text (🗣) ..... 313  
spell check (AB) ..... 173–175  
spherical angles .. 155, 156, 158  
spider  
 ..... 263  
 ..... 264–267  
 ..... 264–267



















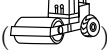
 ..... 264–267  
 ..... 299  
 ..... 314  
 spider web  
 ..... 299  
 ..... 314  
 spin () ..... 178  
   down () ..... 178  
   up () ..... 178  
 spin down () ..... 195  
 spin up () ..... 195  
 spinner () ..... 173–175  
 spiral () ..... 328  
 spiral note pad () ..... 313  
 spiral notepad () ..... 299  
 spirals ..... 339–340  
 splashing sweat () ..... 313  
 splatter () ..... 329  
 splotch () ..... 328–329  
 sponge () ..... 299  
 spoon  
    ..... 287  
    ..... 323–325  
    ..... 299  
 spoon symbols (mathematics) *see*  
   multimap, *see* multimap  
 sporting symbols ..... 290–305,  
   312–314  
 sports symbols ..... 240, 241  
 Spotify () ..... 315–318  
 spouting whale  
    ..... 262  
    ..... 268  
 spray can () ..... 323–325  
 Spring () ..... 318–319  
 Springer  
    ..... 330–331  
    ..... 330–331  
 sprinkle () ..... 208–210  
 spy () ..... 314  
 square ()<sup>+</sup> 39, 45–52, 157, 159–  
   160, 168, 171, 192–196, 198,  
   225–230, 240, 302, 333–334,  
   339–340, 358–359, 365  
   backslashed ()<sup>+</sup> ..... 51  
   backslashed, rounded cor-  
   ners () ..... 51  
   black ()<sup>+</sup> ..... 293  
   blue () ..... 294  
   brown () ..... 294  
   crossed ()<sup>+</sup> ..... 50, 196















crossed, rounded corners ()  
   ..... 50  
 diagonally striped ()<sup>+</sup> 193  
 dot ()<sup>+</sup> ..... 51, 196  
 dot, rounded corners () 51  
 dots surrounding () 198  
 dots surrounding, filled ()  
   ..... 198  
 dotted () ..... 194  
 dotted, with arrow  
    ..... 95  
    ..... 95  
 enclosing to the left () 193  
 error bars () ..... 193  
 error bars, filled () .. 193  
 filled ()<sup>+</sup> 45–47, 49, 50,  
   52, 157, 171, 192–196  
 filled, containing white circle  
   () ..... 170  
 filled, outlined ()<sup>+</sup> 51, 52,  
   193  
 filled, outlined, rounded cor-  
   ners () ..... 52  
 filled, rounded corners ()<sup>+</sup>  
   ..... 49, 52  
 filled, shadowed ()<sup>+</sup> . 195  
 green () ..... 300  
 grid () ..... 193  
 grid, diagonal () ... 193  
 half filled, bottom ()<sup>+</sup> 193,  
   197  
 half filled, left ()<sup>+</sup> . 193,  
   197  
 half filled, lower left () 193  
 half filled, lower right ()  
   ..... 193  
 half filled, right ()<sup>+</sup> 193,  
   197  
 half filled, top ()<sup>+</sup> . 193,  
   197  
 half filled, upper left ()  
   ..... 193  
 half filled, upper right ()  
   ..... 193  
 horizontally divided ()<sup>+</sup> .  
   ..... 51, 52, 197  
 horizontally divided,  
   rounded corners () . 51  
 horizontally striped () 193  
 nested, lower left () . 193  
 nested, lower right () 193  
 nested, upper left () . 193  
 nested, upper right () 193  
 of filled squares () 171–172

















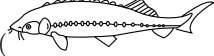

of squares () . . . 171–172  
 orange () ..... 294  
 outlined ()<sup>+</sup> ..... 49  
 outlined, rounded corners  
   () ..... 49  
 overlapping square () 193  
 purple () ..... 296  
 quartered ()<sup>+</sup> .. 49, 197  
 quartered, rounded corners  
   () ..... 49  
 red () ..... 296  
 rounded corners ()<sup>+</sup> . 48,  
   52, 193  
 shadowed ()<sup>+</sup> . 195, 199  
 slashed ()<sup>+</sup> ..... 49, 50  
 slashed, rounded corners ()  
   ..... 49  
 tick left () ..... 48  
 tick right () ..... 48  
 vertically divided ()<sup>+</sup> 50,  
   197  
 vertically divided, rounded  
   corners () ..... 50  
 vertically striped () . 193  
 white ()<sup>+</sup> ..... 302  
 white with black outline ()  
   ..... 293  
 with arrow  
    ..... 95  
    ..... 95  
   yellow () ..... 304  
 square brackets . *see* delimiters  
 square impulse ..... 164  
 square root  
   <sup>+</sup> .. 139, 141, 371–372  
   <sup>+</sup> ..... 173–175  
   with hook () ..... 372  
   without overbar  
    ..... 145  
   <sup>+</sup> ..... 157, 160  
 square wave () ..... 328–329  
 Squarespace () ..... 315–318  
 squeezer () ..... 288  
 squid () ..... 263  
 squirrel  
    ..... 264–267  
    ..... 264–267  
 squirt gun () . *see* water pistol  
 SSRN  
    ..... 330–331  
    ..... 330–331  
 staccatissimo () ..... 220  
 Stack Exchange () . 315–318






























Stack Overflow

















-  . . . . . 330–331
-  . . . . . 330–331
-  . . . . . 315–318
- stackengine (package) . . . . . 372
- StackPath  . . . . . 315–318
- \stackrel . . . . . 36, 369, 374
- stadium
  -  . . . . . 299
  -  . . . . . 314
- stairs . . . . . 310
- stamp  . . . . . 323–325
- standard state (°) . . . . . 165, 370
- standing + . . . . . 291, 295, 303
- star . 46–48, 157, 168, 189–194, 196–197, 279, 290–305, 310, 333–338
  - ☆+ . . . . . 45, 46, 189, 190, 192–194, 197, 279
  - ★+ . . . . . 37, 39, 45–47, 157, 189–194, 197, 211, 374
  - ★ . . . . . 311–312
  -  . . . . . 279
  - ★ . . . . . 299
  - and crescent + 299, 310
  - crossed out  . . . . . 197
  - dotted (☆) . . . . . 197
  - eight pointed
    - ✳+ . . . . . 189, 190, 297
    - ✳+ . . . . . 189, 190
  - Epi-Olmec  208–210
  - filled center (★)+ 189, 190
  - four pointed
    - ✦+ . . . . . 189, 190
    - ✧+ . . . . . 189, 190
  - glowing
    - ★ . . . . . 167
    - ★ . . . . . 300
  - half  . . . . . 191
  - half filled
    - ★ . . . . . 191
    - ★ . . . . . 197
    - ★ . . . . . 197
    - ★ . . . . . 197
    - ★ . . . . . 197
  - horizontally slashed (☆) 197
  - jack (♣)+ . . . . . 189
  - Jewish (✡)+ . . . . . *see star, of David*
  - knotted (☆) . . . . . 255
  - of David + . . . . . 189, 190, 192, 290–305, 310

- of David, dotted + 190, 297
- of life (✳) . . . . . 191
- open center (☆)+ 189, 190
- outlined (★)+ . . . . . 189, 190
- pentagram (☆)+ 45, 168, 178, 189, 190, 192
- pinwheel (☆)+ . . . . . 189, 190
- plus (★) . . . . . 197
- shadowed (☆)+ . . . . . 189, 190
- shooting
  -  . . . . . 167
  -  . . . . . 279
  -  . . . . . 298
- six pointed
  - ★+ . . . . . 39, 189, 190, 194
  - ✳+ . . . . . 189
- sixteen pointed  . . . . . 189
- stress outlined (☆) . . . . . 190
- twelve pointed + . . . . . 189, 190
- vertically slashed (★) . . . . . 197
- star warrior, Epi-Olmec
  -  . . . . . 208–210
  -  . . . . . 208–210
- Star Wars symbols . . . . . 315–318, 328–329
- star-struck  . . . . . 299
- starfont (package) 168, 387, 388
- stater (₮) . . . . . 32
- station
  - ♠ . . . . . 168
  -  . . . . . 321
  -  . . . . . 254
- Statue of Liberty
  -  . . . . . 299
  -  . . . . . 314
- staveless runes . . . . . 211
- staves (package) . . . . . 276, 387
- staves . . . . . 276
- StayLinked  . . . . . 315–318
- steak  . . . . . 286–287
- Steam
  -  . . . . . 315–318
  -  . . . . . 315–318
  -  . . . . . 315–318
- steamroller  325–327
- steel
  - circular (●) . . . . . 171







- flat (—) . . . . . 171
- hexagonal (●) . . . . . 171
- L (L) . . . . . 171
- octagonal (●) . . . . . 171
- rectangular (■) . . . . . 171
- rounded L (L)+ . . . . . 171
- rounded T (T)+ . . . . . 171
- rounded TT (I) . . . . . 171
- T (T) . . . . . 171
- TT (I) . . . . . 171
- steinmetz (package) . . . . . 165, 387, 388
- Steinmetz phasor notation . 165
- step (P<sup>o</sup>∞) . . . . . 208–210
- stethoscope
  -  . . . . . 319
  -  . . . . . 299
- stick (∼) . . . . . 201
- stick figures . 201, 290, 352–357
- Sticker Mule  . . . . . 315–318
- sticky note  . . . . . 323–325
- stigma
  - lowercase (Ϛ)+ . . . . . 208
  - lowercase variant (Ϛ) . 208
  - uppercase (Ϛ)+ . . . . . 208
- stix (package) . . . . . 42, 43, 47, 48, 53, 61, 62, 77, 78, 84, 89, 90, 93, 107, 109, 110, 118, 122–124, 126, 131, 137, 141, 152, 155, 156, 159, 160, 166, 169, 176, 193, 194, 213, 234, 236, 387, 388
- stmaryrd (package) . . . . . 38, 54, 68, 82, 91, 95, 112, 118, 126, 128, 365, 370, 386–388
- stock chart  . . . . . 313
- stone man (▲) . . . . . 259
- stool
  -  . . . . . 325–327
  -  . . . . . 325–327
  -  . . . . . 325–327
- stop sign
  -  . . . . . 176
  -  . . . . . 311–312
  -  . . . . . 299
- stoplight . . . . . *see traffic light*
- store  . . . . . 323–325
  - slashed + . . . . . 173–175
- stormy  . . . . . 259
- stove . . . . . *see oven*

strainer () . . . . . 200  
 Strava () . . . . . 315–318  
 strawberry  
 . . . . . 286–287  
 . . . . . 286–287  
 . . . . . 285  
 . . . . . 287  
 stream () . . . . . 173–175  
 street view () . . . . . 173–175  
 strict biconditional ( $\varepsilon\exists$ ) . . . . . 69  
 strict converse implication ( $\varepsilon-$ )<sup>+</sup>  
 . . . . . 69, 76, 77  
 strict implication ( $\rightarrow$ )<sup>+</sup> . . . . . 69, 76,  
 77  
 strikethrough () . . . . . 173–175  
 striking through ( $\diagup$ ) . . . . . 31  
 Stripe  
 . . . . . 315–318  
**S** . . . . . 315–318  
 . . . . . 315–318  
 stroked letters  
 h ( $\hbar$ )<sup>+</sup> . . . . . 123, 124  
 L ( $\mathbb{L}$ ) . . . . . 20  
 l ( $\mathbb{l}$ ) . . . . . 20  
 stroopwafel () . . . . . 323–325  
 student ()<sup>+</sup> . . . . . 291, 299, 303  
 Studio Vinari () . . . . . 315–318  
 StumbleUpon  
 . . . . . 315–318  
 . . . . . 315–318  
 sturgeon () . . . . .  
 . . . . . 264–267  
 .sty files . . . . . 16  
 subatomic particles . . . . . 177–178  
 subbunch ( $\sqsubseteq$ )<sup>+</sup> . . . . . *see* subset,  
 square  
 submap ( $\sqsubset$ )<sup>+</sup> *see* subset, square  
 submarine () . . . . . 325–327  
 subscript ( $\mathbf{x}_i$ ) . . . . . 173–175  
 subscripts  
 new symbols used in . . . . . 371  
 subset . . . . . 82–85  
 approximately equal to ( $\approx$ )  
 . . . . . 84  
 atop subset ( $\sqsupseteq$ ) . . . . . 85  
 atop superset ( $\sqsupseteq$ ) . . . . . 85  
 backslash ( $\setminus$ ) . . . . . 84  
 circle, strict ( $\odot$ ) . . . . . 84  
 closed ( $\sqsupset$ ) . . . . . 84  
 closed, strict ( $\sqsupset$ ) . . . . . 84













dotted ( $\dot{\sqsubseteq}$ ) . . . . . 84  
 dotted square ( $\boxdot$ ) . . . . . 85  
 dotted square, negated ( $\boxminus$ )  
 . . . . . 85  
 dotted square, negated strict  
 ( $\boxminus$ ) . . . . . 85  
 dotted square, strict ( $\boxdot$ ) . . . . . 85  
 dotted, strict ( $\odot$ ) . . . . . 84  
 double ( $\boxplus$ ) *see* subset, finite  
 finite ( $\boxplus$ ) . . . . . 85  
 finite square, negated strict  
 ( $\boxminus$ )<sup>+</sup> . . . . . 83, 84  
 finite, negated strict ( $\boxminus$ )<sup>+</sup> . . . . .  
 82–85  
 finite, strict ( $\boxplus$ )<sup>+</sup> . . . . . 82–85  
 finite, strict square ( $\boxplus$ )<sup>+</sup> . . . . . 83,  
 84  
 left arrow, strict ( $\leftarrow$ ) . . . . . 84  
 negated finite ( $\boxminus$ ) . . . . . 85  
 ordinary  
<sup>+</sup> . . . . . 82–85  
<sup>+</sup> . . . . . 82–85  
 ordinary, negated  
<sup>+</sup> . . . . . 82–85  
<sup>+</sup> . . . . . 82–85  
 plus ( $\boxplus$ )<sup>+</sup> . . . . . 82, 84  
 plus, strict  
 . . . . . 82, 84  
 . . . . . 85  
 proper  
 . . . . . 82  
 . . . . . 82  
 . . . . . 82  
 . . . . . 82  
 . . . . . 83  
 . . . . . 83  
 . . . . . 83  
 . . . . . 83  
 . . . . . 83  
 . . . . . 84  
 . . . . . 84  
 . . . . . 84  
 . . . . . 84  
 . . . . . 84  
 . . . . . 84  
 . . . . . 84  
 . . . . . 85  
 . . . . . 85  
 . . . . . 85  
 . . . . . 85  
 . . . . . 85  
 proper square  
<sup>+</sup> . . . . . 83–85  
<sup>+</sup> . . . . . 83, 84

right arrow, strict ( $\rightarrow$ ) . . . . . 84  
 similar to ( $\approx$ ) . . . . . 85  
 square  
<sup>+</sup> . . . . . 82–85  
<sup>+</sup> . . . . . 83, 84  
 square, negated  
<sup>+</sup> . . . . . 82–85  
<sup>+</sup> . . . . . 83–85  
 strict ( $\subset$ )<sup>+</sup> . . . . . 82–85  
 strict square ( $\sqsubset$ )<sup>+</sup> . . . . . 82–85  
 strict square, negated ( $\boxminus$ )<sup>+</sup>  
 . . . . . 82–85  
 strict, negated ( $\boxminus$ )<sup>+</sup> . . . . . 83–85  
 times, strict ( $\boxtimes$ ) . . . . . 84  
 subway () . . . . . 323–325  
 succeeds ( $\succ$ )<sup>+</sup> . . . . . 67, 70, 73, 77, 81  
 closed ( $\succ$ ) . . . . . 70  
 double  
 . . . . . 69  
<sup>+</sup> . . . . . 76, 77  
 negated ( $\succ$ )<sup>+</sup> . . . . . 68, 70, 72,  
 74, 76, 78, 81  
 or approximately equal to  
 ( $\approx$ )<sup>+</sup> . . . . . 68–70, 73, 76, 77  
 or approximately equal to,  
 negated ( $\approx$ )<sup>+</sup> . . . . . 69, 70, 72,  
 74  
 or equal to  
<sup>+</sup> . . . . . 67, 70, 73, 77, 81  
<sup>+</sup> . . . . . 68–70, 73, 76, 77  
<sup>+</sup> . . . . . 69, 73, 77  
 or equal to, negated  
<sup>+</sup> . . . . . 68, 70, 72, 74, 76,  
 78, 81  
<sup>+</sup> . . . . . 69, 75  
<sup>+</sup> . . . . . 69, 70, 72, 74, 78  
 or not approximately equal  
 to ( $\approx$ )<sup>+</sup> . . . . . 68, 70, 72, 75–77  
 or not equal to  
<sup>+</sup> . . . . . 69, 75–77  
<sup>+</sup> . . . . . 70, 75, 77  
 or not similar to ( $\approx$ )<sup>+</sup> . . . . . 68,  
 70, 72, 75–77  
 or similar to ( $\approx$ )<sup>+</sup> . . . . . 68–70,  
 73, 76, 77  
 or similar to, negated ( $\approx$ )<sup>+</sup>  
 . . . . . 69, 70, 72, 75  
 under relation ( $\succ$ )<sup>+</sup> . . . . . 76, 77  
 such that ( $\ni$ ) . . . . . 368, 370  
 sugar () . . . . . 286–287  
 suitcase . . . . . *see* luggage  
 sum ( $\Sigma$ )<sup>+</sup> . . . . . 54, 59–61  
 circular ( $\Sigma$ )<sup>+</sup> . . . . . 59–61

- horizontally extensible ( $\sum$ )  
 ..... 67
- summit  
 † ..... *see* cross (crucifix)  
 ▲ ..... *see* triangle, filled  
 △ ..... *see* triangle
- sun 166–168, 198, 253, 258, 259,  
 311–312, 335–338, 361, 365  
 ☀<sup>+</sup> ... 166, 167, 253, 258  
 ☁  
 \* ..... 208–210  
 \* ..... 170  
 ☀ ..... 311–312  
 ☀ ..... 259  
 ☀ ..... 259  
 ☀ ..... 259  
 ☀ ..... 259  
 ☀ ..... 258  
 ☀ ..... 258  
 astronomical (☉)<sup>+</sup> 166–168,  
 365  
 behind cloud  
 ☁ ..... 258  
 ☁ ..... 258  
 ☁ ..... 258  
 ☁ ..... 258  
 ☁ ..... 258  
 ☁ ..... 258  
 behind cloud with rain (☁)  
 ..... 258  
 eclipsed (●) ..... 258  
 half (☀) ..... 258  
 sunglasses (🕶) ..... 314  
 sunrise  
 ☀ ..... 300  
 ☀ ..... 312  
 over mountains  
 ☀ ..... 300  
 ☀ ..... 312  
 sunset over buildings  
 ☀ ..... 300  
 ☀ ..... 312  
 superhero (🦱)<sup>+</sup> .. 291, 300, 303  
 Superpowers (🦸) ..... 315–318  
 superscript (X<sup>1</sup>) ..... 173–175  
 superscripts  
 new symbols used in .. 371  
 superset ..... 82–85
- approximately equal to ( $\approx$ )  
 ..... 84
- atop subset ( $\supseteq$ ) ..... 85  
 atop superset ( $\supseteq$ ) ..... 85  
 circle, strict ( $\supseteq$ ) ..... 84  
 dotted ( $\supseteq$ ) ..... 85  
 dotted, strict ( $\supseteq$ ) ..... 84  
 finite square, negated strict  
 ( $\supseteq$ )<sup>+</sup> ..... 83, 84  
 finite, negated strict ( $\supseteq$ )<sup>+</sup> .  
 ..... 82–84  
 finite, strict ( $\supseteq$ )<sup>+</sup> .. 82–84  
 finite, strict square ( $\supseteq$ )<sup>+</sup> 83,  
 84  
 left arrow, strict ( $\supseteq$ ) .. 84  
 ordinary  
 $\supseteq$  ..... 82–84  
 $\supseteq$  ..... 82–84  
 ordinary, negated  
 $\supseteq$ <sup>+</sup> ..... 82–85  
 $\supseteq$ <sup>+</sup> ..... 82–85  
 plus ( $\supseteq$ )<sup>+</sup> ..... 82, 84  
 plus, strict  
 $\supseteq$ <sup>+</sup> ..... 82, 84  
 $\supseteq$  ..... 85  
 proper ( $\supseteq$ )<sup>+</sup> ..... 82–85  
 proper square  
 $\supseteq$ <sup>+</sup> ..... 83, 84  
 $\supseteq$ <sup>+</sup> ..... 83, 84  
 right arrow, strict ( $\supseteq$ ) 85  
 similar to ( $\supseteq$ ) ..... 85  
 solidus ( $\supseteq$ ) ..... 85  
 square  
 $\supseteq$ <sup>+</sup> ..... 82–84  
 $\supseteq$ <sup>+</sup> ..... 83, 84  
 square, negated  
 $\supseteq$ <sup>+</sup> ..... 83, 84  
 $\supseteq$ <sup>+</sup> ..... 82–84  
 strict ( $\supseteq$ )<sup>+</sup> ..... 82–84  
 strict square ( )<sup>+</sup> .. 82–85  
 strict square, negated ( $\supseteq$ )<sup>+</sup>  
 ..... 82–84  
 strict, negated ( $\supseteq$ )<sup>+</sup> 83–85  
 subset ( $\supseteq$ ) ..... 84  
 subset dash ( $\supseteq$ ) ..... 85  
 times, strict ( $\supseteq$ ) ..... 84
- supervillain (🦹)<sup>+</sup> . 291, 300, 303  
 Supple (🦸) ..... 315–318  
 support (🦹) ..... 171–172  
 supset  
 closed ( $\supseteq$ ) ..... 84  
 closed, strict ( $\supseteq$ ) ..... 84  
 surface ( $\supseteq$ ) ..... 178  
 surfer (🏄) ..... 241  
 surfing (🏄)<sup>+</sup> ..... 291, 295, 304
- survey sign ( $\supseteq$ ) ..... 259  
 SUSE (🐧)<sup>+</sup> ..... 315–319  
 sushi  
 🍣 ..... 285  
 🍣 ..... 287  
 suspension railway  
 🚆 ..... 321  
 🚆 ..... 254  
 SVG (🖼) ..... 318–319  
 svrsymbols (package) . 177, 387,  
 388  
 swan (🦢) ..... 263  
 swatchbook (📖) ..... 323–325  
 sweat droplets (💧) ..... 300  
 Sweden (🇸🇪) ..... 244  
 Swedo-Norwegian runes ... *see*  
 short-twig runes  
 sweet potato (🍠) . 286–  
 287  
 Swift (🚚) ..... 315–318  
 swimmer (🏊) ..... 241  
 swimming (🏊)<sup>+</sup> 240, 291, 295,  
 304  
 swimming pool (🏊) . 323–325  
 Switzerland (🇨🇭) ..... 244  
 sword  
 ⚔ ..... 206  
 = ..... 201  
 multiple, crossed (⚔)<sup>+</sup> 257,  
 275, 284, 296  
 swung dash ( $\sim$ )<sup>+</sup> .. *see* similar  
 Symbol (font) ... 121, 367, 368  
 symbols  
 academic profile . 330–331  
 alpine ..... 259  
 ancient language 200–211  
 annuity ..... 145, 374  
 astrological .... 166–168,  
 334–338  
 astronomical 166–168, 278,  
 334–338  
 Begriffsschrift ... 153, 154  
 biological ..... 176  
 block-element ..... 276  
 body-text ..... 18–35  
 bold ..... 380  
 box-drawing ..... 276  
 boxed .. 38, 45–47, 55–56  
 brand ..... 314–319  
 calendar ..... 261  
 chess .. 238–240, 290–305,  
 361–363  
 cipher ..... 278

- clock . . . . . 253, 260, 261, 311–312  
 communication . . . . . 171  
 computer hardware . . 169, 290–305, 312–314  
 contradiction . . . . 36, 118  
 cooking . . . . . 286–288  
 counties . . . . . 245–246  
 countries . . . . . 242–244  
 crystallography . . 358–359  
 currency . . . . . 31–33, 37, 159–160, 163, 290–305, 312–318  
 dangerous bend . . . . 255, 311–312  
 database . . 39–41, 67–69, 73–74, 159–160  
 definition . . . . . 36, 374  
 dictionary . . . 22–25, 275  
 digital logic . . 170, 357–358  
 dingbat . . . . . 179–199  
 disability . . . . . 320  
 electrical . . . . . 164  
 engineering 159–160, 164, 171  
 Epi-Olmec . . . . . 208–210  
 extensible . . . . . 139–142, 144–150, 165, 367, 374–375  
 Feynman diagram . . . 177  
 file . . . . . 309  
 Frege logic . . 111, 125, 153, 154, 160  
 game-related . . . 233–241, 360–363  
 genealogical . . . . . 253  
 general . . . . . 253  
 geographical . . . . 242–252  
 GINETEX . . . . . 257  
 Go stones . . . . . 240  
 Halloween . . . . . 52, 150  
 horoscope . . . . . 166–168, 335–338  
 IBM PC . . . . . 170  
 informant . . . . . 239  
 inverted . . . . . 368  
 Isthmian . . . . . 208–210  
 knitting . . . . . 282  
 Knuth’s . . . . . 255  
 laundry . . . . . 257  
 legal . . . . 19, 33, 34, 383  
 letter-like 123–125, 330–331  
 life insurance . . . 145, 374  
 Linear A . . . . . 202  
 Linear B . . . . . 205, 206  
 linear logic . . . . . 37  
 linguistic . . . . . 22–25, 30  
 log-like . . . . 118, 119, 380  
 logic . . . . . 37–39, 44, 45, 54, 58–60, 67, 81, 113–115, 123–125, 161  
*Magic: The Gathering* 361  
 magical signs . . . . . 276  
 map . . . . . 333–334  
 maps . . 242–246, 312–314  
 mathematical . . . . 36–163  
 media control . . . 255, 256, 312–314  
 medical 186, 275, 290–305, 319  
 METAFONTbook . . . . 255  
 metrical . . . . . 271, 272  
 miscellaneous 157–161, 198, 199, 253–331  
 monetary . . 31–33, 37, 163, 290–305, 312–314  
 musical 173–175, 212–232, 311–314, 328, 360  
 non-commutative division . . . . . 151  
 orchestrated objective reduction . . . . . 329  
 particle physics . . 177–178  
 peace . . 290–305, 311–312, 328–329  
 Phaistos disk . . . . . 200  
 phonetic . . . . . 22–25, 30  
 physical . . . . . 164  
 Pitman’s base 12 155, 269  
 present value . . . 145, 374  
 proto-Semitic . . . . . 201  
 pulse diagram . . . . . 164  
 recycling . . 279, 280, 284, 290–305, 311–312, 332  
 relational . . . . . 67, 81  
 religious 186, 187, 257, 310, 333  
 reversed . . . . . 368  
 rotated . . . . . 368  
 runes . . . . . 211  
 safety-related . . . . . 176  
 scientific 164–178, 358–359  
 semaphore . . . . . 355–357  
 Simpsons characters . . 306  
 smiles and frowns . . 67, 68, 73–78, 116, 117  
 Soyombo . . . . . 281  
 space . . . . . 279  
 spoon (mathematics) 115, 117  
 sporting 290–305, 312–314  
 sports . . . . . 240, 241  
 Star Wars . . . . . 315–318, 328–329  
 staves . . . . . 276  
 subset and superset 82–85  
 technological . . . 164–178  
 T<sub>E</sub>Xbook . . . . . 255  
 transliteration . . . . 25, 30  
 transportation . . . . 254, 320–321  
 upside-down . . 368, 381–382  
 user-interface . . . 171–175  
 variable-sized . . 54–66, 366  
 VLSI . . . . . 357–358  
 weather 258, 259, 311–312  
 Web . . . . . 330–331  
 yin-yang 257, 284, 290–305, 310–312, 339–340  
 zodiac . . 166–168, 335–338  
**symbols.tex** (file) . . . 364, 387  
 Symphony (♫)<sup>+</sup> . . . . . 315–319  
 synagogue  
    . . . . . 310  
    . . . . . 300  
    . . . . . 310  
 sync (↻)<sup>+</sup> . . . . . 173–175  
 syringe  
    . . . . . 319  
    . . . . . 300  
    . . . . . 312  
  

### T

  
 T (  ) . . . . . 21, 270  
 T-shirt  
    . . . . . 323–325  
    . . . . . 300  
    . . . . . 281  
**t4phonet** (package) . . 25, 29, 387, 388  
 table (♠) . . . . . 173–175  
 table tennis . . . . *see* ping pong  
 tablet  
    . . . . . 321  
    . . . . . 323–325  
    . . . . . 322  
 tabs (☐) . . . . . 171–172  
 tachyon (♯) . . . . . 178  
 tack (⊥)<sup>+</sup> . . . . . *see* turnstile  
 taco  
    . . . . . 285  
    . . . . . 287  
 tag  
    . . . . . 323–325  
    . . . . . 322

tailed letters


c (c)<sup>+</sup> . . . . . 22, 24  
 c, stretched  
   c̄ . . . . . 23  
   c̆ . . . . . 23  
 d  
   d . . . . . 22  
   d̄ . . . . . 23  
   d<sup>+</sup> . . . . . 24, 25  
 d, with hook (ḍ) . . . . . 22  
 esh (f)<sup>+</sup> . . . . . 22, 24  
 h, with hook (ḥ) . . . . . 24  
 j (j)<sup>+</sup> . . . . . 23  
 l (l)<sup>+</sup> . . . . . 23, 24  
 m (m) . . . . . 22  
 n  
   n<sup>+</sup> . . . . . 22, 25  
   n̄<sup>+</sup> . . . . . 22, 24  
   n̆ . . . . . 23  
 r (r)<sup>+</sup> . . . . . 22, 24  
 s  
   s̄ . . . . . 22  
   s̆ . . . . . 24  
 t  
   t<sup>+</sup> . . . . . 22, 24  
   t̄ . . . . . 23  
   t̆ . . . . . 25  
 t, inverted (ṭ) . . . . . 23  
 z  
   z . . . . . *see* round z  
   z̄ . . . . . 22  
   z̆ . . . . . 22  
   z<sup>+</sup> . . . . . 23, 25  
   ẓ . . . . . 24  
 takeout box (☒) . . . . . 285  
 taking bath (♨) . . . . . 295  
 tally markers . . . . . 205, 268, 269  
   | | | | | | | | . . . . . 269  
   | || ||| |||| |||| . . . . . 268  
 tamale (🌮) . . . . . 285  
 tangerine  
   🍊 . . . . . 285  
   🍋 . . . . . 287  
 tape  
   📼 . . . . . 198  
   📀 . . . . . 323–325  
   📁 . . . . . 199  
 tape cartridge (📀) . . . . . 312  
 target  
   🎯 . . . . . 325–327  
   🎯 . . . . . 241  
 tasks (☑) . . . . . 173–175  
 Tate-Shafarevich group *see* sha



tattooed head (👤) . . . . . 200  
 tau  
   lowercase (τ)<sup>+</sup> 20, 120, 121  
   uppercase (T)<sup>+</sup> . . . . . 20, 120  
 tau lepton  
   minus (τ<sup>-</sup>) . . . . . 178  
   plus (τ<sup>+</sup>) . . . . . 178  
 Taurus (♉)<sup>+</sup> . . . . . 166–168, 300,  
   335–338  
 tautology (T)<sup>+</sup> . . . *see* turnstile,  
   down  
 taxi . . . . . 254, 320  
   🚕 . . . . . 320  
   🚗 . . . . . 323–325  
   🚘 . . . . . 321  
   🚙 . . . . . 320  
   🚚 . . . . . 254  
   🚛 . . . . . 254  
 tea kettle (🍵) . . . . . 286–287  
 teacher (👩)<sup>+</sup> . . . . . 291, 300, 304  
 teacup without handle  
   🍵 . . . . . 285  
   🍵 . . . . . 287  
 TeamSpeak (🗣) . . . . . 315–318  
 teapot (🍵) . . . . . 285  
 technical (⊕) . . . . . 275  
 technological symbols 164–178  
 technologist (👩)<sup>+</sup> 291, 300, 304  
 teddy bear (🧸) . . . . . 300  
 teeth (🦷) . . . . . 323–325  
 Telegram  
   📠 . . . . . 315–318  
   📡 . . . . . 315–318  
 telephone  
   ☎ . . . . . 198  
   📞 . . . . . 171  
   📞 . . . . . 270  
   📞 . . . . . 281  
   📞 . . . . . 325–327  
   📞 . . . . . 329  
   📞 . . . . . 253  
   📞 . . . . . 300  
   📞 . . . . . 312–314  
   📞 . . . . . 312–314  
 telephone handset (📞)<sup>+</sup> . . . . . 300,  
   312–314, 321–325, 329  
   atop modem (📞)<sup>+</sup> 312–314  
   circled (ⓞ)<sup>+</sup> . . . *see* circled  
   symbols, telephone handset  
   inverse (📞)<sup>+</sup> . . . . . 328–329  
   slashed (📞) . . . . . 328–329




volume (📖) . . . . . 328–329  
   with page (📖)<sup>+</sup> . . . . . 312–314  
 telescope  
   🔭 . . . . . 300  
   👁 . . . . . 313  
   man looking through (👁) .  
   . . . . . 318–319  
 television  
   📺 . . . . . 323–325  
   📺 . . . . . 325–327  
   📺 . . . . . 300  
   📺 . . . . . 312  
 temperature  
   high (🌡) . . . . . 259  
   low (🌡) . . . . . 259  
 ten thousandths (‰)<sup>+</sup> . . . *see*  
   permyriad  
 Tencent QQ (👤) . . . . . 315–318  
 Tencent Weibo (👤) . . . . . 315–318  
 tenge (₸) . . . . . 32  
 Tennent, Bob . . . . . 36  
 tennis ball (🎾) . . . . . 300  
 tennis racquet and ball (🎾) 241  
 tensor product (⊗) . . . *see* circled  
   symbols, multiplication  
 tent  
   🏕 . . . . . 259  
   🏕 . . . . . 325–327  
   🏕 . . . . . 300  
 tenuto (◡) . . . . . 220  
 terminal (➤) . . . . . 173–175  
 terminus  
   ⊗<sup>+</sup> . . . . . 271  
   ⊕<sup>+</sup> . . . . . 271  
 test tube (🧪) . . . . . 300  
**testfont.dvi** (file) . . . . . 378  
**testfont.tex** (file) . . . . . 377, 378  
 tetartemorion (⤴) . . . . . 32  
 tetrahedron (🔺) . . . . . 311–312  
 teubner (package) 32, 153, 208,  
   272, 387, 388  
 T<sub>E</sub>X . . . . . 16, 17, 43,  
   66, 67, 81, 92, 93, 111, 138,  
   143, 147, 148, 152, 162, 165,  
   246, 276, 366–375, 377–380,  
   382, 384, 385, 390  
   .tex files . . . . . 384, 385  
 T<sub>E</sub>Xbook, The . . . . . 368, 369,  
   371–373, 375, 379  
   symbols from . . . . . 255  
 text height (T<sub>I</sub>) . . . . . 173–175





- text width (📏) . . . . . 173–175
- textcomp (package) . . . 16, 19, 26, 31, 33, 34, 94, 135, 160, 165, 212, 253, 364, 382, 384, 387, 388
- textgreek (package) 20, 121, 387, 388
- .tfm files 16, 162, 332, 366, 385
- tfruppee (package) . 32, 387, 388
- Thành, Hàn Thê . . . . . 373
- The Red Yeti (👹) . . . 315–318
- theater masks (🎭) . . 323–325
- Themeco (🐼) . . . . . 315–318
- Themeisle (🎵) . . . . . 315–318
- therefore (∴)<sup>+</sup> . . 40, 68, 69, 76, 151–153
- down (∴)<sup>+</sup> . . . . . 39, 68, 76, 151–153
- left (∴)<sup>+</sup> . . . . . 40, 152
- right (∴)<sup>+</sup> . . . . . 39, 152
- thermodynamic (♯) . . . . . 159
- thermometer 258, 259, 323–325
- 🌡️ . . . . . 259
- 🌡️ . . . . . 259
- 🌡️ . . . . . 258
- 🌡️ . . . . . 258
- empty (🌡️) . . . . . 259
- full (🌡️) . . . . . 259
- half (🌡️) . . . . . 259
- quarter (🌡️) . . . . . 259
- three quarters (🌡️) . . . . 259
- theta
- lowercase ( $\theta$ )<sup>+</sup> . 20, 22, 24, 120, 121
- lowercase variant ( $\vartheta$ )<sup>+</sup> 120–122
- uppercase ( $\Theta$ )<sup>+</sup> . 20, 120, 121
- thin fog (🌫️) . . . . . 258
- thin space . . . . . 380
- ThinkPeaks (🐅) . . . . . 315–318
- thirty-second note (🎵)<sup>+</sup> 215–218
- dotted (🎵)<sup>+</sup> . . . . . 216–218
- double dotted (🎵)<sup>+</sup> . 217, 218
- rest (🎵)<sup>+</sup> . . . . . 214, 215
- thorn
- lowercase (þ)<sup>+</sup> . 20, 22, 24, 25, 383
- uppercase (Þ)<sup>+</sup> 20, 25, 383
- thought bubble
- 💭 . . . . . 300
- 🗨️ . . . . . 313
- 🗨️ . . . . . 313
- text (🗨️) . . . . . 313
- thousandths (‰)<sup>+</sup> *see* per mill
- thread
- 🧵 . . . . . 201
- 🧵 . . . . . 201
- 🧵 . . . . . 300
- Threadprint (🖨️) . . . . 318–319
- throat (🗨️) . . . . . 325–327
- throne (👑) . . . . . 208–210
- thumb pizzicato (👉) . . . . . 220
- thumbtack . . . . . *see* pushpin
- thus (∴)<sup>+</sup> . . . . . *see* therefore
- tiaara (👑) . . . . . 200
- tick marks . . . . . *see* check marks
- ticket
- 🎫 . . . . . 322
- 🎫 . . . . . 300
- 🎫 . . . . . 313
- tiger
- 🐅 . . . . . 263
- 🐅 . . . . . 263
- 🐅 . . . . . 268
- 🐅 . . . . . 268
- TikTok (🎵) . . . . . 315–318
- TikZ (package) . . . 17, 26, 167, 176, 181, 183–185, 187–190, 196–199, 213, 234–238, 241, 248, 249, 254, 256, 258–260, 267, 268, 270, 279, 281, 283, 287–290, 307, 309, 310, 312, 314, 329, 331, 346, 348, 373
- tikzsymbols (package) . 288–290, 387, 388
- tilde (~) . 19, 22–28, 31, 34, 37, 136, 139, 144, 374, 382
- extensible . . . . . 139, 144
- lowered (~) . . . . . 34, 382
- vertically centered . . . 382
- time
- 🕒 . . . . . 208–210
- 🕒 . . . . . 208–210
- time interval (🕒) . . . . . 260
- time of day . . . . . 260, 261
- time signatures . 212, 216, 217, 219, 220
- times (×)<sup>+</sup> . 37, 38, 40–42, 69, 160
- big (×)<sup>+</sup> . . . . . 55, 59, 61
- closed bottom (×)<sup>+</sup> 39–43
- closed left (×)<sup>+</sup> . . . 38–42
- closed left and right (⌘)<sup>+</sup> . . . . . 41, 69
- closed right (×)<sup>+</sup> . . 38–43
- closed top (×)<sup>+</sup> 40, 41, 43
- closed top and bottom (⌘) . . . . . 43
- decorative
- × . . . . . 154
- × . . . . . 156, 188
- × . . . . . 157, 188
- × . . . . . 188
- × . . . . . 188
- × . . . . . 292
- dotted (×)<sup>+</sup> 37, 39, 41, 43
- double (×) . . . . . 211
- filled left (×)<sup>+</sup> . . . . 42, 77
- filled right (×)<sup>+</sup> . . . 41, 78
- half rim, left (⊗) . . . . . 43
- half rim, right (⊗) . . . . 43
- hollow (⊗)<sup>+</sup> . . . . . 156, 188
- underbar (⊗)<sup>+</sup> . . . . . 40, 42
- vector (×) . . . . . 43
- Times Roman (font) . . 32, 366
- timing (package) . . . . . 164
- tint (🌊) . . . . . 173–175
- slashed (🌊) . . . . . 173–175
- tipa (package) 22, 23, 25, 26, 28, 29, 368, 387, 388
- tipping hand (👉)<sup>+</sup> 291, 295, 304
- tipx (package) . . . 23, 387, 388
- title
- 📖 . . . . . 208–210
- 📖 . . . . . 208–210
- 📖 . . . . . 208–210
- to (👉) . . . . . 208–210
- toggle off (🔘) . . . . . 173–175
- toggle on (🔘) . . . . . 173–175
- toilet
- 🚽 . . . . . 323–325
- 🚽 . . . . . 325–327
- 🚽 . . . . . 300
- 🚽 . . . . . 254
- toilet paper
- 🚽 . . . . . 323–325
- 🚽 . . . . . 325–327




slashed () . . . . . 328–329



Tokyo tower  
 . . . . . 300  
 . . . . . 314


tomato  
 . . . . . 286–287  
 . . . . . 285  
 . . . . . 287



tombstone () . . . . . 300


Tomcat () . . . . . 318–319

tongue  
 . . . . . 325–327  
 . . . . . 300  
 . . . . . 312


toolbox  
 . . . . . 323–325  
 . . . . . 300


tools () . . . . . 312–314, 323–325


tooth  
 . . . . . 323–325  
 . . . . . 300


toothbrush () . . . . . 300



top (T)<sup>+</sup> . . . *see* turnstile, down  
 above bottom (I)<sup>+</sup> . . . 124,  
 371, 372

top hat, as math-mode accent  
 . . . . . 138


TOP with arrow ()<sup>+</sup> 300, 313


torah () . . . . . 310



torii gate () . . . . . 310






tornado  
 . . . . . 325–327  
 . . . . . 258


torus (T) *see* alphabets, math

toucan () . . . . . 264–267










towel () . . . . . 325–327


trackball  
 . . . . . 300  
 . . . . . 312














tractor  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 325–327  
 . . . . . 321  
 . . . . . 254






Trade Federation () 315–318













trademark (TM)<sup>+</sup> . . . . . *see* legal symbols, trademark


traffic light  
 . . . . . 311–312  
 . . . . . 311–312  
 . . . . . 311–312  
 . . . . . 311–312  
 . . . . . 323–325  
 . . . . . 321  
 . . . . . 321  
 . . . . . 254  
 . . . . . 254

trailer () . . . . . 323–325

train . . . . . 254, 320  
 . . . . . 320  
 . . . . . 275  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 321  
 . . . . . 321  
 . . . . . 320  
 . . . . . 321  
 . . . . . 254  
 . . . . . 254  
 . . . . . 254  
 . . . . . 254  
 . . . . . 254

tram  
 . . . . . 323–325  
 . . . . . 321  
 . . . . . 321  
 . . . . . 254  
 . . . . . 254

transform . . . *see also* alphabets,  
 math  
 . . . . . 80  
 . . . . . 148  
 . . . . . 148  
 . . . . . 80  
 . . . . . 76, 80  
 . . . . . 76, 80  
 . . . . . 76, 80  
 . . . . . 76, 80  
 . . . . . 80  
 . . . . . 80  
 . . . . . 80  
 . . . . . 80


transgender ()<sup>+</sup> . . . *see* gender signs, male with stroke and male and female






transliteration symbols . . . 25, 30






transportation symbols . . . 254, 320–321


transpose . . . . . 38


transversal intersection (rh)<sup>+</sup> *see* pitchfork




trapezoid () . . . . . 193



trash  
 . . . . . 323–325  
 . . . . . 322  
 . . . . . 301  
 . . . . . 313  
 restore from ()<sup>+</sup> 173–175



tree . . . . . 289, 361  
 . . . . . 289  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 343–346  
 . . . . . 322




apple () . . . . . 325–327


autumn () . . . . . 289


Christmas  
 . . . . . 295  
 . . . . . 312  
 . . . . . 325–327


deciduous  
 . . . . . 281  
 . . . . . 297



evergreen  
 . . . . . 281  
 . . . . . 298


palm  
 . . . . . 281  
 . . . . . 294  
 . . . . . 325–327


plane () . . . . . 200


spring () . . . . . 289

summer () . . . . . 289

tanabata  
 . . . . . 300  
 . . . . . 312



































winter () . . . . . 289
















Trello () . . . . . 315–318

tréma ()<sup>+</sup> *see* accents, diæresis

















































trfsigns (package) . . . 80, 124, 148, 387

triangle ( $\triangle$ )<sup>+</sup> . . . 16, 37, 38, 42, 43, 45–52, 54, 87, 89, 91–93, 157, 159–161, 168, 170, 192–197, 225–230, 240, 259, 333–334, 358–359, 365  
 bar through ( $\triangleleft$ )<sup>+</sup> 47, 159  
 bar under ( $\triangle$ )<sup>+</sup> 37, 38, 42, 87, 89, 92, 193  
 containing filled triangle ( $\triangle$ )<sup>+</sup> . . . . . 50–52  
 containing triangle ( $\triangle$ ) 194  
 crossed ( $\triangle$ )<sup>+</sup> 50, 196, 197  
 dot over ( $\triangle$ ) . . . . . 193  
 dotted ( $\triangle$ )<sup>+</sup> . . . 50, 51, 193, 196, 197  
 enclosing  $\triangle$  . . . . . 193  
 equals ( $\triangle$ )<sup>+</sup> . . . 87, 91–93  
 equals, negated ( $\ntriangle$ )<sup>+</sup> . . . 87, 91–93  
 filled ( $\blacktriangle$ )<sup>+</sup> . . . . . 38, 45–50, 52, 91–93, 157, 170, 192–197, 253, 255, 259, 365  
 half filled ( $\blacktriangledown$ )<sup>+</sup> . . . 193, 194, 196, 197  
 horizontally divided ( $\triangle$ )<sup>+</sup> . . . . . 51, 196, 197  
 impossible ( $\triangle$ ) . . . . . 290  
 minus ( $\triangle$ ) . . . . . 47  
 multiplication ( $\triangle$ ) . . . 47  
 negated ( $\ntriangle$ )<sup>+</sup> . . . 87, 91–93  
 one third filled ( $\blacktriangledown$ )<sup>+</sup> . . . 196, 197  
 outlined ( $\triangle$ )<sup>+</sup> . . . . 48, 49  
 plus ( $\triangle$ ) . . . . . 47  
 quartered ( $\triangle$ )<sup>+</sup> . . . 49, 196, 197  
 red ( $\blacktriangledown$ )<sup>+</sup> . . . . . 296, 297  
 right ( $\triangle$ )<sup>+</sup> . . . 93, 192–194  
 right, equals ( $\triangle$ ) . . . . . 93  
 right, filled ( $\blacktriangle$ )<sup>+</sup> . . . . 193  
 rounded corners ( $\triangle$ ) . . . 254  
 s ( $\triangle$ ) . . . . . 193  
 serifs ( $\triangle$ ) . . . . . 47  
 slashed ( $\triangleright$ )<sup>+</sup> . . . . . 49, 51  
 striped ( $\blacktriangle$ )<sup>+</sup> . . . . . 196  
 two ( $\triangle$ ) . . . . . 93  
 two thirds filled ( $\blacktriangledown$ )<sup>+</sup> 196, 197  
 vertical bar ( $\triangleleft$ )<sup>+</sup> . . . . 93  
 vertically divided ( $\triangle$ )<sup>+</sup> 50, 196, 197  
 triangle relations . . . . . 91–93  
 tribar ( $\triangle$ ) . . . . . *see* triangle, impossible

tricycle () . . . . . 325–327  
 trident  
   | . . . . . 288  
    . . . . . 301  
    . . . . . 313  
 trigonometric functions 118, 119  
 trill ( $\blacktriangleleft$ ) . . . . . 214  
 trine ( $\triangle$ ) . . . . . 168  
 trolleybus  
    . . . . . 321  
    . . . . . 254  
 trophy  
    . . . . . 323–325  
    . . . . . 301  
    . . . . . 241  
 tropical drink  
    . . . . . 285  
    . . . . . 287  
 trsym (package) . . . 80, 387, 388  
 truck  
    . . . . . 323–325  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 325–327  
    . . . . . 320  
    . . . . . 320  
    . . . . . 254  
   fast () . . . . . 328  
 true (T) . . . . . 125  
 trumpet  
    . . . . . 301  
    . . . . . 313  
 trunk () . . . . . 325–327  
 TTY () . . . . . 320

TUGboat . . . . . 139, 390  
 tuki () . . . . . 208–210  
 tukpa () . . . . . 208–210  
 tulip  
    . . . . . 325–327  
    . . . . . 301  
    . . . . . 281  
 tumble dry ( $\square$ ) . . . . . 257  
 tumbler glass () . . . . . 285  
 Tumblr  
    . . . . . 315–318  
    . . . . . 315–318  
    . . . . . 314  
    . . . . . 314  
 turkey  
    . . . . . 264–267  
    . . . . . 264–267  
    . . . . . 263  
 turn () . . . . . 214  
   reversed () . . . . . 214  
 turnstile (package)<sup>+</sup> 79, 80, 387, 388  
 turnstile  
   double bar, double dash, down ( $\overline{\overline{\quad}}$ )<sup>+</sup> . . . . . 71, 74  
   double bar, double dash, down, negated ( $\overline{\overline{\nmid}}$ )<sup>+</sup> . . . 72, 75  
   double bar, double dash, left ( $\overline{\overline{||}}$ )<sup>+</sup> 69, 70, 73, 74, 76, 77  
   double bar, double dash, left and right ( $\overline{\overline{|||}}$ ) . . . . . 77  
   double bar, double dash, left, negated ( $\overline{\overline{\nmid}}$ )<sup>+</sup> 70, 72, 74, 75  
   double bar, double dash, northeast ( $\overline{\overline{\swarrow}}$ ) . . . . . 70  
   double bar, double dash, northeast, negated ( $\overline{\overline{\nwarrow}}$ ) 72  
   double bar, double dash, northwest ( $\overline{\overline{\nwarrow}}$ ) . . . . . 71  
   double bar, double dash, northwest, negated ( $\overline{\overline{\swarrow}}$ ) 72  
   double bar, double dash, right ( $\overline{\overline{||}}$ )<sup>+</sup> 69, 71, 73, 74, 76, 78  
   double bar, double dash, right, negated ( $\overline{\overline{\nmid}}$ )<sup>+</sup> . . . 68, 70, 72, 73, 75, 76, 78

- double bar, double dash, southeast ( $\llcorner$ ) . . . . . 70
- double bar, double dash, southeast, negated ( $\llcorner$ ) 72
- double bar, double dash, southwest ( $\lrcorner$ ) . . . . . 71
- double bar, double dash, southwest, negated ( $\lrcorner$ ) 72
- double bar, double dash, up ( $\underline{\_}$ )<sup>+</sup> . . . . . 71, 74
- double bar, double dash, up, negated ( $\underline{\_}$ )<sup>+</sup> . . . . . 72, 75
- double bar, down ( $\bar{\_}$ )<sup>+</sup> 71, 73, 74, 77, 160
- double bar, down, negated ( $\bar{\_}$ )<sup>+</sup> . . . . . 72, 75
- double bar, left ( $\_+$ )<sup>+</sup> . 70, 73, 74, 76, 77
- double bar, left and right ( $\_+$ ) . . . . . 77
- double bar, left, negated ( $\_+$ )<sup>+</sup> . . . . . 70, 72, 74, 75
- double bar, northeast ( $\swarrow$ ) . . . . . 70
- double bar, northeast, negated ( $\swarrow$ ) . . . . . 72
- double bar, northwest ( $\searrow$ ) . . . . . 71
- double bar, northwest, negated ( $\searrow$ ) . . . . . 72
- double bar, right ( $\_+$ )<sup>+</sup> 68–71, 73, 74, 76, 78, 81
- double bar, right, negated ( $\_+$ )<sup>+</sup> . 69, 70, 72, 73, 75, 76, 78, 81
- double bar, southeast ( $\swarrow$ ) . . . . . 70
- double bar, southeast, negated ( $\swarrow$ ) . . . . . 72
- double bar, southwest ( $\searrow$ ) . . . . . 71
- double bar, southwest, negated ( $\searrow$ ) . . . . . 72
- double bar, triple dash, right ( $\equiv$ ) . . . . . 81
- double bar, triple dash, right, negated ( $\equiv$ ) . . . . . 81
- double bar, up ( $\underline{\_}$ )<sup>+</sup> 71, 74, 78
- double bar, up, negated ( $\underline{\_}$ )<sup>+</sup> . . . . . 72, 75
- double bar, wavy dash, right ( $\_$ ) . . . . . 81
- double bar, wavy dash, right, negated ( $\_$ ) . . . . . 81
- double bar, wavy double dash, right ( $\_$ ) . . . . . 81
- double bar, wavy double dash, right, negated ( $\_$ ) . . . . . 81
- double dash, down ( $\_$ )<sup>+</sup> 71, 74, 77
- double dash, down, negated ( $\_$ )<sup>+</sup> . . . . . 72, 75
- double dash, left ( $\_$ )<sup>+</sup> 69, 70, 73, 74, 76, 77, 368
- double dash, left, negated ( $\_$ )<sup>+</sup> . . . . . 70, 72, 74, 75
- double dash, northeast ( $\swarrow$ ) . . . . . 70
- double dash, northeast, negated ( $\swarrow$ ) . . . . . 72
- double dash, northwest ( $\searrow$ ) . . . . . 71
- double dash, northwest, negated ( $\searrow$ ) . . . . . 72
- double dash, right ( $\_$ )<sup>+</sup> 67–69, 71, 73, 74, 76–78, 81, 368
- double dash, right, negated ( $\_$ )<sup>+</sup> . 68, 70, 72, 73, 75, 76, 78, 81
- double dash, southeast ( $\swarrow$ ) . . . . . 70
- double dash, southeast, negated ( $\swarrow$ ) . . . . . 72
- double dash, southwest ( $\searrow$ ) . . . . . 71
- double dash, southwest, negated ( $\searrow$ ) . . . . . 72
- double dash, up ( $\underline{\_}$ )<sup>+</sup> . 69, 71, 74, 76, 78, 81, 125, 371
- double dash, up, negated ( $\underline{\_}$ )<sup>+</sup> . . . . . 72, 75
- down ( $\_$ )<sup>+</sup> . 38, 71, 74, 77, 123–125, 159, 371
- down, negated ( $\_$ )<sup>+</sup> 72, 75, 123, 159
- left ( $\_$ )<sup>+</sup> 67, 70, 71, 73, 74, 77
- left, long ( $\_$ )<sup>+</sup> 73, 74, 77
- left, long, negated ( $\_$ )<sup>+</sup> 75
- left, negated ( $\_$ )<sup>+</sup> . . . . . 70, 72–75
- northeast ( $\swarrow$ ) . . . . . 70
- northeast, negated ( $\swarrow$ ) 72
- northwest ( $\searrow$ ) . . . . . 71
- northwest, negated ( $\searrow$ ) 72
- right ( $\_$ )<sup>+</sup> . 67, 70, 71, 73, 74, 77, 78, 81
- right, long ( $\_$ )<sup>+</sup> 73, 74, 78
- right, long, negated ( $\_$ )<sup>+</sup> . . . . . 74, 75
- right, negated ( $\_$ )<sup>+</sup> 68, 70, 72, 73, 75, 76, 78, 81
- short bar, down ( $\_$ ) . . . . . 71
- short bar, down, negated ( $\_$ ) . . . . . 72
- short bar, down, ring below ( $\_$ ) . . . . . 159
- short bar, left ( $\_$ )<sup>+</sup> 71, 74
- short bar, left, negated ( $\_$ )<sup>+</sup> . . . . . 72, 75
- short bar, northeast ( $\swarrow$ ) 71
- short bar, northeast, negated ( $\swarrow$ ) . . . . . 72
- short bar, northwest ( $\searrow$ ) 70
- short bar, northwest, negated ( $\searrow$ ) . . . . . 72
- short bar, right ( $\_$ )<sup>+</sup> 70, 73
- short bar, right, negated ( $\_$ )<sup>+</sup> . . . . . 72, 74
- short bar, southeast ( $\swarrow$ ) 71
- short bar, southeast, negated ( $\swarrow$ ) . . . . . 72
- short bar, southwest ( $\searrow$ ) 70
- short bar, southwest, negated ( $\searrow$ ) . . . . . 72
- short bar, up ( $\_$ ) . . . . . 71
- short bar, up, negated ( $\_$ ) 72
- short bar, up, ring above ( $\_$ ) . . . . . 77
- southeast ( $\swarrow$ ) . . . . . 70
- southeast, negated ( $\swarrow$ ) 72
- southwest ( $\searrow$ ) . . . . . 71
- southwest, negated ( $\searrow$ ) 72
- triple bar, double dash, right ( $\equiv$ ) . . . . . 69
- triple bar, left ( $\_$ )<sup>+</sup> 69, 73
- triple bar, left, negated ( $\_$ )<sup>+</sup> . . . . . 70, 75
- triple bar, right ( $\_$ )<sup>+</sup> . 68, 69, 71, 74, 76, 78
- triple bar, right, negated ( $\_$ )<sup>+</sup> . . . . . 70, 75
- triple dash, left ( $\equiv$ ) . . . . . 73
- triple dash, left, negated ( $\equiv$ ) . . . . . 75
- triple dash, right ( $\equiv$ )<sup>+</sup> 74, 78, 81
- triple dash, right, negated ( $\equiv$ )<sup>+</sup> . . . . . 75, 81
- up ( $\underline{\_}$ )<sup>+</sup> 36, 67, 71, 73, 74, 77, 123–125, 159, 371

- up over down ( $\updownarrow$ ) . . . . . 78  
up, negated ( $\upneg$ )<sup>+</sup> . . . . . 70, 72, 73, 75, 123, 159  
up, with s ( $\upsh$ ) . . . . . 160  
wavy bar, up ( $\upwavy$ )<sup>+</sup> 81, 125, 161  
wavy dash, right ( $\updash$ ) . . . . . 81  
wavy dash, right, negated ( $\updashneg$ ) . . . . . 81  
wavy double dash, right ( $\upddash$ ) . . . . . 81  
wavy double dash, right, negated ( $\upddashneg$ ) . . . . . 81
- turtle  
 . . . . . 208–210  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 264–267  
 . . . . . 263  
 . . . . . 268
- `\twemoji` . . . . . 234, 249–252, 258, 261–263, 278, 283–285, 290–305, 320, 321  
twemojis (package) 234, 249, 252, 258, 261–263, 278, 283–285, 290, 305, 320, 321, 387–389
- twiddle . . . . . *see* tilde  
Twitch () . . . . . 315–318  
Twitter  
 . . . . . 315–318  
 . . . . . 315–318  
 . . . . . 314  
 . . . . . 314
- txfonts (package) . . . . . 36, 39, 56, 69, 82, 86, 95, 118, 121–123, 157, 158, 162, 233, 364, 366, 382, 387, 388
- type1cm (package) . . . . . 366  
Type 1 (font) . . . . . 379  
typicons (package) 156, 171, 172, 182, 183, 185, 188, 191, 255, 256, 259, 261, 308, 309, 314, 322, 328, 387, 388
- tzetze () . . . . . 208–210
- U**
- U () . . . . . 270  
u  
descending ( $\udown$ ) . . . . . 25  
Uber () . . . . . 315–318
- ubulb.fd (file) . . . . . 378, 379  
Ubuntu  
 . . . . . 315–318  
 . . . . . 318–319  
ucs (package) . . . . . 385  
udingbat.fd (file) . . . . . 342  
UIKit () . . . . . 315–318  
ulsy (package) 44, 118, 367, 387  
Umbraco () . . . . . 315–318  
umbrella  
 . . . . . 323–325  
 . . . . . 325–327  
 . . . . . 301  
closed  
 . . . . . 295  
 . . . . . 312  
on ground () . . . . . 301  
with rain drops () . . . . . 301  
umlaut ( $\uuml$ )<sup>+</sup> . . . . . *see* accents, diaeresis  
umranda (package) 339, 340, 387  
umrandb (package) 340, 341, 387  
unary operators . . . . . 37  
Uncharted () . . . . . 315–318  
\underraccent . . . . . 374  
underline  
 $\_$ <sup>+</sup> 18, 19, 36, 37, 139, 145, 170, 382  
<sup>+</sup> . *see* accents, underline  
 . . . . . 173–175  
underscore (package) . . . . . 18  
underscore . . . . . *see* underline  
\underset . . . . . 369  
undertilde (package) . . . . . 144, 387, 388  
undo ()<sup>+</sup> . . . . . 173–175  
ungroup objects  
 . . . . . 173–175  
 . . . . . 173–175
- Unicode . . . . . 17, 276, 384–386  
unicorn () . . . . . 263  
union ( $\cup$ )<sup>+</sup> . . . . . 37, 39–43, 54, 58, 59, 61, 161, 369, 379  
bar ( $\bar{\cup}$ ) . . . . . 42  
bar, intersection ( $\bar{\cap}$ ) . . . . . 43  
closed ( $\bar{\cup}$ ) . . . . . 42  
closed, smash product ( $\bar{\cap}$ ) . . . . . 42  
dotted ( $\dot{\cup}$ )<sup>+</sup> 36, 40, 43, 58, 59, 61, 66, 369, 379  
double ( $\cup\cup$ )<sup>+</sup> . . . . . 38–43  
left arrow ( $\cupleftarrow$ )<sup>+</sup> 42, 43, 105  
over intersection ( $\overline{\cap}$ ) . . . . . 43
- plus ( $\oplus$ )<sup>+</sup> . . . . . 37, 39–42, 54, 58–61  
square ( $\sqcup$ )<sup>+</sup> 36, 37, 39, 40, 42, 54, 59, 61, 161  
square, dotted ( $\sqcup\dot{\phantom{a}}$ )<sup>+</sup> 39, 40, 58–60  
square, double ( $\sqcup\sqcup$ )<sup>+</sup> 39–42  
square, half  
 . . . . . 40  
 . . . . . 40  
square, plus ( $\oplus$ )<sup>+</sup> . . . . . 39–41, 55, 56, 59  
two adjacent ( $\omega$ ) . . . . . 42  
vee ( $\vee$ ) . . . . . 43  
vertical line ( $\psi$ ) . . . . . 77
- Uniregistry () . . . . . 315–318  
unit disk ( $\mathbb{D}$ ) . . . . . *see* alphabets, math  
units (package) . . . . . 160  
Unity ()<sup>+</sup> . . . . . 315–319  
unity ( $\mathbb{1}$ ) . . . . . *see* alphabets, math  
universa (package) 195, 257, 387, 388  
universal access () . . . . . 173–175  
universal bunch quantifier ( $\forall^+$ )<sup>+</sup> . . . . . *see* for all  
universal individual quantifier ( $\forall^+$ )<sup>+</sup> . . . . . *see* for all  
university () . . . . . 323–325  
unlink () . . . . . 173–175  
unordered list () . . . . . 173–175  
Unsplash () . . . . . 315–318  
Untappd () . . . . . 315–318  
up bow ( $\vee$ ) . . . . . 214  
UP! () . . . . . 301  
upgreek (package) 20, 121, 387, 388  
upload  
 . . . . . 173–175  
 . . . . . 171–172  
 . . . . . 171–172
- upquote (package) . . . . . 382  
upright Greek letters . . . . . 20, 121  
UPS () . . . . . 315–318  
upside-down letters *see* rotated letters, 22–25, 125, 157  
upside-down symbols . . . . . 368, 381–382  
upsilon  
lowercase ( $\upsilon$ )<sup>+</sup> . . . . . 20, 23, 24, 120, 121  
uppercase ( $\Upsilon$ )<sup>+</sup> . . . . . 20, 120, 121  
Uranus . . . . . 335–338  
 . . . . . 166

- Ⓞ . . . . . 168
  - Ⓟ . . . . . 168
  - Ⓠ . . . . . 166
  - Ⓡ . . . . . 166
  - Ⓢ . . . . . 167
  - url (package) . . . . . 382
  - urwchancal (package) . 162, 163, 387
  - us-Sunnah (☪) . . . . . 315–318
  - USB (🔌) . . . . . 315–318
  - user
    - 👤 . . . . . 308
    - 👤 . . . . . 308
    - 👤 . . . . . 308
    - 👤 . . . . . 308
    - 👤 . . . . . 308
    - add
      - 👤+ . . . . . 308
      - 👤+ . . . . . 308
    - astronaut (🚀) . . . . . 308
    - check (👤) . . . . . 308
    - circled (Ⓢ)<sup>+</sup> . . . . . *see* circled symbols, user
    - clock (🕒) . . . . . 308
    - cog (⚙️) . . . . . 308
    - delete
      - 🗑️ . . . . . 308
      - 🗑️ . . . . . 308
    - edit (👤) . . . . . 308
    - friends (👥) . . . . . 308
    - graduate (🎓) . . . . . 308
    - injured (🚑) . . . . . 308
    - lock (🔒) . . . . . 308
    - medical (🏥) . . . . . 308
    - minus (👤-) . . . . . 308
    - multiple (👥) . . . . . 308
    - multiple, cog (👥⚙️) . . . . . 308
    - multiple, slashed (👥/) . 308
    - ninja (🥷) . . . . . 308
    - nurse (👩) . . . . . 308
    - plus (👤+) . . . . . 308
    - secret (🔒) . . . . . 308
    - shield (🛡️) . . . . . 308
    - slashed (👤/)<sup>+</sup> . . . . . 308
    - tag (👤) . . . . . 308
    - tie (👤) . . . . . 308
    - times (👤\*) . . . . . 308
  - user-interface symbols 171–175
  - ushort (package) . 145, 387, 388
  - USPS (📧) . . . . . 315–318
  - \usym . . . . . 167, 176, 181, 183–185, 187–190, 196, 199, 213, 234–238, 241, 254, 256, 258, 260, 268, 279, 281, 287, 289, 290, 307, 310, 312–314
  - utensils (🍴)<sup>+</sup> . . . . . 321, 323–325
  - UTF-8 . . . . . 385
  - utfsym (package) 167, 176, 181, 183–185, 187–190, 196, 199, 213, 234–238, 241, 254, 256, 258, 260, 268, 279, 281, 287, 289, 290, 307, 310, 312, 314, 387, 388
  - Utopia (font) . . . . . 32, 65
  - uwebo.fd (file) . . . . . 339
- V**
- V (📁) . . . . . 270
  - v
    - v . . . . . 122
    - ∫ . . . . . 25
    - v . . . . . 24
    - v . . . . . 22
    - ring under (v) . . . . . 25
  - Vaadin (🏠) . . . . . 315–318
  - vampire (🧛) . . . . . 291, 301, 304
  - van (🚐) . . . . . 325–327
  - variable-sized symbols . 54–66, 366
  - vector (📏) . . . . . 173–175
  - vector notation . . . . . *see* accents
  - vee (v)<sup>+</sup> . 37, 39–44, 54, 59, 61, 125
    - bar over (v̄)<sup>+</sup> . . . . . 42, 44
    - bar through (v̅)<sup>+</sup> . . . . . 42
    - bar under (v̅)<sup>+</sup> . . . . . 38, 39, 41–44
    - curly (v̇)<sup>+</sup> . 38–43, 54, 55, 58, 59
    - curly, closed (v̈)<sup>+</sup> . . . . . 40
    - curly, dot (v̇)<sup>+</sup> . . . . . 40, 58
    - curly, double (v̈)<sup>+</sup> . 40, 59
    - dot above (v̇)<sup>+</sup> . . . . . 43, 44
    - dot within (v̇)<sup>+</sup> 40, 41, 43, 59
    - double (v̈)<sup>+</sup> . 39–43, 59–61
    - double bar over (v̄̄)<sup>+</sup> . . . . . 43
    - double bar under (v̅̅)<sup>+</sup> 39, 41, 43
    - nested (v̇̇)<sup>+</sup> . . . . . 42, 43
    - slanted bar (v̄) . . . . . 44
    - slanted bar, bar over (v̄̄) 44
    - slanted bar, bar under (v̅) . . . . . 44
    - sloped (v̄) . . . . . 42
    - vertical line through (v̅) 43
  - wedge (w) . . . . . 78
  - vee join (v̅) . . . . . 161
  - vee meet (v̅) . . . . . 161
  - Venus (v)<sup>+</sup> . 166, 168, 335–338
  - vernal (v̄) . . . . . 166
  - versicle (v̄) . . . . . 385, 386
  - vertex (v̄) . . . . . 168
  - vertical bar (|)<sup>+</sup> . . . 19, 22–25, 37, 44, 67, 69, 71, 73, 77, 78, 127, 129, 131–134, 195, 198, 199, 381, 382
  - double (||)<sup>+</sup> 19, 23, 71, 127, 129, 131
  - double, negated (‖)<sup>+</sup> 72, 78
  - equals (≡)<sup>+</sup> . . . . . 23
  - heavy (≡)<sup>+</sup> . . . . . 199
  - negated (≠)<sup>+</sup> 68, 70, 72, 73, 75, 76, 78, 154
  - ring over (̂)<sup>+</sup> . . . . . 77, 117
  - ring over, negated (̂̅) . 117
  - ring under (̅)<sup>+</sup> . . . . . 77, 117
  - ring under, negated (̅̅) 117
  - short (ı)<sup>+</sup> . 40, 68, 73, 76, 77, 195, 211
  - short, dotted (ı̇)<sup>+</sup> . . . . . 40
  - short, negated (ı̅)<sup>+</sup> 68, 72, 75, 76, 78
  - split (|)<sup>+</sup> 34, 170, 211, 253, 383
  - split twice (i) . . . . . 211
  - triple, negated (≡̅) . . . . . 42
  - very high frequency (≈) . . . 164
  - vest (👕) . . . . . 323–325
  - Vesta (👩) . . . . . 168, 335–338
  - Viacoin (👛) . . . . . 32, 315–318
  - Viadeo
    - 👤 . . . . . 315–318
    - 👤 . . . . . 315–318
  - vial (👉) . . . . . 323–325
  - Viber (📞) . . . . . 315–318
  - vibration mode
    - 📞 . . . . . 301
    - 📞 . . . . . 312
  - video camera
    - 📹 . . . . . 173–175
    - 📹 . . . . . 322
    - 📹 . . . . . 301
    - 📹 . . . . . 312
    - slashed (📹) . . . . . 173–175
  - video game controller
    - 🎮 . . . . . 301
    - 🎮 . . . . . 241
  - videocassette
    - 📼 . . . . . 301
    - 📼 . . . . . 312






















































vietnam (package) . . . . . 387  
 viewdata (≡) . . . . . 160  
 vihara (𑖀) . . . . . 310  
 village (🏠🏠) . . . . . 259  
 Vimeo  
   ✔ . . . . . 315–318  
   v . . . . . 315–318  
   ✔ . . . . . 315–318  
   Ⓜ . . . . . 314  
   v . . . . . 314  
 vinculum (≡)+ . *see* accents, bar  
 Vine (🍷) . . . . . 315–318  
 vine (🍷) . . . . . 200  
 Vinogradov notation  
   >+ . . . . . *see* equal,  
     asymptotically  
   >> . . . . . *see* greater than, much  
   << . . . . . *see* less than, much  
 violin  
   🎻 . . . . . 301  
   🎸 . . . . . 313  
 Virgo (♍)+ . . . . . 166–168, 301,  
   335–338  
 virus (🦠) . . . . . 319  
 Visa (🇺🇸) . . . . . 315–318  
 VK (🇻🇰) . . . . . 315–318  
 VLSI symbols . . . . . 357–358  
 vntex (package) . . . . . 21, 26  
 VNV (vuv) . . . . . 315–318  
 voicemail (📞) . . . . . 173–175  
 volcano  
   🌋 . . . . . 301  
   🌋 . . . . . 312  
 volleyball  
   🏐 . . . . . 240  
   🏐 . . . . . 301  
   🏐 . . . . . 241  
 volume control . . . *see* speaker  
 vote yes (🗳️) . . . . . 328–329  
 VS (🇻🇸) . . . . . 301  
 Vue.js (🇻🇯) . . . . . 315–318  
 Vulcan (♃) . . . . . 168

W

W (🇨🇪) . . . . . 270  
 w (w) . . . . . 122  
 waffle (🍩) . . . . . 285  
 wagon (🚲)+ . . . . . 325–327  
 waiting seated (🧑) . . . . . 307  
 walk (🚶) . . . . . 271  
 walking (🚶)+ . . . . . 291, 295, 304,  
   328–329

walking cane (🦯) . . . . . 307  
 wallet (👛) . . . . . 323–325  
 wardrobe (🚪) . . . . . 325–327  
 warehouse (🏢) . . . . . 323–325  
 warning  
   ⚠ . . . . . 284  
   ⚡ . . . . . 311–312  
   ⚠ . . . . . 311–312  
   🚫 . . . . . 311–312  
   ! . . . . . 173–175  
   ! . . . . . 173–175  
   ⚠ . . . . . 171–172  
   ! . . . . . 171–172  
   ! . . . . . 301  
   ⚠ . . . . . 257  
 wastebasket . . . . . *see* trash  
 wasysym (package) . . 25, 32, 35,  
   38, 55, 68, 82, 86, 151, 157,  
   164, 166, 168, 176, 187, 189,  
   192, 212, 253, 365, 367, 387,  
   388  
 watch  
   🕒 . . . . . 261  
   🕒 . . . . . 301  
 Watchman Monitoring (🕒) 315–  
   318  
 water  
   ▽ . . . . . 168  
   ≡ . . . . . 328–329  
   ~ . . . . . 201  
   💧 . . . . . 178  
   non-potable  
     🚫 . . . . . 254  
     🚫 . . . . . 293  
   potable  
     🚰 . . . . . 254  
     🚰 . . . . . 296  
 water buffalo  
   🐃 . . . . . 263  
   🐃 . . . . . 268  
 water closet  
   🚽 . . . . . 301  
   🚽 . . . . . 254  
 water pistol (🔫) . . . . . 301  
 water polo (🏊)+ . . . . . 291, 295, 303  
 watering can (🪴) . . . . . 325–327  
 watermelon  
   🍉 . . . . . 286–287  
   🍉 . . . . . 285  
   🍉 . . . . . 287







waves  
   ≡ . . . . . 328  
   ≡ . . . . . 171–172  
   ≈ . . . . . 171–172  
   🌊 . . . . . 301  
   🌊 . . . . . 312  
 wavy band (〰) . . . . . 200  
 wavy dash (〰) . . . . . 301  
 wavy line delimiters . . 128–132  
 Waze (📍) . . . . . 315–318  
 weak rain (🌧) . . . . . 258  
 weather symbols . . . . 258, 259,  
   311–312  
 Web symbols . . . . . 330–331  
 webomints (package) . . 338, 339,  
   387  
 wedding  
   🎉 . . . . . 302  
   🎉 . . . . . 290  
 wedge (∧)+ . . . . . 37, 39–44, 54, 59,  
   61, 125  
   bar over (⌘)+ . . . . . 38–42, 44  
   bar through (⌘) . . . . . 42  
   bar under (⏟) . . . . . 43  
   circle (⋈)+ . . . . . 43, 66  
   curly (⋈)+ . . . . . 38–43, 54, 55,  
     58, 59  
   curly, closed (⋈) . . . . . 40  
   curly, dot (⋈)+ . . . . . 40, 58  
   curly, double (⋈)+ . . . . . 40, 59  
   dot above (⋈)+ . . . . . 43, 44  
   dot within (⋈)+ . . . . . 40, 41, 43,  
     59, 66  
   double (⋈)+ . . . . . 38–43, 59, 60,  
     62  
   double bar over (⌘)+ . . . . . 38,  
     39, 41, 43  
   double bar under (⏟) . . . . . 43  
   nested (⋈)+ . . . . . 42, 43  
   slanted bar (⋈) . . . . . 44  
   slanted bar, bar over (⌘) 44  
   sloped (∧) . . . . . 42  
   vertical line through (⋈) 43  
 Weebly (🇨🇪) . . . . . 315–318  
 Weibo (🇨🇪) . . . . . 315–318  
 Weierstrass elliptic function (℘)+  
   . . . . . 123, 124  
 weight (🏋) . . . . . 323–325  
 weight lifter (🏋) . . . . . 241  
 Weixin (🇨🇪) . . . . . 315–318  
 whale  
   🐳 . . . . . 263  
   🐳 . . . . . 268

- WhatsApp  
 ..... 315–318  
 ..... 315–318
- wheat (🌾) ..... 206
- wheel of dharma ..... *see*  
 dharmachakra
- wheelbarrow () ..... 325–327
- wheelchair  
 ..... 257  
 ..... 307  
 ..... 320  
 ..... 292  
 ..... 291  
 ..... 302
- white cane (🦯) ..... 302
- white square button  
 ..... 302  
 ..... 313
- whiteboard () *see* chalkboard
- WHMCS (🔧) ..... 315–318
- whole note (🎵)⁺ ..... 215–218  
 dotted (🎵)⁺ ..... 216–218  
 rest (—)⁺ ..... 215, 219  
 rest, dotted (—.) ..... 219
- whole of (€) ..... 368
- why not  
 ? ..... 37  
 ! ..... 161
- Wick contractions ..... 375
- wifi (📶)⁺ *see* wireless network
- Wikipedia (🌐) ..... 315–318
- wind ..... 258  
 ..... 259  
 ..... 259  
 ..... 258
- wind chime  
 ..... 302  
 ..... 313
- window () ..... 302
- window close  
 ..... 173–175  
 ..... 173–175
- window maximize  
 ..... 173–175  
 ..... 173–175
- window minimize  
 — ..... 173–175  
 — ..... 173–175
- window restore  
 ..... 173–175  
 ..... 173–175
- Windows (🖥️) ..... 315–318, 384
- windy cloudy (☁️) ..... 259
- wine  
 ..... 323–325  
 ..... 206  
 ..... 206  
 ..... 206  
 ..... 206  
 ..... 322  
 ..... 285  
 ..... 287
- wireless network  
 ..... 329  
 ..... 171–172  
 ..... 171–172
- witch ..... 52, 150  
 as math-mode accent (⌘)⁺  
 ..... *see* accents, witch on  
 broom  
 math mode (⌘)⁺ ..... 52
- witch’s hat, as math-mode accent  
 ..... 138
- Wix (wix) ..... 315–318
- Wizards of the Coast (🎮) 315–  
 318, 361
- Wodu (wodu) ..... 315–318
- wolf  
 ..... 263  
 ..... 268
- Wolfpack Battalion (🐺) 315–318
- woman  
 ..... 200  
 ..... 323–325  
 ..... 206  
 ..... 302  
 ..... 307  
 adult (👩) ..... 307  
 and man holding hands (👫)  
 ..... 302  
 at drinking fountain (👩) 307  
 at help desk (👩) ..... 307  
 child (👧) ..... 307  
 deaf (👩) ..... 296  
 discarding trash (👩) .. 307  
 getting haircut (👩) ..... 303  
 getting massage (👩) .. 303  
 holding infant (👩) ..... 307  
 in lotus position (👩) .. 303  
 in manual wheelchair (👩) .  
 ..... 303  
 in motorized wheelchair (👩)  
 ..... 303  
 in steamy room (👩) .. 303  
 in tuxedo (👩) ..... 303
- won  
 ..... 32  
 ..... 31
- wood (🌲) ..... 304
- wool (🧶) ..... 206
- word balloon *see* speech bubble
- WordPress  
 ..... 315–318  
 ..... 315–318  
 ..... 318–319
- world ..... *see* globe
- worldflags (package) .. 247–249,  
 283, 387
- worm (🐛) ..... 263
- WPBeginner (👤) ..... 315–318
- WPExplorer (👤) ..... 315–318
- WPForms (📄) ..... 315–318
- WordPress (👤) ..... 315–318
- wreath product (∩)⁺ . 37, 40, 41,  
 43
- wrench  
 ..... 311–312  
 ..... 323–325  
 ..... 322  
 ..... 304  
 ..... 313
- wsuipa (package) 24, 28, 31, 365,  
 368, 373, 374, 387, 388





















wynn (p) . . . . . 23

## X

X () . . . . . 270  
 x-ray () . . . . . 319  
 X11 () . . . . . 318–319  
 Xbox () . . . . . 315–318  
 Xdvi . . . . . 148, 368  
 X<sub>La</sub>T<sub>E</sub>X . . . . . 37, 43,  
 44, 52, 66, 67, 81, 82, 85,  
 91, 111, 114, 115, 120, 125,  
 135, 138, 143, 147, 148, 153,  
 156, 161, 172, 181–183, 185,  
 188, 191, 212, 246, 255, 256,  
 259, 261, 271–275, 307–310,  
 314, 319–322, 327–329, 331,  
 385  
 X<sub>Y</sub>T<sub>E</sub>X . . . . . 30  
 xfakebold (package) . . 380, 387,  
 388  
 xfrac (package) . . . . . 160  
 xi  
 lowercase ( $\xi$ )<sup>+</sup> 20, 120, 121  
 uppercase ( $\Xi$ )<sup>+</sup> 20, 120, 121  
 XING  
 . . . . . 315–318  
 . . . . . 315–318  
 XML . . . . . 384  
 xor  
 $\oplus$  *see* circled symbols, plus  
 $\underline{\vee}$  . . . . *see* vee, bar under  
 X<sub>Y</sub>-pic . . . . . 372








## Y

Y () . . . . . 270  
 down ( $\gamma$ )<sup>+</sup> . . . . 38–40, 42  
 left ( $\leftarrow$ )<sup>+</sup> . . . . 38, 40, 42  
 right ( $\rightarrow$ )<sup>+</sup> . . . . 38–40, 42  
 up ( $\lambda$ )<sup>+</sup> . . . . 38, 40–42, 124  
 y ( $y$ ) . . . . . 122  
 Lidingö/Viby ( $\updownarrow$ ) . . . . 23  
 Y Combinator () . . . 315–318

Yahoo! () . . . . . 315–318  
 Yammer ( $\mathcal{Y}$ ) . . . . . 315–318  
 Yandex () . . . . . 315–318  
 Yandex International ( $\mathcal{Y}$ ) . 315–  
 318  
 Yarn () . . . . . 315–318  
 yarn () . . . . . 304  
 year  
 . . . . . 208–210  
 . . . . . 208–210  
 Yelp () . . . . . 315–318  
 yen  
 $\yen$  . . . . . 160  
 $\mathcal{Y}$  . . . . . 32  
 $\mathcal{Y}$  . . . . . 31, 383  
 yen banknote *see* banknote, yen  
 yfonts (package) . 162, 163, 387,  
 388  
 yhmath (package) 137, 139, 144,  
 153, 373, 387  
 yin-yang  
<sup>+</sup> . . . 257, 284, 290–305,  
 310–312, 339–340  
 . . . . . 304  
 yo-yo  
 . . . . . 325–327  
 . . . . . 304  
 Yeast () . . . . . 315–318  
 yogh ( $\mathfrak{y}$ )<sup>+</sup> . . . . . 23, 25  
 reversed ( $\bar{\mathfrak{y}}$ ) . . . . . 23  
 with bent tail ( $\mathfrak{y}$ ) . . . . 23  
 with curly tail ( $\mathfrak{y}$ )<sup>+</sup> . 23, 25  
 yoke ( $\mathcal{Y}$ ) . . . . . 259  
 YouTube  
 . . . . . 315–318  
 . . . . . 315–318  
 . . . . . 314  
 . . . . . 314  
 Yu, Billy . . . . . 374

## Z

Z () . . . . . 270

z  
 round ( $\mathfrak{z}$ ) . . . . . 25  
 Z notation  
 domain antirestriction ( $\triangleleft$ )  
*see* triangle, bar through  
 range antirestriction ( $\triangleright$ ) .  
*see* triangle, bar through  
 relational composition ( $\mathfrak{z}$ )<sup>+</sup>  
*see* semicolon, hollow  
 relational image ( $((\mathfrak{z}))$ )<sup>+</sup> *see*  
 delimiters, parenthesis with  
 bar  
 schema piping ( $\gg$ )<sup>+</sup> . . *see*  
 greater than, much  
 schema projection ( $\uparrow$ )<sup>+</sup> *see*  
 restriction  
 spot ( $\bullet$ )<sup>+</sup> . . . . . *see* bullet  
 type colon ( $\mathfrak{z}$ ) . *see* colon,  
 hollow  
 Zapf Chancery (font) . . . . . 163  
 Zapf Dingbats (font) . 179, 189  
 zebra  
 . . . . . 264–267  
 . . . . . 263  
 Zenodo ()<sup>+</sup> . . . . . 330–331  
 zeta  
 lowercase ( $\zeta$ )<sup>+</sup> 20, 120, 121  
 uppercase ( $Z$ )<sup>+</sup> . . 20, 120  
 Zeus ( $\mathfrak{Z}$ ) . . . . . 168  
 Zhihu ( $\mathfrak{Z}$ ) . . . . . 315–318  
 zigzag  
 horizontal ( $\sim$ ) . . . . . 159  
 vertical ( $\mathfrak{z}$ ) . . . . . 160  
 zodiac symbols . . . . . 166–168,  
 335–338  
 zombie ()<sup>+</sup> . . . . . 291, 304  
 zoom ()<sup>+</sup> . . . . . 171–172  
 zoom in ( $\mathfrak{z}$ )<sup>+</sup> . . . . . 171–172  
 zoom out ( $\mathfrak{z}$ )<sup>+</sup> . . . . . 171–172  
 Zotero  
 . . . . . 330–331  
 . . . . . 330–331  
 zzz ( $\mathfrak{z}$ ) . . . . . 304