

The Comprehensive L^AT_EX Symbol List

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Abstract

This document lists 14283 symbols and the corresponding L^AT_EX commands that produce them. Some of these symbols are guaranteed to be available in every L^AT_EX 2 _{ε} 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 T_EX Archive Network (<http://www.ctan.org/>).

Contents

Contents	1
1 Introduction	12
1.1 Document Usage	12
1.2 Frequently Requested Symbols	12
2 Body-text symbols	14
Table 1: L ^A T _E X 2 _{ε} Escapable “Special” Characters	14
Table 2: Predefined L ^A T _E X 2 _{ε} Text-mode Commands	14
Table 3: L ^A T _E X 2 _{ε} Commands Defined to Work in Both Math and Text Mode	15
Table 4: <i>AMS</i> Commands Defined to Work in Both Math and Text Mode	15
Table 5: Non-ASCII Letters (Excluding Accented Letters)	15
Table 6: <i>textgreek</i> Upright Greek Letters	16
Table 7: Letters Used to Typeset African Languages	16
Table 8: Letters Used to Typeset Vietnamese	16
Table 9: Punctuation Marks Not Found in OT1	17
Table 10: <i>pifont</i> Decorative Punctuation Marks	17
Table 11: <i>tipa</i> Phonetic Symbols	17
Table 12: <i>tipx</i> Phonetic Symbols	18
Table 13: <i>wsuipa</i> Phonetic Symbols	19
Table 14: <i>wasysym</i> Phonetic Symbols	20
Table 15: <i>phonetic</i> Phonetic Symbols	20
Table 16: <i>t4phonet</i> Phonetic Symbols	20
Table 17: <i>semtrans</i> Transliteration Symbols	20
Table 18: Text-mode Accents	21
Table 19: <i>tipa</i> Text-mode Accents	21
Table 20: <i>extraipa</i> Text-mode Accents	23
Table 21: <i>wsuipa</i> Text-mode Accents	23
Table 22: <i>phonetic</i> Text-mode Accents	23
Table 23: <i>metre</i> Text-mode Accents	24

^{*}The original version of this document was written by David Carlisle, with several additional tables provided by Alexander Holt. See Section 10.8 on page 246 for more information about who did what.

Table 24:	t4phonet Text-mode Accents	24
Table 25:	arcs Text-mode Accents	24
Table 26:	semtrans Accents	24
Table 27:	ogonek Accents	24
Table 28:	combelow Accents	25
Table 29:	wsuipa Diacritics	25
Table 30:	textcomp Diacritics	25
Table 31:	marvosym Diacritics	25
Table 32:	textcomp Currency Symbols	26
Table 33:	marvosym Currency Symbols	26
Table 34:	fontawesome Currency Symbols	26
Table 35:	wasysym Currency Symbols	26
Table 36:	GfNA2e Currency Symbols	26
Table 37:	teubner Currency Symbols	27
Table 38:	tfrupee Currency Symbols	27
Table 39:	eurosym Euro Signs	27
Table 40:	fourier Euro Signs	27
Table 41:	textcomp Legal Symbols	27
Table 42:	fontawesome Legal Symbols	27
Table 43:	cclicenses Creative Commons License Icons	28
Table 44:	ccicons Creative Commons License Icons	28
Table 45:	textcomp Old-style Numerals	28
Table 46:	Miscellaneous textcomp Symbols	28
Table 47:	Miscellaneous wasysym Text-mode Symbols	28
3	Mathematical symbols	30
Table 48:	Math-Mode Versions of Text Symbols	30
Table 49:	cml Unary Operators	30
Table 50:	Binary Operators	31
Table 51:	<i>AMS</i> Binary Operators	31
Table 52:	stmaryrd Binary Operators	32
Table 53:	wasysym Binary Operators	32
Table 54:	txfonts/pxfonts Binary Operators	32
Table 55:	mathabx Binary Operators	33
Table 56:	MnSymbol Binary Operators	33
Table 57:	fdsymbol Binary Operators	34
Table 58:	boisik Binary Operators	35
Table 59:	stix Binary Operators	36
Table 60:	mathdesign Binary Operators	37
Table 61:	cml Binary Operators	37
Table 62:	shuffle Binary Operators	37
Table 63:	ulsy Geometric Binary Operators	37
Table 64:	mathabx Geometric Binary Operators	37
Table 65:	MnSymbol Geometric Binary Operators	38
Table 66:	fdsymbol Geometric Binary Operators	38
Table 67:	boisik Geometric Binary Operators	39
Table 68:	stix Geometric Binary Operators	40
Table 69:	halloweenmath Halloween-Themed Math Operators	40
Table 70:	stix Small Integrals	41
Table 71:	stix Small Integrals with Explicit Slant	41
Table 72:	Variable-sized Math Operators	42
Table 73:	<i>AMS</i> Variable-sized Math Operators	42
Table 74:	stmaryrd Variable-sized Math Operators	42
Table 75:	wasysym Variable-sized Math Operators	43

Table 76:	mathabx Variable-sized Math Operators	43
Table 77:	txfonts/pxfonts Variable-sized Math Operators	44
Table 78:	esint Variable-sized Math Operators	45
Table 79:	bigints Variable-sized Math Operators	46
Table 80:	MnSymbol Variable-sized Math Operators	46
Table 81:	fdsymbol Variable-sized Math Operators	47
Table 82:	boisik Variable-sized Math Operators	48
Table 83:	stix Variable-sized Math Operators	48
Table 84:	stix Integrals with Explicit Slant	50
Table 85:	mathdesign Variable-sized Math Operators	51
Table 86:	prodint Variable-sized Math Operators	52
Table 87:	cml Large Math Operators	52
Table 88:	Binary Relations	52
Table 89:	<i>AMS</i> Binary Relations	52
Table 90:	<i>AMS</i> Negated Binary Relations	53
Table 91:	stmaryrd Binary Relations	53
Table 92:	wasysym Binary Relations	53
Table 93:	txfonts/pxfonts Binary Relations	53
Table 94:	txfonts/pxfonts Negated Binary Relations	54
Table 95:	mathabx Binary Relations	54
Table 96:	mathabx Negated Binary Relations	54
Table 97:	MnSymbol Binary Relations	55
Table 98:	MnSymbol Negated Binary Relations	56
Table 99:	fdsymbol Binary Relations	57
Table 100:	fdsymbol Negated Binary Relations	59
Table 101:	boisik Binary Relations	60
Table 102:	boisik Negated Binary Relations	60
Table 103:	stix Binary Relations	61
Table 104:	stix Negated Binary Relations	62
Table 105:	mathtools Binary Relations	62
Table 106:	turnstile Binary Relations	63
Table 107:	trsym Binary Relations	64
Table 108:	trfsigns Binary Relations	64
Table 109:	cml Binary Relations	64
Table 110:	colonequals Binary Relations	64
Table 111:	fourier Binary Relations	64
Table 112:	Subset and Superset Relations	64
Table 113:	<i>AMS</i> Subset and Superset Relations	65
Table 114:	stmaryrd Subset and Superset Relations	65
Table 115:	wasysym Subset and Superset Relations	65
Table 116:	txfonts/pxfonts Subset and Superset Relations	65
Table 117:	mathabx Subset and Superset Relations	65
Table 118:	MnSymbol Subset and Superset Relations	66
Table 119:	fdsymbol Subset and Superset Relations	66
Table 120:	boisik Subset and Superset Relations	66
Table 121:	stix Subset and Superset Relations	67
Table 122:	Inequalities	67
Table 123:	<i>AMS</i> Inequalities	67
Table 124:	wasysym Inequalities	68
Table 125:	txfonts/pxfonts Inequalities	68
Table 126:	mathabx Inequalities	68
Table 127:	MnSymbol Inequalities	69
Table 128:	fdsymbol Inequalities	70
Table 129:	boisik Inequalities	71

Table 130:	stix Inequalities	71
Table 131:	<i>AMS</i> Triangle Relations	72
Table 132:	stmaryrd Triangle Relations	72
Table 133:	mathabx Triangle Relations	73
Table 134:	MnSymbol Triangle Relations	73
Table 135:	fdsymbol Triangle Relations	74
Table 136:	boisik Triangle Relations	74
Table 137:	stix Triangle Relations	74
Table 138:	Arrows	75
Table 139:	Harpoons	75
Table 140:	textcomp Text-mode Arrows	75
Table 141:	<i>AMS</i> Arrows	75
Table 142:	<i>AMS</i> Negated Arrows	75
Table 143:	<i>AMS</i> Harpoons	76
Table 144:	stmaryrd Arrows	76
Table 145:	txfonts/pfxfonts Arrows	76
Table 146:	mathabx Arrows	76
Table 147:	mathabx Negated Arrows	76
Table 148:	mathabx Harpoons	77
Table 149:	MnSymbol Arrows	77
Table 150:	MnSymbol Negated Arrows	79
Table 151:	MnSymbol Harpoons	80
Table 152:	MnSymbol Negated Harpoons	81
Table 153:	fdsymbol Arrows	81
Table 154:	fdsymbol Negated Arrows	83
Table 155:	fdsymbol Harpoons	85
Table 156:	fdsymbol Negated Harpoons	85
Table 157:	boisik Arrows	86
Table 158:	boisik Negated Arrows	87
Table 159:	boisik Harpoons	87
Table 160:	stix Arrows	87
Table 161:	stix Negated Arrows	90
Table 162:	stix Harpoons	90
Table 163:	harpoon Extensible Harpoons	91
Table 164:	chemarrow Arrows	91
Table 165:	fge Arrows	91
Table 166:	old-arrows Arrows	92
Table 167:	old-arrows Harpoons	92
Table 168:	esrelation Restrictions	92
Table 169:	MnSymbol Spoons	93
Table 170:	MnSymbol Pitchforks	93
Table 171:	MnSymbol Smiles and Frowns	94
Table 172:	fdsymbol Spoons	94
Table 173:	fdsymbol Pitchforks	95
Table 174:	fdsymbol Smiles and Frowns	95
Table 175:	ulsy Contradiction Symbols	95
Table 176:	Extension Characters	95
Table 177:	stmaryrd Extension Characters	95
Table 178:	txfonts/pfxfonts Extension Characters	95
Table 179:	mathabx Extension Characters	95
Table 180:	stix Extension Characters	96
Table 181:	Log-like Symbols	96
Table 182:	<i>AMS</i> Log-like Symbols	96
Table 183:	GfNA2e Number Sets	96

Table 184: Greek Letters	97
Table 185: <i>AMS</i> Greek Letters	97
Table 186: txfonts/pxfonts Upright Greek Letters	98
Table 187: upgreek Upright Greek Letters	98
Table 188: fourier Variant Greek Letters	98
Table 189: txfonts/pxfonts Variant Latin Letters	99
Table 190: boisik Variant Greek Letters	99
Table 191: boisik Variant Latin Letters	99
Table 192: stix Variant Greek Letters	99
Table 193: stix Transformed Greek Letters	99
Table 194: <i>AMS</i> Hebrew Letters	99
Table 195: MnSymbol Hebrew Letters	99
Table 196: fdsymbol Hebrew Letters	99
Table 197: boisik Hebrew Letters	100
Table 198: stix Hebrew Letters	100
Table 199: Letter-like Symbols	100
Table 200: <i>AMS</i> Letter-like Symbols	100
Table 201: txfonts/pxfonts Letter-like Symbols	100
Table 202: mathabx Letter-like Symbols	100
Table 203: MnSymbol Letter-like Symbols	100
Table 204: fdsymbol Letter-like Symbols	101
Table 205: boisik Letter-like Symbols	101
Table 206: stix Letter-like Symbols	101
Table 207: trfsigns Letter-like Symbols	101
Table 208: mathdesign Letter-like Symbols	101
Table 209: fge Letter-like Symbols	102
Table 210: fourier Letter-like Symbols	102
Table 211: cmlt Letter-like Symbols	102
Table 212: <i>AMS</i> Delimiters	102
Table 213: stmaryrd Delimiters	102
Table 214: mathabx Delimiters	102
Table 215: boisik Delimiters	102
Table 216: stix Delimiters	103
Table 217: nath Delimiters	103
Table 218: Variable-sized Delimiters	103
Table 219: Large, Variable-sized Delimiters	104
Table 220: <i>AMS</i> Variable-sized Delimiters	104
Table 221: stmaryrd Variable-sized Delimiters	104
Table 222: mathabx Variable-sized Delimiters	104
Table 223: MnSymbol Variable-sized Delimiters	105
Table 224: fdsymbol Variable-sized Delimiters	106
Table 225: stix Variable-sized Delimiters	107
Table 226: mathdesign Variable-sized Delimiters	108
Table 227: nath Variable-sized Delimiters (Double)	109
Table 228: nath Variable-sized Delimiters (Triple)	109
Table 229: fourier Variable-sized Delimiters	109
Table 230: textcomp Text-mode Delimiters	110
Table 231: metre Text-mode Delimiters	110
Table 232: Math-mode Accents	110
Table 233: <i>AMS</i> Math-mode Accents	110
Table 234: MnSymbol Math-mode Accents	111
Table 235: fdsymbol Math-mode Accents	111
Table 236: boisik Math-mode Accents	111
Table 237: stix Math-mode Accents	111

Table 238: fge Math-mode Accents	111
Table 239: yhmath Math-mode Accents	112
Table 240: Extensible Accents	112
Table 241: overrightarrow Extensible Accents	112
Table 242: yhmath Extensible Accents	113
Table 243: <i>AMS</i> Extensible Accents	113
Table 244: MnSymbol Extensible Accents	113
Table 245: fdsymbol Extensible Accents	113
Table 246: stix Extensible Accents	114
Table 247: mathtools Extensible Accents	114
Table 248: mathabx Extensible Accents	114
Table 249: fourier Extensible Accents	115
Table 250: esvect Extensible Accents	115
Table 251: abraces Extensible Accents	115
Table 252: undertilde Extensible Accents	115
Table 253: ushort Extensible Accents	116
Table 254: mdwmath Extensible Accents	116
Table 255: actuarialangle Extensible Accents	116
Table 256: <i>AMS</i> Extensible Arrows	116
Table 257: mathtools Extensible Arrows	116
Table 258: chemarr Extensible Arrows	116
Table 259: chemarrow Extensible Arrows	117
Table 260: extarrows Extensible Arrows	117
Table 261: extpfeil Extensible Arrows	117
Table 262: DotArrow Extensible Arrows	117
Table 263: halloweenmath Extensible Arrows	118
Table 264: trfsigns Extensible Transform Symbols	118
Table 265: esrelation Extensible Relations	118
Table 266: halloweenmath Extensible Witches	118
Table 267: halloweenmath Extensible Ghosts	118
Table 268: holtpolt Non-commutative Division Symbols	119
Table 269: Dots	119
Table 270: <i>AMS</i> Dots	119
Table 271: wasysym Dots	119
Table 272: MnSymbol Dots	120
Table 273: fdsymbol Dots	120
Table 274: stix Dots	120
Table 275: mathdots Dots	120
Table 276: yhmath Dots	121
Table 277: teubner Dots	121
Table 278: begriff Begriffsschrift Symbols	121
Table 279: frege Begriffsschrift Symbols	121
Table 280: mathcomp Math Symbols	121
Table 281: marvosym Math Symbols	122
Table 282: marvosym Digits	122
Table 283: fge Digits	122
Table 284: dozenal Base-12 Digits	122
Table 285: mathabx Mayan Digits	122
Table 286: stix Infinities	122
Table 287: stix Primes	122
Table 288: stix Empty Sets	123
Table 289: <i>AMS</i> Angles	123
Table 290: MnSymbol Angles	123
Table 291: fdsymbol Angles	123

Table 292: <i>boisik</i> Angles	123
Table 293: <i>stix</i> Angles	123
Table 294: Miscellaneous L ^A T _E X 2 _{<} Math Symbols	124
Table 295: Miscellaneous <i>AMS</i> Math Symbols	124
Table 296: Miscellaneous <i>wasysym</i> Math Symbols	124
Table 297: Miscellaneous <i>txfonts/pxfonts</i> Math Symbols	124
Table 298: Miscellaneous <i>mathabx</i> Math Symbols	124
Table 299: Miscellaneous <i>MnSymbol</i> Math Symbols	125
Table 300: Miscellaneous Internal <i>MnSymbol</i> Math Symbols	125
Table 301: Miscellaneous <i>fdsymbol</i> Math Symbols	125
Table 302: Miscellaneous <i>boisik</i> Math Symbols	125
Table 303: Miscellaneous <i>stix</i> Math Symbols	126
Table 304: Miscellaneous <i>textcomp</i> Text-mode Math Symbols	126
Table 305: Miscellaneous <i>fge</i> Math Symbols	126
Table 306: Miscellaneous <i>mathdesign</i> Math Symbols	127
Table 307: Math Alphabets	128
4 Science and technology symbols	130
Table 308: <i>gensymb</i> Symbols Defined to Work in Both Math and Text Mode	130
Table 309: <i>wasysym</i> Electrical and Physical Symbols	130
Table 310: <i>ifsym</i> Pulse Diagram Symbols	130
Table 311: <i>ar</i> Aspect Ratio Symbol	130
Table 312: <i>textcomp</i> Text-mode Science and Engineering Symbols	130
Table 313: <i>steinmetz</i> Extensible Phasor Symbol	131
Table 314: <i>emf</i> Electromotive Force Symbols	131
Table 315: <i>wasysym</i> Astronomical Symbols	131
Table 316: <i>marvosym</i> Astronomical Symbols	132
Table 317: <i>fontawesome</i> Astronomical Symbols	132
Table 318: <i>mathabx</i> Astronomical Symbols	132
Table 319: <i>stix</i> Astronomical Symbols	132
Table 320: <i>starfont</i> Astronomical Symbols	133
Table 321: <i>wasysym</i> APL Symbols	133
Table 322: <i>stix</i> APL Symbols	134
Table 323: <i>apl</i> APL Symbols	134
Table 324: <i>marvosym</i> Computer Hardware Symbols	134
Table 325: <i>keystroke</i> Computer Keys	134
Table 326: <i>ascii</i> Control Characters (CP437)	135
Table 327: <i>logic</i> Logic Gates	135
Table 328: <i>marvosym</i> Communication Symbols	136
Table 329: <i>marvosym</i> Engineering Symbols	136
Table 330: <i>wasysym</i> Biological Symbols	136
Table 331: <i>stix</i> Biological Symbols	136
Table 332: <i>marvosym</i> Biological Symbols	136
Table 333: <i>fontawesome</i> Biological Symbols	136
Table 334: <i>marvosym</i> Safety-related Symbols	136
Table 335: <i>feyn</i> Feynman Diagram Symbols	137
Table 336: <i>svrsymbols</i> Physics Ideograms	137
5 Dingbats	139
Table 337: <i>bding</i> Arrows	139
Table 338: <i>pifont</i> Arrows	139
Table 339: <i>adfsymbols</i> Arrows	140
Table 340: <i>adforn</i> Arrows	140
Table 341: <i>arev</i> Arrows	140

Table 342: fontawesome Arrows	140
Table 343: fontawesome Chevrons	141
Table 344: marvosym Scissors	141
Table 345: bbdng Scissors	141
Table 346: pifont Scissors	141
Table 347: dingbat Pencils	141
Table 348: arev Pencils	141
Table 349: fontawesome Pencils	141
Table 350: bbdng Pencils and Nibs	141
Table 351: pifont Pencils and Nibs	142
Table 352: dingbat Fists	142
Table 353: bbdng Fists	142
Table 354: pifont Fists	142
Table 355: fourier Fists	142
Table 356: arev Fists	142
Table 357: fontawesome Fists	142
Table 358: bbdng Crosses and Plusxes	143
Table 359: pifont Crosses and Plusxes	143
Table 360: adfsymbols Crosses and Plusxes	143
Table 361: arev Crosses	143
Table 362: bbdng Xs and Check Marks	143
Table 363: pifont Xs and Check Marks	143
Table 364: wasysym Xs and Check Marks	143
Table 365: marvosym Xs and Check Marks	143
Table 366: arev Xs and Check Marks	144
Table 367: fontawesome Xs and Check Marks	144
Table 368: pifont Circled Numerals	144
Table 369: wasysym Stars	144
Table 370: bbdng Stars, Flowers, and Similar Shapes	145
Table 371: pifont Stars, Flowers, and Similar Shapes	145
Table 372: adfsymbols Stars, Flowers, and Similar Shapes	145
Table 373: adforn Stars	145
Table 374: fontawesome Stars	146
Table 375: fourier Fleurons and Flowers	146
Table 376: adforn Fleurons and Flowers	146
Table 377: wasysym Geometric Shapes	146
Table 378: MnSymbol Geometric Shapes	147
Table 379: fdsymbol Geometric Shapes	147
Table 380: boisik Geometric Shapes	147
Table 381: stix Geometric Shapes	148
Table 382: ifsym Geometric Shapes	149
Table 383: bbdng Geometric Shapes	150
Table 384: pifont Geometric Shapes	150
Table 385: universa Geometric Shapes	150
Table 386: adfsymbols Geometric Shapes	150
Table 387: fontawesome Geometric Shapes	151
Table 388: L ^A T _E X 2 _{&} Playing-Card Suits	151
Table 389: txfonts/pxfonts Playing-Card Suits	151
Table 390: MnSymbol Playing-Card Suits	151
Table 391: fdsymbol Playing-Card Suits	151
Table 392: boisik Playing-Card Suits	151
Table 393: stix Playing-Card Suits	151
Table 394: arev Playing-Card Suits	151
Table 395: adforn Flourishes	152

Table 396: Miscellaneous dingbat Dingbats	152
Table 397: Miscellaneous bbding Dingbats	152
Table 398: Miscellaneous pifont Dingbats	152
Table 399: Miscellaneous adforn Dingbats	152
6 Ancient languages	153
Table 400: phaistos Symbols from the Phaistos Disk	153
Table 401: protosem Proto-Semitic Characters	153
Table 402: hieroglf Hieroglyphics	154
Table 403: linearA Linear A Script	154
Table 404: linearb Linear B Basic and Optional Letters	157
Table 405: linearb Linear B Numerals	157
Table 406: linearb Linear B Weights and Measures	157
Table 407: linearb Linear B Ideograms	158
Table 408: linearb Unidentified Linear B Symbols	158
Table 409: cypriot Cypriot Letters	158
Table 410: sarabian South Arabian Letters	159
Table 411: teubner Archaic Greek Letters and Greek Numerals	159
Table 412: boisik Archaic Greek Letters and Greek Numerals	159
Table 413: epiolmec Epi-Olmec Script	160
Table 414: epiolmec Epi-Olmec Numerals	161
Table 415: allrunes Runes	162
Table 416: allrunes Rune Separators	162
7 Musical symbols	163
Table 417: <i>L^AT_EX 2_{&}</i> Musical Symbols	163
Table 418: textcomp Musical Symbols	163
Table 419: wasysym Musical Symbols	163
Table 420: MnSymbol Musical Symbols	163
Table 421: fdsymbol Musical Symbols	163
Table 422: boisik Musical Symbols	163
Table 423: stix Musical Symbols	163
Table 424: arev Musical Symbols	163
Table 425: MusiXT _E X Musical Symbols	164
Table 426: MusiXT _E X Alternative Clefs	165
Table 427: harmony Musical Symbols	165
Table 428: harmony Musical Accents	165
Table 429: <i>lilylypbs</i> Single Notes	166
Table 430: <i>lilylypbs</i> Beamed Notes	167
Table 431: <i>lilylypbs</i> Clefs	167
Table 432: <i>lilylypbs</i> Time Signatures	167
Table 433: <i>lilylypbs</i> Accidentals	167
Table 434: <i>lilylypbs</i> Rests	168
Table 435: <i>lilylypbs</i> Dynamics Letters	168
Table 436: <i>lilylypbs</i> Dynamics Symbols	168
Table 437: <i>lilylypbs</i> Articulations	168
Table 438: <i>lilylypbs</i> Scripts	168
Table 439: <i>lilylypbs</i> Accordion Notation	168
Table 440: <i>lilylypbs</i> Named Time Signatures	169
Table 441: <i>lilylypbs</i> Named Scripts	169

Table 442: <i>lilylypbs</i> Named Rests	170
Table 443: <i>lilylypbs</i> Named Pedals	170
Table 444: <i>lilylypbs</i> Named Flags	171
Table 445: <i>lilylypbs</i> Named Custodes	171
Table 446: <i>lilylypbs</i> Named Clefs	172
Table 447: <i>lilylypbs</i> Named Noteheads	173
Table 448: <i>lilylypbs</i> Named Accordion Symbols	178
Table 449: <i>lilylypbs</i> Named Accidentals	178
Table 450: <i>lilylypbs</i> Named Arrowheads	179
Table 451: <i>lilylypbs</i> Named Alphanumerics and Punctuation	179
Table 452: Miscellaneous <i>lilylypbs</i> Named Musical Symbols	180
8 Other symbols	181
Table 453: <i>textcomp</i> Genealogical Symbols	181
Table 454: <i>wasysym</i> General Symbols	181
Table 455: <i>manfnt</i> Dangerous Bend Symbols	181
Table 456: Miscellaneous <i>manfnt</i> Symbols	181
Table 457: <i>marvosym</i> Media Control Symbols	182
Table 458: <i>marvosym</i> Laundry Symbols	182
Table 459: <i>marvosym</i> Information Symbols	182
Table 460: Other <i>marvosym</i> Symbols	182
Table 461: Miscellaneous <i>universa</i> Symbols	182
Table 462: Miscellaneous <i>fourier</i> Symbols	182
Table 463: <i>ifsym</i> Weather Symbols	183
Table 464: <i>ifsym</i> Alpine Symbols	183
Table 465: <i>ifsym</i> Clocks	183
Table 466: Other <i>ifsym</i> Symbols	183
Table 467: <i>clock</i> Clocks	184
Table 468: <i>epsdice</i> Dice	184
Table 469: <i>hhcount</i> Dice	184
Table 470: <i>stix</i> Dice	184
Table 471: <i>bullcntr</i> Tally Markers	185
Table 472: <i>hhcount</i> Tally Markers	185
Table 473: <i>dozenal</i> Tally Markers	185
Table 474: <i>skull</i> Symbols	186
Table 475: Non-Mathematical <i>mathabx</i> Symbols	186
Table 476: <i>skak</i> Chess Informator Symbols	186
Table 477: <i>skak</i> Chess Pieces and Chessboard Squares	187
Table 478: <i>igo</i> Go Symbols	187
Table 479: <i>go</i> Go Symbols	188
Table 480: <i>metre</i> Metrical Symbols	188
Table 481: <i>metre</i> Small and Large Metrical Symbols	188
Table 482: <i>teubner</i> Metrical Symbols	189
Table 483: <i>dictsym</i> Dictionary Symbols	189
Table 484: <i>simpsons</i> Characters from <i>The Simpsons</i>	189
Table 485: <i>pmboxdraw</i> Box-Drawing Symbols	190
Table 486: <i>staves</i> Magical Staves	190
Table 487: <i>pigpen</i> Cipher Symbols	191
Table 488: <i>GfNA2e</i> Phases of the Moon	191
Table 489: <i>GfNA2e</i> Recycling Symbols	192
Table 490: <i>marvosym</i> Recycling Symbols	192

Table 491: recycle Recycling Symbols	192
Table 492: Other GIMP2e Symbols	192
Table 493: soyombo Soyombo Symbols	193
Table 494: knitting Knitting Symbols	193
Table 495: CountriesOfEurope Country Maps	194
Table 496: Miscellaneous arev Symbols	196
Table 497: cookingsymbols Cooking Symbols	196
Table 498: tikzsymbols Cooking Symbols	196
Table 499: tikzsymbols Emoticons	196
Table 500: tikzsymbols 3D Emoticons	197
Table 501: tikzsymbols Trees	197
Table 502: Miscellaneous tikzsymbols Symbols	197
Table 503: Miscellaneous bclogo Symbols	197
Table 504: fontawesome Web-Related Icons	199
Table 505: rubikcube Rubik's Cube Rotations	203
9 Fonts with minimal L^AT_EX support	204
Table 506: hands Fists	204
Table 507: greenpoint Recycling Symbols	204
Table 508: nkarta Map Symbols	204
Table 509: moonphase Astronomical Symbols	206
Table 510: astrosym Astronomical Symbols	206
Table 511: webomints Decorative Borders	209
Table 512: umranda Decorative Borders	210
Table 513: umrandb Decorative Borders	211
Table 514: dingbat Decorative Borders	213
Table 515: knot Celtic Knots	213
Table 516: dancers Dancing Men	217
Table 517: semaphor Semaphore Alphabet	220
Table 518: cryst Crystallography Symbols	222
Table 519: dice Dice	223
Table 520: magic Trading Card Symbols	224
Table 521: bartel-chess-fonts Chess Pieces and Chessboard Squares	224
10 Additional Information	226
10.1 Symbol Name Clashes	226
10.2 Resizing symbols	226
10.3 Where can I find the symbol for ...?	229
10.4 Math-mode spacing	239
10.5 Bold mathematical symbols	240
10.6 ASCII and Latin 1 quick reference	240
10.7 Unicode characters	244
10.8 About this document	246
10.9 Copyright and license	248
References	249
Index	250

1 Introduction

Welcome to the Comprehensive L^AT_EX Symbol List! This document strives to be your primary source of L^AT_EX symbol information: font samples, L^AT_EX commands, packages, usage details, caveats—everything needed to put 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_EX Archive Network (<http://www.ctan.org/>).
2. All of their symbols have L^AT_EX 2_E 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^AT_EX Symbol List, that second restriction has been relaxed with the inclusion of Section 9, which showcases fonts that provide, at a minimum, either T_EX font-metric files (`.tfm`) or the METAFONT sources (`.mf`) that produce those font-metric files. Some of the Section 9 fonts do include L^AT_EX font-definition files (`.fd`). However, what sets the fonts in Section 9 apart from the fonts in rest of the document is that they lack a L^AT_EX style file (`.sty`) that individually names each of the glyphs.

The restrictions listed above are not particularly limiting criteria; the Comprehensive L^AT_EX Symbol List contains samples of 14283 symbols—quite a large number. Some of these symbols are guaranteed to be available in every L^AT_EX 2_E system; others require fonts and packages that may not accompany a given distribution and that therefore need to be installed. See <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=instpackages+wherefiles> for help with installing new fonts and packages.

1.1 Document Usage

Each section of this document contains a number of font tables. Each table shows a set of symbols, with the corresponding L^AT_EX 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 45, “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 Section 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^AT_EX) 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`”.

Section 10 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^AT_EX ASCII and Latin 1 tables, shows how to input and output Unicode characters, and provides some information about this document itself. The Comprehensive L^AT_EX Symbol List ends with an index of all the symbols in the document and various additional useful terms.

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.

„, as in “Spaces_are_significant.”	14	©, ®, and ™	27
ı, ī, ĩ, ĩ, ĩ, etc. (versus ī, ī, ĩ, ĩ, and ĩ)	21	%o	28
¢	26	ƒ	44
€	26	⋮	52

\coloneqq and \coloneqq	53	$\mathbb{N}, \mathbb{Z}, \mathbb{R}$, etc.	128
\lesssim and \gtrsim	67	\varkappa	128
\therefore	120	f	232
$^\circ$, as in “180 $^\circ$ ” or “15 $^\circ$ C”	126	\acute{a}, \grave{e} , etc. (i.e., several accents per character)	234
\mathcal{L}, \mathcal{F} , etc.	128	$<, >$, and $ $ (instead of \downarrow , \uparrow , and \dashv)	242
		\wedge and \sim (or \sim)	242

2 Body-text symbols

This section 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

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

* 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 $\text{\LaTeX} 2\epsilon$ Text-mode Commands

^	<code>\textasciicircum*</code>	<	<code>\textless</code>
~	<code>\textasciitilde*</code>	a	<code>\textordfeminine</code>
*	<code>\textasteriskcentered</code>	o	<code>\textordmasculine</code>
\	<code>\textbackslash</code>	\P	<code>\textparagraph†</code>
	<code>\textbar</code>	.	<code>\textperiodcentered</code>
	<code>\textbardbl</code>	%oo	<code>\textpertenthousand</code>
○	<code>\textbigcircle</code>	%o	<code>\textperthousand</code>
{	<code>\textbraceleft†</code>	¿	<code>\textquestiondown</code>
}	<code>\textbraceright†</code>	“	<code>\textquotedblleft</code>
•	<code>\textbullet</code>	”	<code>\textquotedblright</code>
©	<code>\textcopyright†</code>	‘	<code>\textquotelleft</code>
†	<code>\textdagger†</code>	,	<code>\textquoteright</code>
‡	<code>\textdaggerdbl†</code>	(R)	<code>\textregistered</code>
\$	<code>\textdollar†</code>	§	<code>\textsection†</code>
...	<code>\textellipsis†</code>	£	<code>\textsterling†</code>
—	<code>\textemdash</code>	TM	<code>\texttrademark</code>
—	<code>\textendash</code>	-	<code>\textunderscore†</code>
i	<code>\textexclamdown</code>	—	<code>\textvisible</code>
>	<code>\textgreater</code>		

The first symbol column represents the—sometimes “faked”—symbol that $\text{\LaTeX} 2\epsilon$ 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 242.

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

TABLE 3: L^AT_EX 2 _{ε} Commands Defined to Work in Both Math and Text Mode

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

The first symbol column represents the—sometimes “faked”—symbol that L^AT_EX 2 _{ε} 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: *AMS* Commands Defined to Work in Both Math and Text Mode

✓	\checkmark	®	\circledR	✗	\maltese
---	------------	---	-----------	---	----------

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

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

* 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>	\circ	<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>	O	<code>\textOmicron</code>	Φ	<code>\textPhi</code>
Δ	<code>\textDelta</code>	K	<code>\textKappa</code>	Π	<code>\textPi</code>	X	<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 187 on page 98), `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 `poltonikogreek`) option—and, of course, a font that provides the glyphs for the Greek alphabet.

TABLE 7: Letters Used to Typeset African Languages

D	<code>\B{D}</code>	đ	<code>\m{c}</code>	f	<code>\m{f}</code>	ķ	<code>\m{k}</code>	t	<code>\M{t}</code>	ڇ	<code>\m{Z}</code>
đ	<code>\B{d}</code>	D	<code>\m{D}</code>	F	<code>\m{F}</code>	ڏ	<code>\m{N}</code>	T	<code>\M{T}</code>	ڦ	<code>\T{E}</code>
H	<code>\B{H}</code>	ڏ	<code>\M{d}</code>	ڙ	<code>\m{G}</code>	ڻ	<code>\m{n}</code>	ڻ	<code>\m{t}</code>	ڦ	<code>\T{e}</code>
ڻ	<code>\B{h}</code>	D	<code>\M{D}</code>	ڙ	<code>\m{g}</code>	ڻ	<code>\m{o}</code>	T	<code>\m{T}</code>	ڦ	<code>\T{O}</code>
t	<code>\B{t}</code>	ڏ	<code>\m{d}</code>	ڻ	<code>\m{i}</code>	ڻ	<code>\m{o}</code>	ڻ	<code>\m{u}</code> *	ڻ	<code>\T{o}</code>
T	<code>\B{T}</code>	ڦ	<code>\m{E}</code>	ڻ	<code>\m{i}</code>	ڦ	<code>\m{P}</code>	ڻ	<code>\m{U}</code> *		
ڻ	<code>\m{b}</code>	ڦ	<code>\m{e}</code>	N	<code>\m{J}</code>	ڦ	<code>\m{p}</code>	ڦ	<code>\m{Y}</code>		
ڦ	<code>\m{B}</code>	ڦ	<code>\M{E}</code>	n	<code>\m{j}</code>	ڦ	<code>\m{s}</code>	ڦ	<code>\m{y}</code>		
C	<code>\m{C}</code>	ڦ	<code>\M{e}</code>	K	<code>\m{K}</code>	ڦ	<code>\m{s}</code>	ڦ	<code>\m{z}</code>		

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

Ӧ `\OHORN` Ӧ `\ohorn` Ӧ `\UHORN` Ӧ `\uhorn`

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

TABLE 9: Punctuation Marks Not Found in OT1

```
< \guillemotleft < \guilsinglleft „ \quotedblbase " \textquotedbl
» \guillemotright > \guilsinglright , \quotesinglbase
```

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: tipa Phonetic Symbols

؂	\textbabymu	ؒ	\textglotstop	ؑ	\textrtailn
؃	\textbarb	؄	\texthalflength	؅	\textrtailr
؄	\textbarc	؆	\texthardsign	؇	\textrtails
؅	\textbard	؈	\texthooktop	؉	\textrtailt
؊	\textbardotlessj	؋	\texthtb	،	\textrtailz
؋	\textbarg	،	\texthtbardotlessj	؍	\textrthook
،	\textbarglotstop	؎	\texthtc	؏	\textsca
؎	\textbari	ؐ	\texthtd	ؐ	\textscb
؏	\textbarl	ؑ	\texthtg	ؑ	\textscce
ؐ	\textbaro	ؔ	\textthh	ؔ	\textscg
ؔ	\textbarrevglotstop	ؕ	\textthheng	ؕ	\textsch
ؕ	\textbaru	ؖ	\texthtk	ؖ	\textschwa
ؖ	\textbeltl	ؗ	\texthtp	ؗ	\textsci
ؗ	\textbeta	ؘ	\texthtq	ؘ	\textscj
ؘ	\textbullseye	ؙ	\texthtrtaild	ؙ	\textsccl
ؙ	\textceltpal	ؚ	\texthtscg	ؚ	\textscn
ؚ	\textchi	؛	\texthtt	؛	\textscelig
؛	\textcloseepsilon	؜	\texthvlig	؜	\textscomega
؜	\textcloseomega	؝	\textinvglotstop	؝	\textscr
؝	\textcloserepsilon	؞	\textinvscr	؞	\textscripta
؞	\textcommatailz	؟	\textiota	؟	\textscriptg
؟	\textcorner	ؠ	\textlambda	ؠ	\textscriptv
ؠ	\textcrb	آ	\textlengthmark	آ	\textscu
آ	\textcrd	أ	\textlhookt	أ	\textscy
أ	\textcrg	ؤ	\textlhtlongi	ؤ	\textsecstress
ؤ	\textcrh	إ	\textlhtlongy	إ	\textsoftsign
إ	\textcrinvglotstop	ئ	\textlonglegr	ئ	\textstretchc
ئ	\textcrlambda	ب	\textlptr	ب	\texttctclig
ب	\textcrttwo	ة	\textltailm	ة	\textteshlig
ة	\textctc	ت	\textltailn	ت	\texttheta

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đ	\textctd	ѣ	\textltilde	þ	\textthorn
ǳ	\textctdctzlig	Ѣ	\textlyoghlig	׀	\texttoneletterstem
Ѡ	\textctesh	Ѩ	\textObardotlessj	Ծ	\texttslig
ӂ	\textctj	Ӄ	\textOlyoghlig	Ӧ	\textturna
ѿ	\textctn	Ӯ	\textomega	Ӱ	\textturncelig
Ӯ	\textctt	ӻ	\textopencorner	ӻ	\textturnh
Ӯ	\textctctclig	Ӽ	\textopeno	ӻ	\textturnk
Ӯ	\textctyogh	ӽ	\textpalhook	ӻ	\textturnlonglegr
Ӯ	\textctcz	ӽ	\textphi	ӻ	\textturnnm
Ӯ	\textdctzlig	ӽ	\textpipe	ӻ	\textturnmrleg
Ӯ	\textdoublebaresh	ӽ	\textprimstress	ӻ	\textturnr
Ӯ	\textdoublebarpipe	ӽ	\textraiseglotstop	ӻ	\textturnrrtail
Ӯ	\textdoublebarslash	ӽ	\textraisevibyi	ӻ	\textturnscripta
Ӯ	\textdoublepipe	ӽ	\textramshorns	ӻ	\textturnrt
Ӯ	\textdoublevertline	ӽ	\textrevapostrophe	ӻ	\textturnv
Ӯ	\textdownstep	ӽ	\textreve	ӻ	\textturnw
Ӯ	\textdyoghlig	ӽ	\textrevepsilon	ӻ	\textturny
Ӯ	\textdzlig	ӽ	\textrevglotstop	ӻ	\textupsilon
Ӯ	\textepsilon	ӽ	\textrevyogh	ӽ	\textupstep
Ӯ	\textesh	ӽ	\textrhookrevesilon	ӽ	\textvertline
Ӯ	\textfishhookr	ӽ	\textrhookschwa	ӽ	\textvibyi
Ӯ	\textg	ӽ	\textrhoticity	ӽ	\textvibyy
Ӯ	\textgamma	ӽ	\textrptr	ӽ	\textwynn
Ӯ	\textglobfall	ӽ	\textrtaild	ӽ	\textyogh
Ӯ	\textglobrise	ӽ	\textrtaill		

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

TABLE 12: tipx Phonetic Symbols

ѡ	\textaolig	ժ	\texthtbarlessjvar	ւ	\textrthooklong
ܶ	\textbentailyogh	ܵ	\textinvomega	ܵ	\textscalpha
ܷ	\textbktailgamma	ܵ	\textinvscalpha	ܵ	\textscdelta
ܸ	\textctinvglotstop	ܵ	\textinvscripta	ܵ	\textscf
ܹ	\textctjvar	ܵ	\textlfishhookrlig	ܵ	\textscck
ܺ	\textctstetchc	ܵ	\textlhookfour	ܵ	\textscm
ܻ	\textctstetchcvar	ܵ	\textlhookp	ܵ	\textscp
ܻ	\textctturnt	ܵ	\textlhti	ܵ	\textscq
ܻ	\textdblig	ܵ	\textlooptoprevesh	ܵ	\textscleftarrow
ܻ	\textdoublebarpipevar	ܵ	\textnrleg	ܵ	\textstetchcvar
ܻ	\textdoublepipevar	ܵ	\textObullseye	ܵ	\textsubdoublearrow

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↓	\textdownfullarrow	↓	\textpalhooklong	→	\textsubrightarrow
♀	\textfemale	♂	\textpalhookvar	þ	\textthornvari
n	\textfrbarn		\textpipevar	þ	\textthornvari
đ	\textfrhookd	đ	\textqplig	þ	\textthornvari
đ	\textfrhookdvar	đ	\textrectangle	þ	\textthornvari
t	\textfrhookt	¬	\textretractingvar	đ	\textturnglotstop
γ	\textfrtailgamma	✉	\textrevscl	✉	\textturnsck
?	\textglotstopvari	✉	\textrevscr	✉	\textturnscu
?	\textglotstopvari	✉	\textrhooka	✉	\textturnthree
?	\textglotstopvari	✉	\textrhooke	✉	\textturntwo
γ	\textgrgamma	✉	\textrhookepsilon	✉	\textuncrfemale
ḥ	\textheng	✉	\textrhookopeno	↑	\textupfullarrow
hm	\texthmlig	✉	\textrtailhth		

TABLE 13: wsipa Phonetic Symbols

ȝ	\babygamma	ȝ	\eng	ȝ	\labdentalnas	ə	\schwa
b	\barb	ð	\er	ɸ	\latfric	I	\sci
d	\bard	f	\esh	ƿ	\legm	N	\scn
i	\bari	ð	\eth	r	\legr	R	\scr
t	\barl	r	\flapr	ȝ	\lz	a	\scripta
ə	\baro	?	\glotstop	ɑ	\nialpha	g	\scriptg
p	\barp	β	\hookb	β	\nibeta	v	\scriptv
ť	\barsci	đ	\hookd	χ	\nichi	U	\scu
ւ	\barscu	ȝ	\hookg	ɛ	\niepsilon	Y	\scy
ս	\baru	fi	\hookh	γ	\nigamma	þ	\slashb
⌚	\clickb	ڻ	\hookheng	ι	\niota	ڦ	\slashc
Ҫ	\clickc	ȝ	\hookrevepsilon	λ	\nilambda	ڏ	\slashd
ȝ	\clickt	hv		ω	\niomega	ڙ	\slashu
ࡠ	\closedniomega	e	\inva	ϕ	\niph	ڏ	\taild
ࡢ	\closedrevepsilon	j	\invf	σ	\nisigma	ڥ	\tailinvr
ࡡ	\crossb	ጀ	\invglotstop	θ	\nitheta	ڦ	\taill
ࡢ	\crossd	ጀ	\invvh	ʊ	\niupsilon	ڻ	\tailn
ࡣ	\crossh	ጀ	\invlegr	ڻ	\nj	ڦ	\tailr
ࡥ	\crossnilambda	ጀ	\invvm	ڦ	\oo	s	\tails
ࡦ	\curlyc	ጀ	\invr	ɔ	\openo	t	\tailt
ࡨ	\curlyesh	ጀ	\invscr	ə	\reve	z	\tailz
ࡧ	\curlyyogh	ጀ	\invscrip	ڦ	\reveject	ڦ	\tesh
ࡪ	\curlyz	ጀ	\invv	ڦ	\revepsilon	þ	\thorn
ࡤ	\dlbari	ጀ	\invw	ڦ	\revglotstop	ڦ	\tildel
ࡩ	\dz	ጀ	\invy	D	\scd	ڦ	\yogh
ࡪ	\ejective	ጀ	\ipagamma	G	\scg		

TABLE 14: `wasysym` Phonetic Symbols

D	\DH	ð	\dh	ɔ	\openo
P	\Thorn	ø	\inve	þ	\thorn

TABLE 15: `phonetic` Phonetic Symbols

j	\barj	r	\flap	i	\ibar	v	\rotvara	ı	\vari
λ	\barlambda	ʔ	\glottal	ɔ	\openo	ɯ	\rotw	օ	\varomega
ŋ	\emgma	B	\hausaB	ħ	\planck	ʌ	\roty	ɔ	\varopeno
ŋ	\engma	b	\hausab	ʌ	\pwedge	ə	\schwa	v	\vod
n	\enya	d	\hausad	D	\revD	þ	\thorn	fi	\voicedh
ɛ	\epsi	D	\hausaD	ɾ	\riota	ɯ	\ubar	ʒ	\yogh
ʃ	\esh	ɸ	\hausak	w	\rotm	ɥ	\udesc		
ð	\eth	K	\hausaK	ʊ	\rotOmega	a	\vara		
fj	\fj	d	\hookd	ɹ	\rotr	g	\varg		

TABLE 16: `t4phonet` Phonetic Symbols

đ	\textcrd	d̪	\texthtd		\textpipe
ħ	\textcrh	ɸ	\texthtk	ɖ	\textrtaild
ε	\textepsilon	ɸ̪	\texthtp	ʈ	\textrtailt
ʃ	\textesh	t̪	\texthtt	ɖ̪	\textschwa
fj	\textfjlig	ɾ	\textiota	ʃ̪	\textscriptv
b	\texthtb	n̪	\textltailn	ʈ̪	\textteshlig
ɛ	\texthtc	ɔ̪	\textopeno	ʒ̪	\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 page 16) but using the same names as the `tipa` characters presented in Table 11 on page 17.

TABLE 17: `semtrans` Transliteration Symbols

› \Alif ‘ \Ayn

TABLE 18: Text-mode Accents

$\ddot{A}a$	$\\"{}{A}\\"{}{a}$	$\dot{A}a$	$\\"{}{A}\\"{}{a}^\dagger$	$\hat{A}a$	$\\"{}{f}{A}\\"{}{f}{a}^\P$	$\widehat{A}a$	$\\"{}{t}{A}\\"{}{t}{a}$
$\acute{A}a$	$\\"{}{A}\\"{}{a}$	$\tilde{A}a$	$\\"{}{A}\\"{}{a}$	$\ddot{A}a$	$\\"{}{G}{A}\\"{}{G}{a}^\ddag$	$\check{A}a$	$\\"{}{u}{A}\\"{}{u}{a}$
$\grave{A}a$	$\\"{}{A}\\"{}{a}$	$\underline{A}a$	$\\"{}{b}{A}\\"{}{b}{a}$	$\acute{A}a$	$\\"{}{h}{A}\\"{}{h}{a}^\S$	$\ddot{A}a$	$\\"{}{U}{A}\\"{}{U}{a}^\ddag$
$\bar{A}a$	$\\"{}={A}\\"{}={a}$	$\underline{A}a$	$\\"{}{c}{A}\\"{}{c}{a}$	$\acute{A}a$	$\\"{}{H}{A}\\"{}{H}{a}$	$\check{A}a$	$\\"{}{U}{A}\\"{}{U}{a}^\P$
$\hat{A}a$	$\\"{}^{\wedge}{A}\\"{}^{\wedge}{a}$	$\tilde{A}a$	$\\"{}{C}{A}\\"{}{C}{a}^\P$	$\acute{A}a$	$\\"{}{k}{A}\\"{}{k}{a}^\dagger$	$\check{A}a$	$\\"{}{v}{A}\\"{}{v}{a}$
$\grave{A}a$	$\\"{}^{\prime}{A}\\"{}^{\prime}{a}$	$\underline{A}a$	$\\"{}{d}{A}\\"{}{d}{a}$	$\acute{A}a$	$\\"{}{r}{A}\\"{}{r}{a}$		
		$\widehat{A}a$	$\\"{}{newtie}{A}\\"{}{newtie}{a}^*$	$\textcircled{A}a$	$\\"{}{textcircled}{A}\\"{}{textcircled}{a}$		

* Requires the `textcomp` package.

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

‡ Requires the T4 font encoding, provided by the `fc` package.

§ Requires the T5 font encoding, provided by the `vntex` package.

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

Also note the existence of `\i` and `\j`, which produce dotless versions of “i” and “j” (viz., “i” and “j”). 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^AT_EX. Font encodings other than OT1 and newer versions of L^AT_EX properly typeset “na`\\"{}{i}ve`” as “naïve”.

TABLE 19: `tipa` Text-mode Accents

$\acute{A}a$	$\\"{}{textacutemacron}{A}\\"{}{textacutemacron}{a}$
$\acute{\AA}a$	$\\"{}{textacuteewedge}{A}\\"{}{textacuteewedge}{a}$
$\dot{A}a$	$\\"{}{textadvancing}{A}\\"{}{textadvancing}{a}$
$\underline{A}a$	$\\"{}{textbottomtiebar}{A}\\"{}{textbottomtiebar}{a}$
$\breve{A}a$	$\\"{}{textbrevemacron}{A}\\"{}{textbrevemacron}{a}$
$\breve{\AA}a$	$\\"{}{textcircumacute}{A}\\"{}{textcircumacute}{a}$
$\hat{A}a$	$\\"{}{textcircumdot}{A}\\"{}{textcircumdot}{a}$
$\acute{\AA}a$	$\\"{}{textdotacute}{A}\\"{}{textdotacute}{a}$
$\breve{\AA}a$	$\\"{}{textdotbreve}{A}\\"{}{textdotbreve}{a}$
$\ddot{A}a$	$\\"{}{textdoublegrave}{A}\\"{}{textdoublegrave}{a}$
$\ddot{\AA}a$	$\\"{}{textdoublebaraccent}{A}\\"{}{textdoublebaraccent}{a}$

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Ãœ \textfallrise{A}\textfallrise{a}
Ãœ \textgravecircum{A}\textgravecircum{a}
Ãœ \textgravedot{A}\textgravedot{a}
Ãœ \textgravemacron{A}\textgravemacron{a}
Ãœ \textgravemid{A}\textgravemid{a}
Ãœ \texthighrise{A}\texthighrise{a}
Ãœ \textinvsubbridge{A}\textinvsubbridge{a}
Ãœ \textlowering{A}\textlowering{a}
Ãœ \textlowrise{A}\textlowrise{a}
Ãœ \textmidacute{A}\textmidacute{a}
Ãœ \textovercross{A}\textovercross{a}
Ãœ \textoverw{A}\textoverw{a}
Ãœ \textpolhook{A}\textpolhook{a}
Ãœ \textraising{A}\textraising{a}
Ãœ \textretracting{A}\textretracting{a}
Ãœ \textringmacron{A}\textringmacron{a}
Ãœ \textrisefall{A}\textrisefall{a}
Ãœ \textroundcap{A}\textroundcap{a}
Ãœ \textseagull{A}\textseagull{a}
Ãœ \textsubacute{A}\textsubacute{a}
Ãœ \textsubarch{A}\textsubarch{a}
Ãœ \textsubbar{A}\textsubbar{a}
Ãœ \textsubbridge{A}\textsubbridge{a}
Ãœ \textsubcircum{A}\textsubcircum{a}
Ãœ \textsubdot{A}\textsubdot{a}
Ãœ \textsubgrave{A}\textsubgrave{a}
Ãœ \textsublhalfring{A}\textsublhalfring{a}
Ãœ \textsubplus{A}\textsubplus{a}
Ãœ \textsubrhalfring{A}\textsubrhalfring{a}
Ãœ \textsubring{A}\textsubring{a}
Ãœ \textsubsquare{A}\textsubsquare{a}
Ãœ \textsubtilde{A}\textsubtilde{a}
Ãœ \textsubumlaut{A}\textsubumlaut{a}
Ãœ \textsubw{A}\textsubw{a}
Ãœ \textsubwedge{A}\textsubwedge{a}
Ãœ \textsuperimpostilde{A}\textsuperimpostilde{a}
Ãœ \textsyllabic{A}\textsyllabic{a}
Ãœ \texttildedot{A}\texttildedot{a}
Ãœ \texttoptiebar{A}\texttoptiebar{a}

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`\` \textvbaraccent{A} \textvbaraccent{a}`

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

TABLE 20: extraipa Text-mode Accents

<code>\` \bibridge{A} \bibridge{a}</code>	<code>\` \partvoiceless{A} \partvoiceless{a}</code>
<code>\` \crttilde{A} \crttilde{a}</code>	<code>\` \sliding{A} \sliding{a}</code>
<code>\` \dottedtilde{A} \dottedtilde{a}</code>	<code>\` \spreadlips{A} \spreadlips{a}</code>
<code>\` \doubletilde{A} \doubletilde{a}</code>	<code>\` \subcorner{A} \subcorner{a}</code>
<code>\` \finpartvoice{A} \finpartvoice{a}</code>	<code>\` \subdoublebar{A} \subdoublebar{a}</code>
<code>\` \finpartvoiceless{A} \finpartvoiceless{a}</code>	<code>\` \subdoublevert{A} \subdoublevert{a}</code>
<code>\` \inipartvoice{A} \inipartvoice{a}</code>	<code>\` \sublptr{A} \sublptr{a}</code>
<code>\` \inipartvoiceless{A} \inipartvoiceless{a}</code>	<code>\` \subrptr{A} \subrptr{a}</code>
<code>\` \overbridge{A} \overbridge{a}</code>	<code>\` \whistle{A} \whistle{a}</code>
<code>\` \partvoice{A} \partvoice{a}</code>	

TABLE 21: wsuipa Text-mode Accents

<code>\` \ dental{A} \dental{a}</code>
<code>\` \ underarch{A} \underarch{a}</code>

TABLE 22: phonetic Text-mode Accents

<code>\` \ hill{A} \hill{a}</code>	<code>\` \ rc{A} \rc{a}</code>	<code>\` \ ut{A} \ut{a}</code>
<code>\` \ od{A} \od{a}</code>	<code>\` \ syl{A} \syl{a}</code>	
<code>\` \ ohill{A} \ohill{a}</code>	<code>\` \ tdf{A} \tdf{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 “á” and `\acarc{\\"}{e}` produces “ë”. `\labvel` joins two characters with an arc: `\labvel{mn}` → “m̄n”. `\upbar` is intended to go between characters as in “x\upbar{y}” → “x̄y”. Lastly, `\uplett` behaves like `\textsuperscript` but uses a smaller font. Contrast “p\uplett{h}” → “p^h” with “ph” → “p^h”.

TABLE 23: metre Text-mode Accents

Áá	\acutus{A}\acutus{a}
Ăă	\breve{A}\breve{a}
Ãã	\circumflexus{A}\circumflexus{a}
Äää	\diaeresis{A}\diaeresis{a}
Àà	\gravis{A}\gravis{a}
Āā	\macron{A}\macron{a}

TABLE 24: t4phonet Text-mode Accents

Äää	\textdoublegrave{A}\textdoublegrave{a}
Áå	\textvbaraccent{A}\textvbaraccent{a}
Ãä	\textdoublevbaraccent{A}\textdoublevbaraccent{a}

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 “†” in Table 18 on page 21) but using the same names as the `tipa` accents presented in Table 19 on page 21.

TABLE 25: `arcs` Text-mode Accents

Āā	\overarc{A}\overarc{a}	Āā	\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_ET_EX mailing list (Subject: “The arcs package”, dated 2013/08/25) to prevent spurious text from being added to the document (as in, “5.0ptĀ” when “Ā” is expected).

TABLE 26: `semtrans` Accents

Āā	\D{A}\D{a}	Āā	\U{A}\U{a}
Āā		\T{A}\T{a}*	

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

TABLE 27: `ogonek` Accents

Āā	\k{A}\k{a}
----	------------

TABLE 28: `combelow` Accents

`\Aa` `\cb{A}\cb{a}`

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

TABLE 29: `w sui pa` Diacritics

‘	<code>\ain</code>	‘	<code>\leftp</code>	°	<code>\overring</code>	’	<code>\stress</code>	˘	<code>\underwedge</code>
˘	<code>\corner</code>	˘	<code>\leftt</code>	˘	<code>\polishhook</code>	˘	<code>\syllabic</code>	^	<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>	˘	<code>\secstress</code>	˘	<code>\undertilde</code>		

The `w sui pa` 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 “å”, and `\diaunder[\underdots|a]` produces “ä”. See the `w sui pa` documentation for more information.

TABLE 30: `textcomp` Diacritics

”	<code>\textacutedbl</code>	˘	<code>\textasciicaron</code>	˘	<code>\textasciimacron</code>
˘	<code>\textasciiacute</code>	˘	<code>\textasciidieresis</code>	˘	<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 233 for more information.

TABLE 31: `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 233 for more information.

TABLE 32: `textcomp` Currency Symbols

\textbaht	$\$$	\textdollar^*	\textguarani	\textwon
\textcent	$\$$	$\text{\textdollaroldstyle}$	\textlira	\textyen
\textcentoldstyle	\textdollar	\textdong	\textnaira	
$\text{\textcolonmonetary}$	\texteuro		\textpeso	
\textcurrency	f	\textflorin	\textsterling^*	

* It's generally preferable to use the corresponding symbol from Table 3 on page 15 because the symbols in that table work properly in both text mode and math mode.

TABLE 33: `marvosym` Currency Symbols

\Denarius	\EURcr	\EURtm	\Pfund
\Ecommerce	\EURdig	\EyesDollar	\Shilling
\EUR	\EURhv	\Florin	

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 282 (`\EURdig`). The `mathdesign` package redefines `\texteuro` to be visually compatible with one of three additional fonts: `Utopia` (\texteuro), `Charter` (\texteuro), or `Garamond` (\texteuro).

TABLE 34: `fontawesome` Currency Symbols

\faBtc	\faIlS	\faKrw	\faUsd
\faEur	\faInr	\faRub	\faViacoin
\faGbp	\faJpy	\faTry	

`fontawesome` defines `\faBitcoin` as a synonym for `\faBtc`; `\faCny`, `\faYen`, and `\faRmb` as synonyms for `\faJpy`; `\faDollar` as a synonym for `\faUsd`; `\faEuro` as a synonym for `\faEur`; `\faRouble` and `\faRuble` as synonyms for `\faRub`; `\faRupee` as a synonym for `\faInr`; `\faShekel` and `\faSheqel` as synonyms for `\faIlS`; `\faTurkishLira` as a synonym for `\faTry`; and `\faWon` as a synonym for `\faKrw`.

TABLE 35: `wasysym` Currency Symbols

\cent	\currency
----------------	--------------------

TABLE 36: `GNOME` Currency Symbols

\Euro	\Pound
----------------	-----------------

TABLE 37: teubner Currency Symbols

\times	<code>\denarius</code>	\circ	<code>\hemiobelion</code>	\circlearrowleft	<code>\tetartemorion</code>
\vdash	<code>\dracma</code>	\circlearrowright	<code>\stater</code>		

TABLE 38: tfrupee Currency Symbols

₹ `\rupee`

TABLE 39: eurosym Euro Signs

€ `\geneuro` € `\geneuronarrow` € `\geneurowide` € `\official euro`

`\euro` is automatically mapped to one of the above—by default, `\official euro`—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 40: fourier Euro Signs

€ `\eurologo` € `\textteuro`

TABLE 41: textcomp Legal Symbols

\textcircled{P}	<code>\textcircledP</code>	\textcircled{C}	<code>\textcopyright</code>	$\textcircled{S}\text{M}$	<code>\textservicemark</code>
\textcircled{R}	<code>\textcopyleft</code>	\textcircled{R}	<code>\textregistered</code>	$\textcircled{T}\text{M}$	<code>\texttrademark</code>

The first symbol column represents the—sometimes “faked”—symbol that L^AT_EX 2_E provides by default. The second symbol column represents the symbol as redefined by `textcomp`. The `textcomp` package is generally required to typeset Table 41’s symbols in italic.

See <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=tradesyms> for solutions to common problems that occur when using these symbols (e.g., getting a “(r)” when you expected to get a “(R)”).

TABLE 42: fontawesome Legal Symbols

\textcircled{C}	<code>\faCopyright</code>	\textcircled{R}	<code>\faRegistered</code>
\textcircled{C}	<code>\faCreativeCommons</code>	$\textcircled{T}\text{M}$	<code>\faTrademark</code>

TABLE 43: *cclicenses* Creative Commons License Icons

	\cc		\ccnc*		\ccsa*
	\ccbby		\ccnd		

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

TABLE 44: *ccicons* Creative Commons License Icons

	\ccAttribution		\ccNonCommercialEU		\ccShare
	\ccCopy		\ccNonCommercialJP		\ccShareAlike
	\ccLogo		\ccPublicDomain		\ccZero
	\ccNoDerivatives		\ccRemix		
	\ccNonCommercial		\ccSampling		

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 45: *textcomp* Old-style Numerals

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

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

TABLE 46: Miscellaneous *textcomp* Symbols

b	\textblank	¶	\textpilcrow
	\textbrokenbar	'	\textquotesingle
=	\textdblhyphen	,	\textquotestraightbase
=	\textdblhyphenchar	"	\textquotestraightdblbase
%	\textdiscount	R	\textrecipe
E	\textestimated	*	\textreferencemark
†	\textinterrobang	—	\textthreequartersemdash
‡	\textinterrobangdown	~	\texttildelow
№	\textnumero	—	\texttwelveudash
º	\textopenbullet		

TABLE 47: Miscellaneous *wasysym* Text-mode Symbols

%%	\permil
----	---------

3 Mathematical symbols

Most, but not all, of the symbols in this section 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 307 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 “ \dashv ” (`\blitza`), “ $\Rightarrow\Leftarrow$ ” (`\Rightarrow\Leftarrow`), “ \perp ” (`\bot`), “ \leftrightarrow ” (`\nleftrightarrows`), and “ \bowtie ” (`\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*¹), and “ $\stackrel{\text{def}}{=}$ ” (`\stackrel{\text{def}}{=}`). See also the example of `\equalsfill` on page 235. Depending upon the context, disjoint union may be represented as “ \coprod ”, “ \sqcup ” (`\sqcup`), “ \dotcup ” (`\dotcup`), “ \oplus ” (`\oplus`), or any of a number of other symbols.² 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 “ $\mathcal{O}x$ ” or “ $\mathcal{D}x$ ” (`\mathcal{O}x` or `\mathcal{D}x`). The moral of the story is that you should be careful always to explain your notation to avoid confusing your readers.

TABLE 48: Math-Mode Versions of Text Symbols

<code>\$</code>	<code>\mathdollar</code>	<code>\P</code>	<code>\mathparagraph</code>	<code>\£</code>	<code>\mathsterling</code>
<code>...</code>	<code>\mathellipsis</code>	<code>\S</code>	<code>\mathsection</code>	<code>-</code>	<code>\mathunderscore</code>

It’s generally preferable to use the corresponding symbol from Table 3 on page 15 because the symbols in that table work properly in both text mode and math mode.

TABLE 49: cml|| Unary Operators

<code>!</code>	<code>\oc*</code>	<code>\uparrow</code>	<code>\shneg</code>	<code>?</code>	<code>\wn*</code>
<code>\ddot{}</code>	<code>\shift</code>	<code>\downarrow</code>	<code>\shpos</code>		

* `\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 “ $A = !B$ ”.

¹In `txfonts`, `pxfonts`, and `mathtools` the symbol is called `\coloneqqq`. In `mathabx` and `MnSymbol` it’s called `\coloneqq`. In `colonequals` it’s called `\colonequals`.

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

TABLE 50: Binary Operators

II	\amalg	U	\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 L^AT_EX 2_ε core. Use the `latexsym` package to expose this symbol.

TABLE 51: *AMS* Binary Operators

⊸	\barwedge	◎	\circledcirc	⊤	\intercal*
⊻	\boxdot	⊖	\circleddash	⊸	\leftthreetimes
⊻	\boxminus	⊼	\Cup	⊸	\ltimes
⊻	\boxplus	⊽	\curlyvee	⊸	\rightthreetimes
⊻	\boxtimes	⊶	\curlywedge	⊸	\rtimes
⊸	\Cap	⊛	\divideontimes	⊸	\smallsetminus
·	\centerdot	⊕	\dotplus	⊸	\veebar
⊛	\circledast	⊸	\doublebarwedge		

* Some people use a superscripted `\intercal` for matrix transpose: “ A^{\intercal} ” \mapsto “ A^\intercal ”. (See the May 2009 `comp.text.tex` thread, “raising math symbols”, for suggestions about altering the height of the superscript.) `\top` (Table 199 on page 100), `T`, and `\mathsf{T}` are other popular choices: “ A^\top ”, “ A^T ”, “ A^T ”.

TABLE 52: `stmaryrd` Binary Operators

ϕ	<code>\baro</code>	\parallel	<code>\interleave</code>	\otimes	<code>\varoast</code>
$\backslash\!\backslash$	<code>\bbslash</code>	\lhd	<code>\leftslice</code>	\odot	<code>\varobar</code>
$\&$	<code>\binampersand</code>	$\wedge\!\wedge$	<code>\merge</code>	\oslash	<code>\varobslash</code>
\wp	<code>\bindnasrepma</code>	\ominus	<code>\minuso</code>	$\odot\odot$	<code>\varocircle</code>
\blacksquare	<code>\boxast</code>	\pm	<code>\moo</code>	$\odot\odot$	<code>\varodot</code>
\blacksquare	<code>\boxbar</code>	\oplus	<code>\nplus</code>	$\oslash\oslash$	<code>\varogreaterthan</code>
\blacksquare	<code>\boxbox</code>	\circledcirc	<code>\obar</code>	$\oslash\oslash$	<code>\varolessthan</code>
\blacksquare	<code>\boxbslash</code>	\square	<code>\oblong</code>	$\ominus\ominus$	<code>\varominus</code>
\blacksquare	<code>\boxcircle</code>	$\oslash\oslash$	<code>\obslash</code>	$\oplus\oplus$	<code>\varoplus</code>
\blacksquare	<code>\boxdot</code>	$\oslash\oslash$	<code>\ogreaterthan</code>	$\oslash\oslash$	<code>\varoslash</code>
\blacksquare	<code>\boxempty</code>	$\oslash\oslash$	<code>\olessthan</code>	$\otimes\otimes$	<code>\varotimes</code>
\blacksquare	<code>\boxslash</code>	$\oslash\oslash$	<code>\ovee</code>	$\oslash\oslash$	<code>\varovee</code>
\Downarrow	<code>\curlyveedownarrow</code>	\circledcirc	<code>\owedge</code>	$\oslash\oslash$	<code>\varowedge</code>
\Uparrow	<code>\curlyveeuparrow</code>	\triangleright	<code>\rightslice</code>	$\times\mathbb{X}$	<code>\vartimes</code>
\nwarrow	<code>\curlywedgedownarrow</code>	$//$	<code>\sslash</code>	$\gamma\mathbb{Y}$	<code>\Ydown</code>
\nearrow	<code>\curlywedgeuparrow</code>	\square	<code>\talloblong</code>	$\prec\mathbb{L}$	<code>\Yleft</code>
$\backslash\!\backslash$	<code>\fatbslash</code>	\circledcirc	<code>\varbigcirc</code>	$\succ\mathbb{R}$	<code>\Yright</code>
\circ	<code>\fatsemi</code>	$\gamma\mathbb{Y}$	<code>\varcurlyvee</code>	$\prec\mathbb{L}$	<code>\Yup</code>
$\blacksquare/\!$	<code>\fatslash</code>	$\prec\mathbb{L}$	<code>\varcurlywedge</code>		

TABLE 53: `wasysym` Binary Operators

\lhd	<code>\lhd</code>	\circ	<code>\ocircle</code>	\rhd	<code>\RHD</code>	\rhd	<code>\unrhd</code>
\blacktriangleleft	<code>\LHD</code>	\triangleright	<code>\rhd</code>	\trianglelefteq	<code>\unlhd</code>		

TABLE 54: `txfonts/pxfonts` Binary Operators

\circledcirc	<code>\circledbar</code>	\circledcirc	<code>\circledwedge</code>	\circ	<code>\medcirc</code>
\circledcirc	<code>\circledbslash</code>	\wp	<code>\invamp</code>	\blacksquare	<code>\sqcapplus</code>
\circledcirc	<code>\circledvee</code>	\bullet	<code>\medbullet</code>	\blacksquare	<code>\sqcupplus</code>

TABLE 55: mathabx Binary Operators

*	\ast	∧	\curlywedge	□	\sqcap
*	\Asterisk	÷	\divdot	□	\sqcup
⊓	\barwedge	※	\divideontimes	⊑	\sqdoublecap
★	\bigstar	÷	\dotdiv	⊒	\sqdoublecup
★	\bigvarstar	+	\dotplus	□	\square
◆	\blackdiamond	×	\dottimes	田	\squplus
⊓	\cap	⊔	\doublebarwedge	·	\udot
†	\circplus	⊑	\doublecap	⊕	\uplus
*	\coasterisk	⊔	\doublecup	*	\varstar
*	\coAsterisk	⊴	\ltimes	▽	\vee
*	\convolution	⊕	\pluscirc	⊶	\veebar
⊓	\cup	⊴	\rtimes	⊶	\veedoublebar
▽	\curlyvee	■	\sqbullet	△	\wedge

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 56: MnSymbol Binary Operators

⊠	\amalg	⊤	\doublesqcup	∴	\righttherefore
*	\ast	⊷	\doublevee	×	\rightthreetimes
⊸	\backslash slashdiv	⊸	\doublewedge	⊸	\rightY
⊸	\bowtie	∴	\downtherefore	⊸	\rtimes
●	\bullet	⊸	\downY	⊸	\slashdiv
⊓	\cap	⊸	\dtimes	Π	\smallprod
⊸	\capdot	∴	\fivedots	□	\sqcap
⊸	\capplus	∞	\hbiopropto	□	\sqcapdot
·	\cdot	..	\hddotdot	□	\sqcapplus
○	\circ	⊸	\lefthalfcap	□	\sqcup
▽	\closedcurlyvee	⊸	\lefthalfcup	□	\sqcupdot
△	\closedcurlywedge	∴	\lefttherefore	⊸	\sqcupplus
⊓	\cup	⊸	\leftthreetimes	∴	\squaredots
⊸	\cupdot	⊸	\leftY	×	\times
⊸	\cupplus	⊸	\ltimes	·	\udotdot
▽	\curlyvee	⊸	\medbackslash	∴	\uptherefore
▽	\curlyveedot	○	\medcircle	∧	\upY
△	\curlywedge	⊸	\medslash	⊸	\utimes
△	\curlywedgedot		\medvert	8	\vbipropto
·	\ddotdot	⊸	\medvertdot	:	\vdotdot
·	\diamondddots	-	\minus	▽	\vee
÷	\div	-	\minusdot	▽	\veedot

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\cdot	<code>\dotmedvert</code>	\mp	<code>\mp</code>	\bowtie	<code>\vertbowtie</code>
\div	<code>\dotminus</code>	\wp	<code>\neswbipropto</code>	\div	<code>\vertdiv</code>
\cap	<code>\doublecap</code>	\nwarrow	<code>\nwsebipropto</code>	\wedge	<code>\wedge</code>
\cup	<code>\doublecup</code>	\oplus	<code>\plus</code>	\wedge	<code>\wedgedot</code>
\wr	<code>\doublecurlyvee</code>	\pm	<code>\pm</code>	\wreath	<code>\wreath</code>
\wedge	<code>\doublecurlywedge</code>	\neg	<code>\righthalfcap</code>		
\sqcap	<code>\doublesqcap</code>	\sqcup	<code>\righthalfcup</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 57: fdsymbol Binary Operators

\amalg	<code>\amalg</code>	\vee	<code>\doublevee</code>	\rtimes	<code>\rtimes</code>
\ast	<code>\ast</code>	\wedge	<code>\doublewedge</code>	\setminus	<code>\setminus</code>
\barwedge	<code>\barwedge</code>	\Downarrow	<code>\downY</code>	\sqcap	<code>\sqcap</code>
\cap	<code>\cap</code>	\times	<code>\dtimes</code>	\sqcapdot	<code>\sqcapdot</code>
\cdot	<code>\cdot</code>	\cdots	<code>\hcdotdot</code>	\sqcapplus	<code>\sqcapplus</code>
\cdot	<code>\cdot</code>	\top	<code>\intercal</code>	\sqcup	<code>\sqcup</code>
\cdot	<code>\cdot</code>	\rightarrow	<code>\intprod</code>	\sqcupdot	<code>\sqcupdot</code>
\cdot	<code>\centerdot</code>	\leftarrow	<code>\intprodR</code>	\sqcupplus	<code>\sqcupplus</code>
\cup	<code>\cup</code>	\times	<code>\leftthreetimes</code>	\times	<code>\times</code>
\cupdot	<code>\cupdot</code>	\leftarrow	<code>\leftY</code>	\times	<code>\timesbar</code>
\cupplus	<code>\cupplus</code>	\bowtie	<code>\ltimes</code>	$\cdot\cdot$	<code>\udotdot</code>
\curlyvee	<code>\curlyvee</code>	\swarrow	<code>\medbackslash</code>	\bowtie	<code>\upbowtie</code>
\curlywedge	<code>\curlywedge</code>	\swarrow	<code>\medslash</code>	\upY	<code>\upY</code>
$\ddot{\cdot}$	<code>\ddot{\cdot}</code>	$-$	<code>\minus</code>	\times	<code>\utimes</code>
\div	<code>\div</code>	$-$	<code>\minusdot</code>	\varamalg	<code>\varamalg</code>
\divideontimes	<code>\divideontimes</code>	\div	<code>\minusfdots</code>	\vdotdot	<code>\vdotdot</code>
\divslash	<code>\divslash</code>	\div	<code>\minusrdots</code>	\vdots	<code>\vdots</code>
\dotminus	<code>\dotminus</code>	\mp		\vee	<code>\vee</code>
\dotplus	<code>\dotplus</code>	$+$	<code>\plus</code>	\veebar	<code>\veebar</code>
\dottimes	<code>\dottimes</code>	$+$	<code>\plusdot</code>	\veedot	<code>\veedot</code>
\doublebarwedge	<code>\doublebarwedge</code>	\pm	<code>\pm</code>	\veebar	<code>\veebar</code>
\doublecap	<code>\doublecap</code>	\sqcup	<code>\pullback</code>	\wedge	<code>\wedge</code>
\doublecup	<code>\doublecup</code>	\sqcap	<code>\pushout</code>	\wedge	<code>\wedgedot</code>
\doublesqcap	<code>\doublesqcap</code>	\times	<code>\rightthreetimes</code>	\wr	<code>\wreath</code>
\doublesqcup	<code>\doublesqcup</code>	\times	<code>\rightY</code>		

`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 `\intprod`; `\hourglass` as a synonym for `\upbowtie`; `\land` as a synonym for `\wedge`; `\lor` as a synonym for `\vee`; `\minushookup` as a synonym for `\intprod`; `\smalldivslash` 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`; `\wedgeonwedge` as a synonym for `\doublewedge`; and `\wr` as a synonym for `\wreath`).

TABLE 58: `boisik` Binary Operators

*	<code>\ast</code>	\times	<code>\dottimes</code>	\blacktriangleleft	<code>\rtimesblack</code>
ϕ	<code>\baro</code>	$\bar{\wedge}$	<code>\doublebarwedge</code>	\smallsetminus	<code>\smallsetminus</code>
\barwedge	<code>\barwedge</code>	$:$	<code>\fatsemi</code>	\divideontimes	<code>\smashtimes</code>
\barwedge	<code>\bbslash</code>	$>$	<code>\gtrdot</code>	\sqcup	<code>\squplus</code>
$\&$	<code>\binampersand</code>	\top	<code>\intercal</code>	\parallel	<code>\sslash</code>
\wp	<code>\bindnasrepma</code>	\setminus	<code>\lbag</code>	\times	<code>\times</code>
\blacktriangleright	<code>\blackbowtie</code>	\blacktriangleleft	<code>\lblackbowtie</code>	\uplus	<code>\uplus</code>
\bowtie	<code>\bowtie</code>	\triangleleft	<code>\leftslice</code>	\cap	<code>\varcap</code>
\cap	<code>\cap</code>	\times	<code>\leftthreetimes</code>	\cup	<code>\varcup</code>
\Cap	<code>\Cap</code>	\triangleleft	<code>\lessdot</code>	\top	<code>\varintercal</code>
\cdot	<code>\cdot</code>	\times	<code>\ltimes</code>	\square	<code>\varsqcap</code>
\cdot	<code>\centerdot</code>	\blacktriangleleft	<code>\ltimesblack</code>	\square	<code>\varsqcup</code>
\circ	<code>\circplus</code>	\wedge	<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>	\wp	<code>\Vee</code>
\cup	<code>\cup</code>	\mp	<code>\mp</code>	\veebar	<code>\veebar</code>
\Cup	<code>\Cup</code>	\mp	<code>\nplus</code>	\veeonvee	<code>\veeonvee</code>
\curlywedge	<code>\cupleftarrow</code>	\oplus	<code>\pluscirc</code>	\wedge	<code>\wedge</code>
\curlyvee	<code>\curlyvee</code>	\star	<code>\plustrif</code>	\wedge	<code>\Wedge</code>
\curlywedge	<code>\curlywedge</code>	\pm	<code>\pm</code>	\downarrow	<code>\Ydown</code>
\dag	<code>\dagger</code>	\int	<code>\rbag</code>	\prec	<code>\Yleft</code>
\ddag	<code>\ddagger</code>	\blacktriangleleft	<code>\rblackbowtie</code>	\succ	<code>\Yright</code>
\div	<code>\div</code>	\triangleright	<code>\rightslice</code>	\prec	<code>\Yup</code>
$*$	<code>\divideontimes</code>	\times	<code>\rightthreetimes</code>		
\dotplus	<code>\dotplus</code>	\times	<code>\rtimes</code>		

TABLE 59: stix Binary Operators

\amalg	;	\fcmp	\sqcup	\sqcupcup
\ast	/	\fracslash	\sqcup	\Sqcup
\barcap	\intercal	\intercal	//	\sslash
\barcup	\interleave	\interleave	:	\threedotcolon
\barvee	\intprod	\intprod	\times	\times
\barwedge	\intprodr	\intprodr	\times	\timesbar
\bigslopedvee	\invlazys	\invlazys	-	\tminus
\bigslopedwedge	\leftthreetimes	\leftthreetimes	+	\tplus
\btimes	\lhd	\lhd	#	\tripleplus
\cap	\ltimes	\ltimes	///	\trslash
\Cap	\midbarvee	\midbarvee	\cap	\twocaps
\capbarcup	\midbarwedge	\midbarwedge	\cup	\twocups
\capdot	\minusdot	\minusdot	:	\typecolon
\capovercup	\minusfdots	\minusfdots	\ominus	\uminus
\capwedge	\minusrdots	\minusrdots	\trianglelefteq	\unlhd
\closedvarcap	\mp	\mp	\trianglerighteq	\unrhd
\closedvarcup	\nhVvert	\nhVvert	\wp	\upand
\closedvarcupsmashprod	\opluslhrim	\opluslhrim	\oplus	\uplus
\commaminus	\oplusrhrim	\oplusrhrim	\wedge	\varbarwedge
\cup	\otimeslhrim	\otimeslhrim	\wedge	\vardoublebarwedge
\Cup	\otimesrhrim	\otimesrhrim	\veebar	\varveebar
\cupbarcap	\plusdot	\plusdot	\times	\vectimes
\cupdot	\pluseqq	\pluseqq	\vee	\Vee
\cupleftarrow	\plushat	\plushat	\vee	\vee
\cupovercap	\plussim	\plussim	\veebar	\veebar
\cupvee	\plussubtwo	\plussubtwo	\veedot	\veedot
\curlyvee	\plustrif	\plustrif	\veebar	\veedoublebar
\curlywedge	\pm	\pm	\veemidvert	\veemidvert
\dagger	\rhd	\rhd	\veeodot	\veeodot
\ddagger	\rightthreetimes	\rightthreetimes	\veeonvee	\veeonvee
\div	\ringplus	\ringplus	\wedge	\Wedge
\divideontimes	\rsolbar	\rsolbar	\wedge	\wedge
\dotminus	\rtimes	\rtimes	\wedgebar	\wedgebar
\dotplus	\setminus	\setminus	\wedgedot	\wedgedot
\dottimes	\shuffle	\shuffle	\wedgedoublebar	\wedgedoublebar
\doublebarvee	\simplus	\simplus	\wedgemidvert	\wedgemidvert
\doublebarwedge	\smallsetminus	\smallsetminus	\wedgeodot	\wedgeodot
\doubleplus	\smashtimes	\smashtimes	\wedgeonwedge	\wedgeonwedge
\dsol	\sqcap	\sqcap	\wr	\wr
\eqqplus	\Sqcup	\Sqcup		

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 60: `mathdesign` Binary Operators
 $\times \ \backslash dtimes \quad \times \ \backslash udtimes \quad \times \ \backslash utimes$

The `mathdesign` package additionally provides versions of each of the binary operators shown in Table 51 on page 31.

TABLE 61: `cml` Binary Operators
 $\divideontimes \ \backslash parr^* \quad \& \ \backslash with^\dagger$

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

\dagger `\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 62: `shuffle` Binary Operators
 $\boxplus \ \backslash cshuffle \quad \boxminus \ \backslash shuffle$
TABLE 63: `ulsy` Geometric Binary Operators
 $\oplus \ \backslash odplus$
TABLE 64: `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>\oright</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>\backslash</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 65: MnSymbol Geometric Binary Operators

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

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 66: fdsymbol Geometric Binary Operators

□	\boxbackslash	▼	\medblacktriangledown	⊕	\oplus
▣	\boxbox	◀	\medblacktriangleleft	⊘	\oslash
▣	\boxdot	▶	\medblacktriangleright	⊗	\otimes
▣	\boxminus	▲	\medblacktriangleup	▷	\overt
▣	\boxplus	○	\medcircle	●	\smallblackcircle
▣	\boxslash	◇	\meddiamond	◆	\smallblackdiamond
▣	\boxtimes	/	\medslash	■	\smallblacksquare
▣	\boxvert	□	\medsquare	★	\smallblackstar
◇	\diamondbackslash	▽	\medtriangledown	▼	\smallblacktriangledown
◇	\diamonddiamond	◀	\medtriangleleft	◀	\smallblacktriangleleft
◇	\diamonddot	▶	\medtriangleright	▶	\smallblacktriangleright
◇	\diamondminus	△	\medtriangleup	▲	\smallblacktriangleup
◇	\diamondplus	☆	\medwhitestar	○	\smallcircle
◇	\diamondslash	⊗	\oast	◊	\smalldiamond
◇	\diamondtimes	⊗	\obackslash	□	\smallsquare
◇	\diamondvert	◎	\ocirc	▽	\smalltriangledown

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●	\medblackcircle	⊖	\odash	◀	\smalltriangleleft
◆	\medblackdiamond	⊙	\odot	▷	\smalltriangleright
■	\medblacksquare	≡	\oequal	△	\smalltriangleup
★	\medblackstar	⊖	\ominus	☆	\smallwhitestar

fdsymbol defines synonyms for most of the preceding symbols:

◆	\blackdiamond	◊	\diamond	•	\smbblkcircle
▲	\blacktriangle	◊	\Diamond	◆	\smbblkdiamond
▼	\blacktriangledown	◊	\diamonddbslash	■	\smbblksquare
◀	\blacktriangleleft	◊	\diamondcdot	☆	\smwhitestar
▶	\blacktriangleright	◆	\mdblkdiamond	○	\smwhtcircle
□	\Box	■	\mdblksquare	◊	\smwhtdiamond
□	\boxbar	●	\mdlgbkcircle	□	\smwhtsquare
□	\boxbslash	◆	\mdlgbkdiamond	□	\square
□	\boxdiag	■	\mdlgbksquare	★	\star
●	\bullet	○	\mdlgwhtcircle	△	\triangle
○	\circ	◊	\mdlgwhtdiamond	▽	\triangledown
⊗	\circledast	□	\mdlgwhtsquare	◀	\triangleleft
◎	\circledcirc	◊	\mdwhtdiamond	▶	\triangleright
⊖	\circleddash	□	\mdwhtsquare	△	\vartriangle
≡	\circledequal	★	\medstar		
○	\circledvert	◎	\obslash		

TABLE 67: boisik Geometric Binary Operators

◆	\blacklozenge	□	\boxright	□	\oblong
■	\blacksquare	□	\boxslash	⊕	\obot
▲	\blacktriangle	□	\boxtimes	⊗	\obslash
▼	\blacktriangledown	□	\boxtop	⊗	\ogreaterthan
◀	\blacktriangleleft	□	\boxtriangle	⊕	\oleft
▶	\blacktriangleright	⊕	\circledast	⊗	\olessthan
☒	\boxast	○	\circledcirc	⊖	\ominus
□	\boxbar	○	\circleddash	⊕	\oplus
☒	\boxbot	◊	\diamond	⊕	\oright
☒	\boxbox	◊	\diamondbar	○	\oslash
□	\boxbslash	◊	\diamondcircle	⊗	\otimes
○	\boxcircle	◊	\diamondminus	⊕	\otop
☒	\boxdivision	◊	\diamondop	⊗	\otriangle
□	\boxdot	◊	\diamondplus	⊗	\ovee
☒	\boxleft	◊	\diamondtimes	⊗	\owedge
☒	\boxminus	◊	\diamondtriangle	*	\star
☒	\boxplus	○	\obar	□	\talloblong

TABLE 68: stix Geometric Binary Operators

\blacksquare	<code>\blackhourglass</code>	\diamond	<code>\concavediamondtickleleft</code>	\oplus	<code>\oplus</code>
\boxast	<code>\boxast</code>	\diamond	<code>\concavediamondtickright</code>	\oslash	<code>\oslash</code>
\boxbar	<code>\boxbar</code>	\diamond	<code>\diamond</code>	\otimes	<code>\otimes</code>
\boxbox	<code>\boxbox</code>	\triangleleft	<code>\dsub</code>	\otimes	<code>\otimes</code>
\boxbslash	<code>\boxbslash</code>	\boxtimes	<code>\hourglass</code>	\otimeshat	<code>\otimeshat</code>
\boxcircle	<code>\boxcircle</code>	\lozenge	<code>\lozengeminus</code>	\rsub	<code>\rsub</code>
\boxdiag	<code>\boxdiag</code>	\blacklozenge	<code>\mdlgbklozenge</code>	\bullet	<code>\smbblkcircle</code>
\boxdot	<code>\boxdot</code>	\circ	<code>\mdlwgwtcircle</code>	\star	<code>\star</code>
\boxminus	<code>\boxminus</code>	\ominus	<code>\obar</code>	\talloblong	<code>\talloblong</code>
\boxplus	<code>\boxplus</code>	\oplus	<code>\obot^*</code>	\triangle	<code>\triangle</code>
\boxtimes	<code>\boxtimes</code>	\oslash	<code>\obslash</code>	\triangleleft	<code>\triangleleft</code>
\circledast	<code>\circledast</code>	\oplus	<code>\odiv</code>	\triangleplus	<code>\triangleplus</code>
\circledcirc	<code>\circledcirc</code>	\odot	<code>\odot</code>	\trianglerights	<code>\trianglerights</code>
\circleddash	<code>\circleddash</code>	\oslash	<code>\odotslashdot^*</code>	\triangleleft	<code>\triangleleft</code>
\circledeq	<code>\circledeq</code>	\oslash	<code>\ogreaterthan</code>	\bullet	<code>\vysmblkcircle^\dagger</code>
\circledparallel	<code>\circledparallel</code>	\boxtimes	<code>\olcross^*</code>	\circ	<code>\vysmwhtcircle</code>
\circledvert	<code>\circledvert</code>	\oslash	<code>\olessthan</code>	\square	<code>\whitesquaretickleleft</code>
\circlearrowleft	<code>\circlearrowleft</code>	\ominus	<code>\ominus</code>	\square	<code>\whitesquaretickleright</code>
\diamond	<code>\concavediamond</code>	\circledcirc	<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 381, which is why they are included here.

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

TABLE 69: halloweenmath Halloween-Themed Math Operators

\pumpkin	<code>\bigpumpkin</code> [‡]	\ghost	<code>\mathrightghost</code>	\cloud	<code>\reversemathcloud</code>
\mathcloud	<code>\mathcloud</code>	\mathwitch	<code>\mathwitch</code> [†]	\mathwitch	<code>\reversemathwitch</code> [†]
\mathghost	<code>\mathghost</code>	$\mathwitch*$	<code>\mathwitch*</code> [†]	\mathwitch	<code>\reversemathwitch*</code> [†]
\mathleftghost	<code>\mathleftghost</code>	\pumpkin	<code>\pumpkin</code>		

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

in display mode.

[‡] `\greatpumpkin` is a synonym for `\bigpumpkin`.

TABLE 70: stix Small Integrals

\smallawint	\smallawintcap	\smalloint
\smallcirlfnint	$\text{\smallcirlfnintclockwise}$	$\text{\smallointctrcclockwise}$
\smallfint	\smallfintcup	\smallpointint
\smalliiint	\smalliiintlarhk	\smallrppoint
\smalliiint	\smalliiintx	\smallscpolint
\smalliiint	\smalllowint	\smallsqint
\smalliiint	\smallnpoint	\smallsumint
\smallintbar	\smalloiint	\smallupoint
\smallintBar	\smalloint	$\text{\smallvarointclockwise}$

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 71.

TABLE 71: stix Small Integrals with Explicit Slant

\smallawintsl	\smallawintup
\smallcirlfnintsl	\smallcirlfnintup
\smallfintsl	\smallfintup
\smalliiintsl	\smalliiintup
\smallintbarsl	\smallintBarup
\smallintBarsl	\smallintbarup
\smallintcapsl	\smallintcapup
$\text{\smallintclockwisesl}$	$\text{\smallintclockwiseup}$
\smallintcupsl	\smallintcupup
\smallintlarhksl	\smallintlarhkup
\smallintsl	\smallintup
\smallintxsl	\smallintxup
\smalllowintsl	\smalllowintup
\smallnpointsl	\smallnpointup
\smalloiintsl	\smalloiintup
\smallointsl	\smallointup
$\text{\smallointctrcclockwisesl}$	$\text{\smallointctrcclockwiseup}$
\smallointsl	\smallointup
\smallpointintsl	\smallpointintup
\smallrppointsl	\smallrppointup
\smallscpolintsl	\smallscpolintup
\smallsqintsl	\smallsqintup
\smallsumintsl	\smallsumintup
\smallupintsl	\smallupintup
$\text{\smallvarointclockwisesl}$	$\text{\smallvarointclockwiseup}$

Instead of using the preceding symbols directly, it is generally preferable to use the symbols listed in Table 70 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 (`s1`) variant. Use the symbols shown in Table 71 only when you need to include both upright and slanted variations of a symbol in the same document.

TABLE 72: 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>	$\uplus \uplus$	<code>\biguplus</code>	$\int \int$	<code>\int</code>		
$\oplus \oplus$	<code>\bigoplus</code>	$\vee \vee$	<code>\bigvee</code>	$\oint \oint$	<code>\oint</code>		

TABLE 73: *AMS* Variable-sized Math Operators

\iint	\iint	<code>\iint</code>	\iiint	\iiint	<code>\iiint</code>
\iiint	\iiint	<code>\iiint</code>	$\dots \int$	$\dots \int$	<code>\idotsint</code>

TABLE 74: *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>	$\oplus \oplus$	<code>\bignplus</code>	$\nabla \nabla$	<code>\bigtriangledown</code>
$\curlywedge \curlywedge$	<code>\bigcurlywedge</code>	$\parallel \parallel$	<code>\bigparallel</code>	$\Delta \Delta$	<code>\bigtriangleup</code>

TABLE 75: `wasysym` Variable-sized Math Operators

$\int \int \ \backslash int$	$\iint \iint \ \backslash iint$	$\iiint \iiint \ \backslash iiint$
$\oint \oint \ \backslash oint$	$\oint \oint \ \backslash oint$	

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 76: `mathabx` Variable-sized Math Operators

\curlyvee	<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>
$\wedge \wedge$	<code>\bigcurlywedge</code>	$\boxdot \boxdot$	<code>\bigboxtop</code>	$\ominus \ominus$	<code>\bigotop</code>
$\boxast \boxast$	<code>\bigboxasterisk</code>	$\triangle \triangle$	<code>\bigboxtriangleup</code>	$\triangleleft \triangleleft$	<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>	$\boxast \boxast$	<code>\bigoasterisk</code>	$\boxplus \boxplus$	<code>\bigsqplus</code>
$\boxcoasterisk \boxcoasterisk$	<code>\bigboxcoasterisk</code>	$\oslash \oslash$	<code>\bigbackslash</code>	$\times \times$	<code>\bigtimes</code>
$\boxdiv \boxdiv$	<code>\bigboxdiv</code>	$\ominus \oplus$	<code>\bigobot</code>	$\iiint \iiint$	<code>\iiint</code>
$\boxdot \boxdot$	<code>\bigboxdot</code>	$\odot \odot$	<code>\bigocirc</code>	$\iint \iint$	<code>\iint</code>

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$\boxplus \boxminus$	$\backslash bigboxleft$	$\circledast \circledast$	$\backslash bigocoasterisk$	$\int \int$	$\backslash int$
$\boxminus \boxminus$	$\backslash bigboxminus$	$\odot \odot$	$\backslash bigodiv$	$\oint \oint$	$\backslash ooint$
$\boxplus \boxplus$	$\backslash bigboxplus$	$\ominus \oplus$	$\backslash bigoleft$	$\oint \oint$	$\backslash ooint$
$\boxminus \boxplus$	$\backslash bigboxright$	$\ominus \ominus$	$\backslash bigominus$		

TABLE 77: `txfonts/pxfonts` Variable-sized Math Operators

$\sqcup \sqcap$	$\backslash bigsqcupplus$	$\oint \oint$	$\backslash ointclockwise$
$\sqcup \sqcup$	$\backslash bigsqcupplus$	$\oint \oint$	$\backslash ointctrcclockwise$
$f f$	$\backslash fint$	$\oint \oint \oint$	$\backslash sqiint$
$\int \dots \int \int \dots \int$	$\backslash idotsint$	$\oint \oint \oint$	$\backslash sqiint$
$\oint \oint \oint \oint$	$\backslash iiiint$	$\oint \oint$	$\backslash sqint$
$\oint \oint \oint \oint$	$\backslash iiint$	$\oint \oint \oint$	$\backslash varoiiintclockwise$
$\oint \oint$	$\backslash iint$	$\oint \oint \oint$	$\backslash varoiiintctrcclockwise$
$\oint \oint \oint$	$\backslash oiiintclockwise$	$\oint \oint$	$\backslash varoointclockwise$
$\oint \oint \oint$	$\backslash oiiintctrcclockwise$	$\oint \oint$	$\backslash varoointctrcclockwise$
$\oint \oint \oint$	$\backslash oiiint$	$\oint \oint$	$\backslash varointclockwise$

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\oint	$\oint\oint$	<code>\oiintclockwise</code>	\oint	$\oint\oint$	<code>\varointctrcclockwise</code>
\oint	$\oint\oint$	<code>\oiintctrcclockwise</code>	\times	\times	<code>\varprod</code>
\oint	$\oint\oint$	<code>\oiint</code>			

TABLE 78: esint Variable-sized Math Operators

$\int \cdots \int$	$\int \cdots \int$	<code>\dotsint</code>	\oint	\oint	<code>\ointclockwise</code>
f	f	<code>\fint</code>	\oint	\oint	<code>\ointctrcclockwise</code>
\iiint	\iiint	<code>\iiint</code>	$\oint\oint$	$\oint\oint$	<code>\sqiint</code>
\iiint	\iiint	<code>\iiint</code>	\oint	\oint	<code>\sqint</code>
\iint	\iint	<code>\iint</code>	$\oint\oint$	$\oint\oint$	<code>\varoiint</code>
f	f	<code>\landdownint</code>	\oint	\oint	<code>\varointclockwise</code>
f	f	<code>\landupint</code>	\oint	\oint	<code>\varointctrcclockwise</code>
\oint	$\oint\oint$	<code>\oiint</code>			

TABLE 79: `bigints` Variable-sized Math Operators

\int	\int	<code>\bigint</code>	\oint	\int	<code>\bigoint</code>
\int	\int	<code>\bigints</code>	\oint	\int	<code>\bigoints</code>
\int	\int	<code>\bigintss</code>	\oint	\int	<code>\bigintss</code>
\int	\int	<code>\bigintsss</code>	\oint	\int	<code>\bigintsss</code>
\int	\int	<code>\bigintssss</code>	\oint	\int	<code>\bigintssss</code>

 TABLE 80: `MnSymbol` Variable-sized Math Operators

\cap	\cap	<code>\bigcap</code>	\ominus	\ominus	<code>\bigominus</code>	\complement	\complement	<code>\complement</code>
\capdot	\capdot	<code>\bigcapdot</code>	\oplus	\oplus	<code>\bigoplus</code>	\coprod	\coprod	<code>\coprod</code>
\capplus	\capplus	<code>\bigcapplus</code>	\oslash	\oslash	<code>\bigoslash</code>	$\cdots\int$	$\int\cdots\int$	<code>\idotsint</code>
\circlearrowleft	\circlearrowleft	<code>\bigcircle</code>	\circledast	\circledast	<code>\bigostar</code>	\iiint	\iiiiint	<code>\iiint</code>
\bigcup	\bigcup	<code>\bigcup</code>	\otimes	\otimes	<code>\bigotimes</code>	\iiii	\iiiiii	<code>\iiint</code>
\bigcupdot	\bigcupdot	<code>\bigcupdot</code>	\triangleleft	\triangleleft	<code>\bigotriangle</code>	\iint	\iint	<code>\iint</code>
\bigcupplus^*	\bigcupplus^*	<code>\bigcupplus^*</code>	\odot	\odot	<code>\bigovert</code>	\int	\int	<code>\int</code>
\bigcurlyvee	\bigcurlyvee	<code>\bigcurlyvee</code>	$+$	$+$	<code>\bigplus</code>	\oint	\oint	<code>\oint</code>
\bigcurlyveedot	\bigcurlyveedot	<code>\bigcurlyveedot</code>	\sqcap	\sqcap	<code>\bigsqcap</code>	\oint	\oint	<code>\oint</code>
\bigcurlywedge	\bigcurlywedge	<code>\bigcurlywedge</code>	\sqcapdot	\sqcapdot	<code>\bigsqcapdot</code>	\oint	\oint	<code>\oint</code>
\bigcurlywedgedot	\bigcurlywedgedot	<code>\bigcurlywedgedot</code>	\sqplus	\sqplus	<code>\bigsqcapplus</code>	\oint	\oint	<code>\oint</code>
\bigdoublecurlyvee	\bigdoublecurlyvee	<code>\bigdoublecurlyvee</code>	\sqcup	\sqcup	<code>\bigsqcup</code>	\oint	\oint	<code>\oint</code>
\bigdoublecurlywedge	\bigdoublecurlywedge	<code>\bigdoublecurlywedge</code>	\sqcupdot	\sqcupdot	<code>\bigsqcupdot</code>	\oint	\oint	<code>\oint</code>

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\mathbb{W}	\mathbb{V}	<code>\bigdoublevee</code>	\sqcup	\sqplus	<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>
\otimes	\otimes	<code>\bigoast</code>	\vee	\vee	<code>\bigvee</code>	\oint	\oint	<code>\rcirclerightint</code>
\oslash	\oslash	<code>\bigobackslash</code>	\forall	\forall	<code>\bigveedot</code>	f	f	<code>\strokedint</code>
\odot	\odot	<code>\bigocirc</code>	\wedge	\wedge	<code>\bigwedge</code>	\sum	\sum	<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 81: `fdsymbol` Variable-sized Math Operators

\cap	\cap	<code>\bigcap</code>	\sqcup	\sqcup	<code>\bigsqcup</code>	\oint	\oint	<code>\landupint</code>
\capdot	\capdot	<code>\bigcapdot</code>	\sqcupdot	\sqcupdot	<code>\bigsqcupdot</code>	\oint	\oint	<code>\lcircleleftint</code>
\capplus	\capplus	<code>\bigcapplus</code>	\squplus	\squplus	<code>\bigsqcupplus</code>	\oint	\oint	<code>\lcirclerightint</code>
\cup	\cup	<code>\bigcup</code>	\times	\times	<code>\bigtimes</code>	$\oint\oint\oint$	$\oint\oint\oint$	<code>\oiint</code>
\cupdot	\cupdot	<code>\bigcupdot</code>	\vee	\vee	<code>\bigvee</code>	\oint	\oint	<code>\oint</code>
\cupplus	\cupplus	<code>\bigcupplus</code>	\forall	\forall	<code>\bigveedot</code>	\oint	\oint	<code>\oint</code>
\curlyvee	\curlyvee	<code>\bigcurlyvee</code>	\wedge	\wedge	<code>\bigwedge</code>	Σ	Σ	<code>\osum</code>
\curlywedge	\curlywedge	<code>\bigcurlywedge</code>	\wedge	\wedge	<code>\bigwedgedot</code>	\prod	\prod	<code>\prod</code>
\mathbb{W}	\mathbb{V}	<code>\bigdoublevee</code>	\coprod	\coprod	<code>\coprod</code>	\oint	\oint	<code>\rcircleleftint</code>
\mathbb{A}	\mathbb{A}	<code>\bigdoublewedge</code>	\fint	\fint	<code>\fint</code>	\oint	\oint	<code>\rcirclerightint</code>
\otimes	\otimes	<code>\bigoast</code>	$\dots\int$	$\dots\int$	<code>\idotsint</code>	\sum	\sum	<code>\sum</code>
\odot	\odot	<code>\bigodot</code>	\iiint	\iiint	<code>\iiint</code>	\oint	\oint	<code>\sumint</code>
\oplus	\oplus	<code>\bigoplus</code>	\iiint	\iiint	<code>\iiint</code>	\varcoprod	\varcoprod	<code>\varcoprod</code>

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\otimes	\bigotimes	<code>\bigotimes</code>	\iint	\iint	<code>\iint</code>	\sum	\sum	<code>\varosum</code>
$+$	$+$	<code>\bigplus</code>	\int	\int	<code>\int</code>	\prod	\prod	<code>\varprod</code>
\sqcap	\sqcap	<code>\bigsqcap</code>	\oint	\oint	<code>\intbar</code>	\sum	\sum	<code>\varsum</code>
\sqcdot	\sqcdot	<code>\bigsqcapdot</code>	\oint	\oint	<code>\intBar</code>	\oint	\oint	<code>\varsumint</code>
\sqcup	\sqcup	<code>\bigsqcupplus</code>	\oint	\oint	<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`, `\intctr-clockwise` as a synonym for `\landdownint`, `\modtwosum` as a synonym for `\osum`, `\ointclockwise` as a synonym for `\lcircleleftint`, `\ointctr-clockwise` as a synonym for `\rcirclerightint`, `\varmodtwosum` as a synonym for `\varosum`, `\varointclockwise` as a synonym for `\lcirclerightint`, and `\varointctr-clockwise` as a synonym for `\rcircleleftint`.

TABLE 82: `boisik` Variable-sized Math Operators

$$\int \quad \int \quad \text{\textbackslash intup}$$

`boisik` additionally provides all of the symbols in Table 72.

TABLE 83: `stix` Variable-sized Math Operators

\oint	\oint	<code>\awint</code>	\coprod	\coprod	<code>\coprod</code>	$\oint\!\oint$	$\oint\!\oint$	<code>\oiint</code>
\sum	\sum	<code>\Bbbsum</code>	\mathbb{W}	\mathbb{W}	<code>\disjquant</code>	\oint	\oint	<code>\ointint</code>
\cap	\cap	<code>\bigcap</code>	\oint	\oint	<code>\fint</code>	\oint	\oint	<code>\oint</code>
\cup	\cup	<code>\bigcup</code>	$\oint\!\oint\!\oint$	$\oint\!\oint\!\oint$	<code>\iiint</code>	\oint	\oint	<code>\ointctr-clockwise</code>

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\bigcup	\bigcup	<code>\bigcupdot</code>	\iiint	\iiint	<code>\iiint</code>	\oint	\oint	<code>\pointint</code>
\odot	\odot	<code>\bigodot</code>	\iint	\iint	<code>\iint</code>	\prod	\prod	<code>\prod</code>
\oplus	\oplus	<code>\bigoplus</code>	\int	\int	<code>\int</code>	\int	\int	<code>\rppolint</code>
\otimes	\otimes	<code>\bigotimes</code>	\int	\int	<code>\intbar</code>	\int	\int	<code>\scpolint</code>
\sqcap	\sqcap	<code>\bigsqcap</code>	\int	\int	<code>\intBar</code>	\int	\int	<code>\sqint</code>
\sqcup	\sqcup	<code>\bigsqcup</code>	\int	\int	<code>\intcap</code>	\sum	\sum	<code>\sum</code>
\bigtriangledown	\bigtriangledown	<code>\bigtalloblong</code>	\int	\int	<code>\intclockwise</code>	\oint	\oint	<code>\sumint</code>
\times	\times	<code>\bigtimes</code>	\int	\int	<code>\intcup</code>	\int	\int	<code>\upint</code>
\uplus	\uplus	<code>\biguplus</code>	\int	\int	<code>\intlarhk</code>	\oint	\oint	<code>\varointclockwise</code>
\vee	\vee	<code>\bigvee</code>	\int	\int	<code>\intx</code>	\backslash	\backslash	<code>\xbsol</code>
\wedge	\wedge	<code>\bigwedge</code>	\int	\int	<code>\lowint</code>	$/$	$/$	<code>\xsol</code>
\int	\int	<code>\cirfnint</code>	Σ	Σ	<code>\modtwosum</code>			
\wedge	\wedge	<code>\conjquant</code>	\int	\int	<code>\npolint</code>			

By default, each of the integral-producing commands in Table 83 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 84.

TABLE 84: stix Integrals with Explicit Slant

\int	\int	<code>\inttsl</code>	\int	\int	<code>\intup</code>
\iint	\iint	<code>\iinttsl</code>	\iint	\iint	<code>\iintup</code>
\iiint	\iiint	<code>\iiinttsl</code>	\iiint	\iiint	<code>\iiintup</code>
\oint	\oint	<code>\ointtsl</code>	\oint	\oint	<code>\ointup</code>
\oiint	\oiint	<code>\ointtsl</code>	\oiint	\oiint	<code>\ointup</code>
\oiint	\oiint	<code>\oiinttsl</code>	\oiint	\oiint	<code>\oiintup</code>
\int	\int	<code>\intclockwisesl</code>	\int	\int	<code>\intclockwiseup</code>
\oint	\oint	<code>\varointclockwisesl</code>	\oint	\oint	<code>\varointclockwiseup</code>
\oint	\oint	<code>\ointctr-clockwisesl</code>	\oint	\oint	<code>\ointctr-clockwiseup</code>
\sum	\sum	<code>\sumintsl</code>	\sum	\sum	<code>\sumintup</code>
\iiint	\iiint	<code>\iiinttsl</code>	\iiint	\iiint	<code>\iiintup</code>
\int	\int	<code>\intbarsl</code>	\int	\int	<code>\intbarup</code>
\int	\int	<code>\intBarsl</code>	\int	\int	<code>\intBarup</code>
\int	\int	<code>\fintsl</code>	\int	\int	<code>\fintup</code>
\int	\int	<code>\cirfnintsl</code>	\int	\int	<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>

(continued on next page)

(continued from previous page)

\oint	$\int \circlearrowleft$	<code>\npolintsl</code>	\oint	$\int \circlearrowright$	<code>\npolintup</code>
\ointint	$\ointint \circlearrowleft$	<code>\pointintsl</code>	\ointint	$\ointint \circlearrowright$	<code>\pointintup</code>
\ointint	$\ointint \circlearrowleft$	<code>\sqintsl</code>	\ointint	$\ointint \circlearrowright$	<code>\sqintup</code>
\ointint	$\ointint \circlearrowleft$	<code>\intlarhksl</code>	\ointint	$\ointint \circlearrowright$	<code>\intlarhkup</code>
\ointint	$\ointint \circlearrowleft$	<code>\intxsl</code>	\ointint	$\ointint \circlearrowright$	<code>\intxup</code>
\ointint	$\ointint \circlearrowleft$	<code>\intcapsl</code>	\ointint	$\ointint \circlearrowright$	<code>\intcapup</code>
\ointint	$\ointint \circlearrowleft$	<code>\intcupsl</code>	\ointint	$\ointint \circlearrowright$	<code>\intcupup</code>
\int	$\int \overline{\circlearrowleft}$	<code>\upintsl</code>	\int	$\int \overline{\circlearrowright}$	<code>\upintup</code>
\int	$\int \overline{\circlearrowleft}$	<code>\lowintsl</code>	\int	$\int \overline{\circlearrowright}$	<code>\lowintup</code>

Instead of using the preceding symbols directly, it is generally preferable to use the symbols listed in Table 83 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 84 only when you need to include both upright and slanted variations of a symbol in the same document.

TABLE 85: `mathdesign` Variable-sized Math Operators

\intclockwise	$\int \circlearrowleft$	<code>\intclockwise</code>	\ointclockwise	$\oint \circlearrowleft$	<code>\ointclockwise</code>
\oiint	$\oiint \circlearrowleft$	<code>\oiint</code>	\ointctrcclockwise	$\ointctrcclockwise \circlearrowleft$	<code>\ointctrcclockwise</code>
\oiint	$\oiint \circlearrowleft$	<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 (\oint), and Charter (\ointint).

TABLE 86: `prodint` Variable-sized Math Operators

 $\pi \quad \backslash\text{prodi} \quad \Pi \quad \backslash\text{Prodi} \quad \prod \quad \backslash\text{PRODI}$

`prodint` currently requires the author to manually specify `\prodi` for inlined expressions ($\$...$$), `\Prodi` for displayed math ($\backslash[...]$), 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 72.

 TABLE 87: `cml` Large Math Operators

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

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

TABLE 88: 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>	\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^AT_EX 2 _{ϵ} core. Use the `latexsym` package to expose this symbol.

[†] The difference between `\mid` and `|` is that the former is a binary relation while the latter is a math ordinal. Consequently, L^AT_EX 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 89: `AMS` Binary Relations

\approx	<code>\approxeq</code>	$=$	<code>\eqcirc</code>	\approx	<code>\succapprox</code>
\exists	<code>\backepsilon</code>	\equiv	<code>\fallingdotseq</code>	\asymp	<code>\succcurlyeq</code>
\sphericalangle	<code>\backsimeq</code>	\multimap		\succsim	<code>\succsim</code>
\sqsubseteq	<code>\backsimeq</code>	\pitchfork		\therefore	<code>\therefore</code>
\because	<code>\because</code>	\approx	<code>\precapprox</code>	\approx	<code>\thickapprox</code>
\between	<code>\between</code>	\approx	<code>\preccurlyeq</code>	\sim	<code>\thicksim</code>
\doteq	<code>\Bumpeq</code>	\approx	<code>\precsim</code>	\propto	<code>\varpropto</code>
\doteq	<code>\bumpeq</code>	\approx	<code>\risingdotseq</code>	\Vdash	<code>\Vdash</code>
\doteq	<code>\circeq</code>	\mid	<code>\shortmid</code>	\models	<code>\vDash</code>
\asymp	<code>\curlyeqprec</code>	\parallel	<code>\shortparallel</code>	\Vdash	<code>\Vdash</code>
\asymp	<code>\curlyeqsucc</code>	\sim	<code>\smallfrown</code>		
\doteqdot	<code>\doteqdot</code>	\sim	<code>\smallsmile</code>		

TABLE 90: *AMS* Negated Binary Relations

$\not\cong$	<code>\ncong</code>	$\not\parallel$	<code>\nshortparallel</code>	$\not\models$	<code>\nVDash</code>
$\not\mid$	<code>\nmid</code>	$\not\sim$	<code>\nsim</code>	$\not\approx$	<code>\precapprox</code>
$\not\parallel$	<code>\nparallel</code>	$\not\succ$	<code>\nsucc</code>	$\not\approx$	<code>\precsim</code>
$\not\prec$	<code>\nprec</code>	$\not\approx$	<code>\nsuccapprox</code>	$\not\approx$	<code>\succapprox</code>
$\not\preceq$	<code>\npreceq</code>	$\not\models$	<code>\nvDash</code>	$\not\approx$	<code>\succnsim</code>
$\not\sim$	<code>\nshortmid</code>	$\not\models$	<code>\nvdash</code>	$\not\approx$	<code>\succnsim</code>

TABLE 91: *stmaryrd* Binary Relations

$\in \inplus \ni \niplus$

TABLE 92: *wasy sym* Binary Relations

\sqsubset	<code>\invneg</code>	\rightsquigarrow	<code>\leadsto</code>	\propto	<code>\wasyproto</code>
\bowtie	<code>\Join</code>	\otimes	<code>\logof</code>		

TABLE 93: *txfonts/pxfonts* Binary Relations

\oslash	<code>\circledgtr</code>	\ltimes	<code>\lJoin</code>	\times	<code>\opentimes</code>
\oslash	<code>\circledless</code>	\ltimes	<code>\lRtimes</code>	$\perp\!\!\!\perp$	<code>\Perp</code>
\approx	<code>\colonapprox</code>	\multimap	<code>\multimap</code>	$\approx\!\!\!\approx$	<code>\preceqq</code>
$\approx\approx$	<code>\Colonapprox</code>	\multimapboth	<code>\multimapboth</code>	$\approx\!\!\!\approx$	<code>\precneqq</code>
\vdash	<code>\coloneq</code>	$\circ\!\!\!\circ$	<code>\multimapbothvert</code>	\rtimes	<code>\rJoin</code>
$\vdash\vdash$	<code>\Coloneq</code>	$\bullet\!\!\!\bullet$	<code>\multimapdot</code>	\triangleleft	<code>\strictfi</code>
$\vdash\vdash$	<code>\Coloneqq</code>	$\bullet\!\!\!\bullet$	<code>\multimapdotboth</code>	$\triangleleft\!\!\!\triangleleft$	<code>\strictif</code>
$\vdash\vdash$	<code>\coloneqq^*</code>	$\circ\!\!\!\circ$	<code>\multimapdotbothA</code>	$\trianglelefteq\!\!\!\trianglelefteq$	<code>\strictiff</code>
$\approx\approx$	<code>\Colonsim</code>	$\bullet\!\!\!\bullet$	<code>\multimapdotbothAvert</code>	$\approx\!\!\!\approx$	<code>\succeqq</code>
$\approx\approx$	<code>\colonsim</code>	$\bullet\!\!\!\circ$	<code>\multimapdotbothB</code>	$\approx\!\!\!\approx$	<code>\succneqq</code>
$\vdash\vdash$	<code>\Eqcolon</code>	$\bullet\!\!\!\circ$	<code>\multimapdotbothBvert</code>	$\parallel\!\!\!\parallel$	<code>\varparallel</code>
$\vdash\vdash$	<code>\eqcolon</code>	$\bullet\!\!\!\bullet$	<code>\multimapdotbothvert</code>	$\parallel\!\!\!\parallel$	<code>\varparallelinv</code>
$\vdash\vdash$	<code>\eqqcolon</code>	$\bullet\!\!\!\bullet$	<code>\multimapdotinv</code>	$\models\!\!\!\models$	<code>\VvDash</code>
$\vdash\vdash$	<code>\Eqqcolon</code>	$\circ\!\!\!\circ$	<code>\multimapinv</code>		
$\approx\approx$	<code>\eqsim</code>	$\times\!\!\!\times$	<code>\openJoin</code>		

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

TABLE 94: txfonts/pfxfonts Negated Binary Relations

$\not\approx$	<code>\napproxeq</code>	$\not\approx$	<code>\npreccurlyeq</code>	$\not\approx$	<code>\nthickapprox</code>
$\not\asymp$	<code>\nasym</code>	$\not\asymp$	<code>\preceqq</code>	$\not\asymp$	<code>\twoheadleftarrow</code>
$\not\backsim$	<code>\backsim</code>	$\not\backsim$	<code>\precsim</code>	$\not\backsim$	<code>\twoheadrightarrow</code>
$\not\backsimeq$	<code>\backsimeq</code>	$\not\backsimeq$	<code>\simeq</code>	$\not\backsimeq$	<code>\nparallel</code>
$\not\bumpeq$	<code>\bumpeq</code>	$\not\bumpeq$	<code>\succapprox</code>	$\not\bumpeq$	<code>\nparallelinv</code>
$\not\Bumpeq$	<code>\Bumpeq</code>	$\not\Bumpeq$	<code>\succcurlyeq</code>	$\not\Bumpeq$	<code>\nVdash</code>
$\not\equiv$	<code>\equiv</code>	$\not\equiv$	<code>\succeq</code>	$\not\equiv$	
$\not\precapprox$	<code>\precapprox</code>	$\not\precapprox$	<code>\succsim</code>	$\not\precapprox$	

TABLE 95: mathabx Binary Relations

\between	<code>\between</code>	$ $	<code>\divides</code>	$=.$	<code>\risingdotseq</code>
\botdoteq	<code>\botdoteq</code>	\div	<code>\dotseq</code>	\approx	<code>\succapprox</code>
\Bumpedeq	<code>\Bumpedeq</code>	\div	<code>\eqbumped</code>	\geq	<code>\succcurlyeq</code>
\bumpedeq	<code>\bumpedeq</code>	\equiv	<code>\eqcirc</code>	$>$	<code>\succdot</code>
\circeq	<code>\circeq</code>	\equiv	<code>\eqcolon</code>	\gtrsim	<code>\succsim</code>
\coloneq	<code>\coloneq</code>	$\equiv.$	<code>\fallingdotseq</code>	\therefore	<code>\therefore</code>
\corresponds	<code>\corresponds</code>	\ggcurly		\doteq	<code>\topdoteq</code>
\curlyeqprec	<code>\curlyeqprec</code>	\llcurly		\vdash	<code>\vDash</code>
\curlyeqsucc	<code>\curlyeqsucc</code>	\approx	<code>\precapprox</code>	\nvDash	<code>\Vdash</code>
\DashV	<code>\DashV</code>	\approx	<code>\preccurlyeq</code>	\nVdash	<code>\VDash</code>
\Dashv	<code>\Dashv</code>	\lessdot	<code>\precdot</code>	\nVdash	<code>\Vdash</code>
\dashVv	<code>\dashVv</code>	\lesssim	<code>\precsim</code>	\nVdash	<code>\Vdash</code>

TABLE 96: mathabx Negated Binary Relations

$\not\approx$	<code>\napprox</code>	$\not\perp$	<code>\notperp</code>	$\not\nDash$	<code>\nvDash</code>
$\not\cong$	<code>\ncong</code>	$\not\prec$	<code>\prec</code>	$\not\nVDash$	<code>\nVDash</code>
$\not\curlyeqprec$	<code>\curlyeqprec</code>	$\not\precapprox$	<code>\precapprox</code>	$\not\nDash$	<code>\nDash</code>
$\not\curlyeqsucc$	<code>\curlyeqsucc</code>	$\not\preccurlyeq$	<code>\preccurlyeq</code>	$\not\nvDash$	<code>\nvDash</code>
$\not\dashv$	<code>\dashv</code>	$\not\preceq$	<code>\preceq</code>	$\not\nVdash$	<code>\nVdash</code>
$\not\dashV$	<code>\dashV</code>	$\not\precsim$	<code>\precsim</code>	$\not\precapprox$	<code>\precapprox</code>
$\not\dashv$	<code>\dashv</code>	$\not\simeq$	<code>\simeq</code>	$\not\precneq$	<code>\precneq</code>
$\not\dashV$	<code>\dashV</code>	$\not\simeq$	<code>\simeq</code>	$\not\precnsim$	<code>\precnsim</code>
$\not\dashVv$	<code>\dashVv</code>	$\not\succ$	<code>\succ</code>	$\not\precnapprox$	<code>\precnapprox</code>
$\not\eq$	<code>\eq</code>	$\not\succapprox$	<code>\succapprox</code>	$\not\precneq$	<code>\precneq</code>
$\not\asymp$	<code>\asymp</code>	$\not\succcurlyeq$	<code>\succcurlyeq</code>	$\not\precnsim$	<code>\precnsim</code>
$\not\divides$	<code>\divides</code>	$\not\succeq$	<code>\succeq</code>	$\not\precnapprox$	<code>\precnapprox</code>
$\not\equiv$	<code>\equiv</code>	$\not\succsim$	<code>\succsim</code>	$\not\precneq$	<code>\precneq</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 \neq b\$” or “\$a \not\equiv b\$”.

TABLE 97: MnSymbol Binary Relations

\approx	<code>\approx</code>	\doteq	<code>\hateq</code>	\propto	<code>\rightproto</code>
\approx_1	<code>\approxeq</code>	\times	<code>\hcrossing</code>	\triangleright	<code>\rightslice</code>
\lessapprox	<code>\backapprox</code>	\vdash	<code>\leftfootline</code>	\Vdash	<code>\rightVdash</code>
\lessapprox_1	<code>\backapproxeq</code>	\leftarrow	<code>\leftfree</code>	\vdash	<code>\rightvDash</code>
\lessapprox_2	<code>\backcong</code>	\equiv	<code>\leftmodels</code>	\doteqdot	<code>\risingdotseq</code>
\lessapprox_3	<code>\backeqsim</code>	\nparallel	<code>\leftModels</code>	\swarrow	<code>\sefootline</code>
\lessapprox_4	<code>\backsimeq</code>	\propto	<code>\leftproto</code>	\nearrow	<code>\sefree</code>
\lessapprox_5	<code>\backsimeq</code>	\mid	<code>\leftrightline</code>	\lessapprox	<code>\seModels</code>
\lessapprox_6	<code>\backtriplesim</code>	$=$	<code>\Leftrightline</code>	\lessapprox	<code>\semmodels</code>
\between		\triangleleft	<code>\leftslice</code>	\circ	<code>\separated</code>
\simeq	<code>\bump</code>	\dashv	<code>\leftVdash</code>	\lessapprox	<code>\seVdash</code>
\simeq_1	<code>\Bump</code>	\dashv	<code>\leftvDash</code>	\wedge	<code>\sevDash</code>
\simeq_2	<code>\circeq</code>	\nearrow	<code>\nefootline</code>	\parallel	<code>\shortparallel</code>
\simeq_3	<code>\closeddequal</code>	\nearrow	<code>\nefree</code>	\sim	<code>\sim</code>
\simeq_4	<code>\closedprec</code>	\lessapprox	<code>\neModels</code>	\simeq	<code>\simeq</code>
\simeq_5	<code>\closedsucc</code>	\lessapprox	<code>\nemodels</code>	\succ	<code>\succ</code>
\simeq_6	<code>\colonreq</code>	\nearrow	<code>\neswline</code>	\approx	<code>\succapprox</code>
\simeq_7	<code>\cong</code>	\lessapprox	<code>\Neswline</code>	\approx	<code>\succcurlyeq</code>
\simeq_8	<code>\curlyeqprec</code>	\lessapprox	<code>\nevDash</code>	\geq	<code>\succeq</code>
\simeq_9	<code>\curlyeqsucc</code>	\times	<code>\nevDash</code>	\geq	<code>\succsim</code>
\simeq_{10}	<code>\Doteq</code>	\nwarrow	<code>\nwfootline</code>	\checkmark	<code>\swfootline</code>
\simeq_{11}	<code>\doteq</code>	\nwarrow	<code>\nwfree</code>	\checkmark	<code>\swfree</code>
\downarrow	<code>\downfootline</code>	\gg	<code>\nwmodels</code>	\lessapprox	<code>\swModels</code>
\downarrow	<code>\downfree</code>	\gg	<code>\nwModels</code>	\lessapprox	<code>\swmodels</code>
\Downarrow	<code>\downmodels</code>	\dagger	<code>\nwsecrossing</code>	\lessapprox	<code>\swVdash</code>
\Downarrow	<code>\downModels</code>	\lessapprox	<code>\Nwseline</code>	\nearrow	<code>\swvDash</code>
\Downarrow	<code>\downproto</code>	\nwarrow	<code>\nwseline</code>	\approx	<code>\triplesim</code>
\Downarrow	<code>\downvDash</code>	\nearrow	<code>\nwvDash</code>	\mid	<code>\updownline</code>
\Downarrow	<code>\downVdash</code>	\gg	<code>\nwVdash</code>	\parallel	<code>\Updownline</code>
\downdownarrows	<code>\eqbump</code>	\prec		\top	<code>\upfootline</code>
\downdownarrows	<code>\eqcirc</code>	\approx	<code>\precapprox</code>	\uparrow	<code>\upfree</code>
\downdownarrows	<code>\eqdot</code>	\approx	<code>\preccurlyeq</code>	\equiv	<code>\upModels</code>
\downdownarrows	<code>\eqsim</code>	\leq	<code>\preceq</code>	\perp	<code>\upmodels</code>
\downdownarrows	<code>\equal</code>	\geq	<code>\precsim</code>	\otimes	<code>\upproto</code>
\downdownarrows	<code>\equalclosed</code>	\vdash	<code>\rightfootline</code>	\perp	<code>\upvDash</code>
\downdownarrows	<code>\equiv</code>	\rightarrow	<code>\rightfree</code>	\perp	<code>\upVdash</code>
\downdownarrows	<code>\equivclosed</code>	\vDash	<code>\rightmodels</code>	\times	<code>\vcrossing</code>
\downdownarrows	<code>\fallingdotseq</code>	\vDash	<code>\rightModels</code>	\Vdash	<code>\VvDash</code>

MnSymbol additionally defines synonyms for some of the preceding symbols:

\dashv	<code>\dashv</code>	(same as <code>\leftvdash</code>)
\backslash	<code>\diagdown</code>	(same as <code>\nwsepline</code>)
$/$	<code>\diagup</code>	(same as <code>\neswline</code>)
\diagup	<code>\divides</code>	(same as <code>\updownline</code>)
\div	<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>\leftproto</code>)
\relbar	<code>\relbar</code>	(same as <code>\leftrightline</code>)
\Relbar	<code>\Relbar</code>	(same as <code>\Leftrightline</code>)
\varpropto	<code>\varpropto</code>	(same as <code>\leftproto</code>)
\vDash	<code>\vDash</code>	(same as <code>\rightmodels</code>)
\VDash	<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 98: MnSymbol Negated Binary Relations

\approx	<code>\napprox</code>	$\not\vdash$	<code>\nleftfootline</code>	\neq	<code>\nrisingdotseq</code>
$\not\approx$	<code>\napproxeq</code>	$\not\vdash$	<code>\nleftfree</code>	\asymp	<code>\nsefootline</code>
$\not\approx$	<code>\backslashapprox</code>	$\not\vdash$	<code>\nleftmodels</code>	\asymp	<code>\nsefree</code>
$\not\approx$	<code>\backslashapproxeq</code>	$\not\vdash$	<code>\nleftModels</code>	$\not\asymp$	<code>\nseModels</code>
$\not\approx$	<code>\backslashbackcong</code>	$\not\vdash$	<code>\nleftrightline</code>	$\not\asymp$	<code>\nsemmodels</code>
$\not\approx$	<code>\backslashbackeqsim</code>	$\not\vdash$	<code>\nLeftrightline</code>	$\not\asymp$	<code>\nsevdash</code>
$\not\approx$	<code>\backslashbacksim</code>	$\not\vdash$	<code>\nleftvdash</code>	$\not\asymp$	<code>\nseVdash</code>
$\not\approx$	<code>\backslashbacksimeq</code>	$\not\vdash$	<code>\nleftVdash</code>	$\not\asymp$	<code>\nshortmid</code>
$\not\approx$	<code>\backslashbacktriplesim</code>	$\not\asymp$	<code>\nnefootline</code>	$\not\asymp$	<code>\nshortparallel</code>
$\not\approx$	<code>\bumpeq</code>	$\not\asymp$	<code>\nnefree</code>	$\not\asymp$	<code>\nsim</code>
$\not\approx$	<code>\Bumpeq</code>	$\not\asymp$	<code>\nnemodels</code>	$\not\asymp$	<code>\nsimeq</code>
$\not\approx$	<code>\circeq</code>	$\not\asymp$	<code>\nneModels</code>	$\not\asymp$	<code>\nsucc</code>
$\not\approx$	<code>\closedequal</code>	$\not\asymp$	<code>\nneswline</code>	$\not\asymp$	<code>\nsuccapprox</code>
$\not\approx$	<code>\cong</code>	$\not\asymp$	<code>\nNeswline</code>	$\not\asymp$	<code>\nsucccurlyeq</code>
$\not\approx$	<code>\curlyeqprec</code>	$\not\asymp$	<code>\nneVdash</code>	$\not\asymp$	<code>\nsucceq</code>
$\not\approx$	<code>\curlyeqsucc</code>	$\not\asymp$	<code>\nnevDash</code>	$\not\asymp$	<code>\nsuccsim</code>
$\not\approx$	<code>\doteq</code>	$\not\asymp$	<code>\nnwfootline</code>	$\not\asymp$	<code>\nswfootline</code>
$\not\approx$	<code>\Doteq</code>	$\not\asymp$	<code>\nnwfree</code>	$\not\asymp$	<code>\nswfree</code>
$\not\approx$	<code>\downfootline</code>	$\not\asymp$	<code>\nnwmodels</code>	$\not\asymp$	<code>\nswModels</code>
$\not\approx$	<code>\downfree</code>	$\not\asymp$	<code>\nnwModels</code>	$\not\asymp$	<code>\nswmodels</code>
$\not\approx$	<code>\downModels</code>	$\not\asymp$	<code>\nNseline</code>	$\not\asymp$	<code>\nswdash</code>
$\not\approx$	<code>\downmodels</code>	$\not\asymp$	<code>\nnwsepline</code>	$\not\asymp$	<code>\nswVdash</code>
$\not\approx$	<code>\downVdash</code>	$\not\asymp$	<code>\nnwvdash</code>	$\not\asymp$	<code>\ntriplesim</code>
$\not\approx$	<code>\downvdash</code>	$\not\asymp$	<code>\nnwVdash</code>	$\not\asymp$	<code>\nUpdownline</code>
$\not\approx$	<code>\eqbump</code>	$\not\asymp$	<code>\npref</code>	$\not\asymp$	<code>\nupdownline</code>
$\not\approx$	<code>\eqcirc</code>	$\not\asymp$	<code>\precapprox</code>	$\not\asymp$	<code>\nupfootline</code>
$\not\approx$	<code>\eqdot</code>	$\not\asymp$	<code>\preccurlyeq</code>	$\not\asymp$	<code>\nupfree</code>
$\not\approx$	<code>\eqsim</code>	$\not\asymp$	<code>\preceq</code>	$\not\asymp$	<code>\nupModels</code>

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\neq	<code>\nequal</code>	$\not\equiv$	<code>\nprecsim</code>	\nparallel	<code>\nupmodels</code>
$\not\equiv$	<code>\nequalclosed</code>	\dashv	<code>\nrightfootline</code>	\nparallel	<code>\nupVdash</code>
$\not\equiv$	<code>\nequiv</code>	\dashv	<code>\nrightfree</code>	\pm	<code>\nupvdash</code>
$\not\equiv$	<code>\nequivclosed</code>	\nparallel	<code>\nrightModels</code>	\approx	<code>\precnapprox</code>
$\not\parallel$	<code>\neswcrossing</code>	$\#$	<code>\nrightmodels</code>	\approx	<code>\precnsim</code>
$\not\approx$	<code>\nfallingdotseq</code>	\vdash	<code>\nrightvdash</code>	\succ	<code>\succnapprox</code>
$\not\approx$	<code>\nhateq</code>	\nparallel	<code>\nrightVdash</code>	\succ	<code>\succnsim</code>

MnSymbol additionally defines synonyms for some of the preceding symbols:

$\not\parallel$	<code>\ndashv</code>	(same as <code>\nleftvdash</code>)
\times	<code>\ndiagdown</code>	(same as <code>\nnwsepline</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>)
$\not\equiv$	<code>\nmodels</code>	(same as <code>\nrightmodels</code>)
$\not\parallel$	<code>\nparallel</code>	(same as <code>\nUpdownline</code>)
\pm	<code>\nperp</code>	(same as <code>\nupvdash</code>)
\dagger	<code>\nrelbar</code>	(same as <code>\nleftrightline</code>)
$\not\equiv$	<code>\nRelbar</code>	(same as <code>\nLeftrightline</code>)
$\not\equiv$	<code>\nvDash</code>	(same as <code>\nrightmodels</code>)
\vdash	<code>\nvDash</code>	(same as <code>\nrightvdash</code>)
\nparallel	<code>\nVdash</code>	(same as <code>\nrightVdash</code>)
\nparallel	<code>\nVDash</code>	(same as <code>\nrightModels</code>)

TABLE 99: fdsymbol Binary Relations

\approx	<code>\approx</code>	\equiv	<code>\equiv</code>	\models	<code>\rightmodels</code>
\approx	<code>\approxeq</code>	\doteq	<code>\fallingdotseq</code>	\Vdash	<code>\rightVdash</code>
\lessapprox	<code>\backcong</code>	\sim	<code>\frown</code>	\Vdash	<code>\rightVDash</code>
\gtrapprox	<code>\backproto</code>	\cong	<code>\frownreq</code>	\vdash	<code>\rightvdash</code>
\sim	<code>\backsimeq</code>	\circ	<code>\frownsmile</code>	\models	<code>\rightvDash</code>
\lessapprox	<code>\backsimeq</code>	\in	<code>\in</code>	\doteq	<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>
\simeq	<code>\bumpeq</code>	\vdash	<code>\leftfootline</code>	\sim	<code>\sim</code>
\simeq	<code>\Bumpeq</code>	\dashv	<code>\leftmodels</code>	\approx	<code>\simeq</code>
\cong	<code>\bumpeqq</code>	\dashv	<code>\leftvdash</code>	\sim	<code>\smile</code>
\cong	<code>\circeq</code>	\dashv	<code>\leftvDash</code>	\approx	<code>\smileeq</code>
\coloneqq	<code>\coloneq</code>	\dashv	<code>\leftVdash</code>	\asymp	<code>\smilefrown</code>
\cong	<code>\cong</code>	\dashv	<code>\leftVDash</code>	\ast	<code>\stareq</code>
\times	<code>\crossing</code>	\dashv	<code>\longleftfootline</code>	$>$	<code>\succ</code>

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\approx	<code>\curlyeqprec</code>	\Leftarrow	<code>\Longmapsfrom</code>	\approx	<code>\succapprox</code>
\approxeq	<code>\curlyeqsucc</code>	\Leftarrow	<code>\longmapsfrom</code>	\approx	<code>\succcurlyeq</code>
$\dashv v$	<code>\dashVv</code>	\longrightarrow	<code>\longrightfootline</code>	\succeq	<code>\succeq</code>
\equiv	<code>\Dashhv</code>	$ $	<code>\mid</code>	\succeqq	<code>\succeqq</code>
\dotcong	<code>\dotcong</code>	\ni	<code>\owns</code>	\succsim	<code>\succsim</code>
\doteq	<code>\doteq</code>	\parallel	<code>\parallel</code>	\thickapprox	<code>\thickapprox</code>
\Doteq	<code>\Doteq</code>	\wedge	<code>\prec</code>	\thicksim	<code>\thicksim</code>
\dotsminusdots	<code>\dotsminusdots</code>	\approx	<code>\precapprox</code>	\triplesim	<code>\triplesim</code>
\downAssert	<code>\downAssert</code>	\nwarrow	<code>\preccurlyeq</code>	\upassert	<code>\upassert</code>
\downassert	<code>\downassert</code>	\nwarrow	<code>\preceq</code>	\upAssert	<code>\upAssert</code>
\downmodels	<code>\downmodels</code>	\nwarrow	<code>\preceqq</code>	\upmodels	<code>\upmodels</code>
\downvDash	<code>\downvDash</code>	\nwarrow	<code>\precnapprox</code>	\upvDash	<code>\upvDash</code>
\downVdash	<code>\downVdash</code>	\nwarrow	<code>\precneq</code>	\upvDash	<code>\upvDash</code>
\downvDash	<code>\downvDash</code>	\nwarrow	<code>\precneqq</code>	\upVdash	<code>\upVdash</code>
\downVDash	<code>\downVDash</code>	\nwarrow	<code>\precnsim</code>	\upVDash	<code>\upVDash</code>
\eqcirc	<code>\eqcirc</code>	\approx	<code>\precsim</code>	\vDash	<code>\vDash</code>
\eqcolon	<code>\eqcolon</code>	\propto	<code>\propto</code>	\veeeq	<code>\veeeq</code>
\eqdot	<code>\eqdot</code>	\vdash	<code>\rightassert</code>	\Vdash	<code>\Vdash</code>
\eqsim	<code>\eqsim</code>	\Vdash	<code>\rightAssert</code>	\wedgeq	<code>\wedgeq</code>
$=$	<code>\equal</code>	\rightarrow	<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>	\eqcolon	<code>\eqcolon</code>	\smallfrown	<code>\smallfrown</code>
\vdash	<code>\assert</code>	\hateq	<code>\hateq</code>	\smallsmile	<code>\smallsmile</code>
\asymp	<code>\asymp</code>	\Join	<code>\Join</code>	\varpropto	<code>\varpropto</code>
\Barv	<code>\Barv</code>	\longdashv	<code>\longdashv</code>	\vBar	<code>\vBar</code>
\barV	<code>\barV</code>	\models	<code>\models</code>	\Vbar	<code>\Vbar</code>
\circ	<code>\closure</code>	\ni	<code>\ni</code>	\vDash	<code>\vDash</code>
\coloneqq	<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>	\Vdash	<code>\Vdash</code>

TABLE 100: *fdsymbol* Negated Binary Relations

$\not\approx$	<code>\backsimneqq</code>	\notin	<code>\nin</code>	\nexists	<code>\nsim</code>
$\not\approx$	<code>\napprox</code>	\nparallel	<code>\nleftAssert</code>	$\not\approx$	<code>\nsimeq</code>
$\not\approx$	<code>\napproxeq</code>	\nparallel	<code>\nleftassert</code>	\nexists	<code>\nsmile</code>
$\not\approx$	<code>\nbackcong</code>	\nparallel	<code>\nleftfootline</code>	$\not\approx$	<code>\nsmileeq</code>
\nexists	<code>\nbacksim</code>	\nparallel	<code>\nleftmodels</code>	$\not\approx$	<code>\nsmilefrown</code>
$\not\approx$	<code>\nbacksimeq</code>	\nparallel	<code>\nleftvDash</code>	$\not\approx$	<code>\nstareq</code>
$\not\approx$	<code>\nbumppeq</code>	\nparallel	<code>\nleftvdash</code>	\nexists	<code>\nsucc</code>
$\not\approx$	<code>\nBumpeq</code>	\nparallel	<code>\nleftVdash</code>	$\not\approx$	<code>\nsuccapprox</code>
$\not\approx$	<code>\nbumpeqq</code>	\nparallel	<code>\nleftVDash</code>	$\not\approx$	<code>\nsucccurlyeq</code>
$\not\approx$	<code>\ncirceq</code>	\nparallel	<code>\nlongleftfootline</code>	$\not\approx$	<code>\nsucceq</code>
$\not\approx$	<code>\ncong</code>	\nparallel	<code>\nLongmapsfrom</code>	$\not\approx$	<code>\nsucceqq</code>
$\not\approx$	<code>\ncurlyeqprec</code>	\nparallel	<code>\nlongmapsfrom</code>	$\not\approx$	<code>\nsuccsim</code>
$\not\approx$	<code>\ncurlyeqsucc</code>	\nparallel	<code>\nlongrightfootline</code>	$\not\approx$	<code>\ntriplesim</code>
\nparallel	<code>\ndashVv</code>	\nmid	<code>\nmid</code>	\nexists	<code>\nupassert</code>
\nparallel	<code>\Ddashv</code>	\nmid	<code>\nowns</code>	\nexists	<code>\nupAssert</code>
$\not\approx$	<code>\ndoteq</code>	\nparallel	<code>\nparallel</code>	\nexists	<code>\nupmodels</code>
$\not\approx$	<code>\Doteq</code>	\nmid	<code>\nprec</code>	\nexists	<code>\nupVDash</code>
\nexists	<code>\downassert</code>	\nmid	<code>\nprecapprox</code>	\nexists	<code>\nupvDash</code>
\nexists	<code>\downAssert</code>	\nmid	<code>\npreccurlyeq</code>	\nexists	<code>\nupVdash</code>
\nexists	<code>\downmodels</code>	\nmid	<code>\npreceq</code>	\nexists	<code>\nupvdash</code>
\nexists	<code>\downvdash</code>	\nmid	<code>\npreceqq</code>	\nexists	<code>\nvDash</code>
\nexists	<code>\downVdash</code>	\nmid	<code>\nprecsim</code>	\nexists	<code>\nveeeq</code>
\nexists	<code>\downVDash</code>	\nmid	<code>\nrightassert</code>	\nparallel	<code>\nVdash</code>
\nexists	<code>\downnvDash</code>	\nparallel	<code>\nrightAssert</code>	\nexists	<code>\nwedgeq</code>
$\not\approx$	<code>\neqcirc</code>	\nparallel	<code>\nrightfootline</code>	$\not\approx$	<code>\precneq</code>
$\not\approx$	<code>\neqdot</code>	\nparallel	<code>\nrightmodels</code>	$\not\approx$	<code>\precneqq</code>
$\not\approx$	<code>\eqsim</code>	\nparallel	<code>\nrightvDash</code>	$\not\approx$	<code>\simneqq</code>
$\not\approx$	<code>\nequal</code>	\nparallel	<code>\nrightVdash</code>	\nexists	<code>\succnapprox</code>
$\not\approx$	<code>\nequiv</code>	\nparallel	<code>\nrightvDash</code>	\nexists	<code>\succneq</code>
$\not\approx$	<code>\nfallingdotseq</code>	\nparallel	<code>\nrightVDash</code>	$\not\approx$	<code>\succneqq</code>
\nexists	<code>\nfrown</code>	\nmid	<code>\nrisingdotseq</code>	\nexists	<code>\succnsim</code>
$\not\approx$	<code>\nfrownneq</code>	\nmid	<code>\nshortmid</code>	\nexists	<code>\succnsim</code>
$\not\approx$	<code>\nfrownsmile</code>	\nmid	<code>\nshortparallel</code>		

fdsymbol defines synonyms for many of the preceding symbols:

$\not\approx$	<code>\napproxident</code>	\nparallel	<code>\ndashV</code>	\nparallel	<code>\nshortrighttack</code>
$\not\approx$	<code>\narceq</code>	$\not\approx$	<code>\ne</code>	\nexists	<code>\nshortuptack</code>
\nparallel	<code>\nAssert</code>	$\not\approx$	<code>\neq</code>	\nexists	<code>\nsime</code>
\nparallel	<code>\nassert</code>	$\not\approx$	<code>\nhateq</code>	\nexists	<code>\nvBar</code>
$\not\approx$	<code>\nasmp</code>	\nparallel	<code>\nlongdashv</code>	\nparallel	<code>\nVbar</code>
\nexists	<code>\nBarv</code>	$\not\approx$	<code>\nmodels</code>	\nparallel	<code>\nDash</code>
\nexists	<code>\nbarV</code>	$\not\approx$	<code>\nni</code>	$\not\approx$	<code>\nvDash</code>
$\not\approx$	<code>\nclosure</code>	$\not\approx$	<code>\notinin</code>	\nparallel	<code>\nVDash</code>
\nparallel	<code>\nDashV</code>	\nexists	<code>\nperp</code>	\nparallel	<code>\nvDash</code>
\nparallel	<code>\nDashv</code>	\nexists	<code>\nshortdowntack</code>	\nparallel	<code>\nvlongdash</code>
\nparallel	<code>\ndashv</code>	\nmid	<code>\nshortlefttack</code>		

TABLE 101: boisik Binary Relations

\approx	$\backslash ac$	$\mathbin{\!/\mkern-5mu/\!}$	$\backslash fatslash$	\succcurlyeq	$\backslash scurel$
\approx	$\backslash approxeq$	\cap	$\backslash forkv$	\vdash	$\backslash shortmid$
\trianglelefteq	$\backslash arceq$	$)$	$\backslash frown$	\parallel	$\backslash shortparallel$
\triangleleft	$\backslash backsim$	\gg	$\backslash ggcurly$	\approx	$\backslash simrdots$
\triangleleft	$\backslash backsimeq$	$\#$	$\backslash hash$	\sim	$\backslash smallfrown$
\sqsubseteq	$\backslash bagmember$	\in	$\backslash inplus$	\sim	$\backslash smallsmile$
\because	$\backslash because$	\approx	$\backslash kernelcontraction$	\smile	$\backslash smile$
\between	$\backslash between$	\llcorner	$\backslash llcurly$	\vdash	$\backslash strictfi$
\trianglelefteq	$\backslash bumpeq$	\multimap	$\backslash multimap$	\rightarrow	$\backslash strictif$
\trianglelefteq	$\backslash Bumpeq$	$\multimap both$	$\backslash multimapboth$	\approx	$\backslash succapprox$
\circlearrowleft	$\backslash circeq$	$\multimap both vert$	$\backslash multimapbothvert$	\approx	$\backslash succcurlyeq$
\circlearrowleft	$\backslash CircledEq$	$\multimap dot$	$\backslash multimapdot$	\approx	$\backslash succnapprox$
\cong	$\backslash cong$	$\multimap both$	$\backslash multimapdotboth$	\approx	$\backslash succneqq$
\cong	$\backslash corresponds$	$\multimap both A$	$\backslash multimapdotbothA$	\approx	$\backslash succnsim$
\approx	$\backslash curlyeqprec$	$\multimap both Avert$	$\backslash multimapdotbothAvert$	\approx	$\backslash succsim$
\approx	$\backslash curlyeqsucc$	$\multimap both B$	$\backslash multimapdotbothB$	\therefore	$\backslash therefore$
\dashv	$\backslash dashV$	$\multimap both Bvert$	$\backslash multimapdotbothBvert$	\approx	$\backslash thickapprox$
\dashv	$\backslash DashV$	$\multimap both vert$	$\backslash multimapdotbothvert$	\sim	$\backslash thicksim$
\dashv	$\backslash dashVv$	$\multimap dotinv$	$\backslash multimapdotinv$	\top	$\backslash topfork$
\approx	$\backslash dfourier$	$\multimap inv$	$\backslash multimapinv$	\trianglelefteq	$\backslash triangleq$
\approx	$\backslash Dfourier$	$\ni plus$	$\backslash niplus$	$\#$	$\backslash varhash$
\in	$\backslash disin$	$\ni sd$	$\backslash nisd$	\in	$\backslash varisins$
\doteq	$\backslash doteq$	\perp	$\backslash Perp$	\exists	$\backslash varnis$
\doteq	$\backslash doteqdot$	\pitchfork	$\backslash pitchfork$	\propto	$\backslash varproto$
\dotminus	$\backslash dotminus$	\precapprox	$\backslash precapprox$	\vdash	$\backslash Vdash$
\approx	$\backslash dotsim$	\preccurlyeq	$\backslash preccurlyeq$	\models	$\backslash vDash$
\approx	$\backslash eqbumped$	\precnapprox	$\backslash precnapprox$	\models	$\backslash VDash$
\approx	$\backslash eqcirc$	\precneqq	$\backslash precneqq$	\models	$\backslash veeq$
\approx	$\backslash eqsim$	\precnsim	$\backslash precnsim$	\models	$\backslash Vvdash$
\approx	$\backslash equalparallel$	\precsim	$\backslash precsim$	\approx	$\backslash ztransf$
\approx	$\backslash fallingdotseq$	\prurel	$\backslash prurel$	\approx	$\backslash Ztransf$
\approx	$\backslash fatbslash$	\risingdotseq	$\backslash risingdotseq$		

TABLE 102: boisik Negated Binary Relations

$\not\approx$	$\backslash ncong$	$\not\preceq$	$\backslash npreceq$	$\not\models$	$\backslash nVDash$
\neq	$\backslash neq$	\vdash	$\backslash nshortmid$	$\not\models$	$\backslash nVdash$
\neq	$\backslash nequiv$	\parallel	$\backslash nshortparallel$	$\not\models$	$\backslash nvDash$
\vdash	$\backslash nmid$	\approx	$\backslash nsim$	$\not\models$	$\backslash nvDash$
\parallel	$\backslash nparallel$	\times	$\backslash nsucc$		
\neq	$\backslash nprec$	$\not\approx$	$\backslash nsucceq$		

TABLE 103: stix Binary Relations

\approx	<code>\approxprox</code>	$\#$	<code>\eqvparsl</code>	\rightarrow	<code>\rightfishetail</code>
\approxeq	<code>\approxeq</code>	.	<code>\fallingdotseq</code>	\sqcup	<code>\rightimply</code>
\approxeqq	<code>\approxeqq</code>	\blacktriangleright	<code>\fbowtie</code>	\succ	<code>\righttail</code>
\approxprox	<code>\approxprox</code>	\downarrow	<code>\forksnot</code>	\sqsupseteq	<code>\risingdotseq</code>
\arceq	<code>\arceq</code>	\cap	<code>\forkv</code>	\sqsubset	<code>\rsqhook</code>
\vdash	<code>\assert</code>	$)$	<code>\frown</code>	\Rightarrow	<code>\ruledelayed</code>
\asteq	<code>\asteq</code>	\mathbb{H}	<code>\gleichstark</code>	\sucr	<code>\scurel</code>
\asymp	<code>\asymp</code>	\approx	<code>\hatapprox</code>	\shortdowntack	<code>\shortdowntack</code>
\backcong	<code>\backcong</code>	$\bullet\circ$	<code>\imageof</code>	\shortlefttack	<code>\shortlefttack</code>
\backsimeq	<code>\backsimeq</code>	\in	<code>\in</code>	\shortmid	<code>\shortmid</code>
\backsimeq	<code>\backsimeq</code>	$\dot{\in}$	<code>\isindot</code>	\shortparallel	<code>\shortparallel</code>
\bagmember	<code>\bagmember</code>	$\in\!\in$	<code>\isinE</code>	\shortuparrow	<code>\shortuparrow</code>
\barv	<code>\barv</code>	$\in\!\in\!\in$	<code>\isinobar</code>	\sim	<code>\sim</code>
\barV	<code>\barV</code>	$\in\!\in\!\in\!\in$	<code>\isins</code>	\simeq	<code>\simeq</code>
\between	<code>\between</code>	$\in\!\in\!\in\!\in\!\in$	<code>\isinvb</code>	\approx	<code>\simminussim</code>
\bNot	<code>\bNot</code>	\approx	<code>\kernelcontraction</code>	$\not\approx$	<code>\simneqq</code>
\bowtie	<code>\bowtie</code>	\leftarrow	<code>\leftdbltail</code>	\approx	<code>\simrdots</code>
\Bumpeq	<code>\Bumpeq</code>	\leftarrow	<code>\leftfishetail</code>	\smallfrown	<code>\smallfrown</code>
\bumpeq	<code>\bumpeq</code>	\leftarrow	<code>\lefttail</code>	\smallin	<code>\smallin</code>
\bumpeqq	<code>\bumpeqq</code>	\blacktriangleright	<code>\lfbowtie</code>	\smallni	<code>\smallni</code>
\cirbot	<code>\cirbot</code>	\blacktriangleright	<code>\lftimes</code>	\smallsmile	<code>\smallsmile</code>
\circeq	<code>\circeq</code>	$\overline{[]}$	<code>\longdashv</code>	$\#\,$	<code>\smeparsl</code>
\cirmid	<code>\cirmid</code>	$\overline{[]}$	<code>\lsqhook</code>	$(\,$	<code>\smile</code>
\closure	<code>\closure</code>	$\overline{[]}$	<code>\measeq</code>	\star	<code>\stareq</code>
\Coloneq	<code>\Coloneq</code>	$-$	<code>\mid</code>	\succ	<code>\succ</code>
\coloneq	<code>\coloneq</code>	\circ	<code>\midcir</code>	\gg	<code>\Succ</code>
\cong	<code>\cong</code>	\pitchfork	<code>\mlcp</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succapprox</code>
\congdot	<code>\congdot</code>	\models	<code>\models</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succcurlyeq</code>
\curlyeqprec	<code>\curlyeqprec</code>	$\circ\circ$	<code>\multimap</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succeq</code>
\curlyeqsucc	<code>\curlyeqsucc</code>	$\circ\circ$	<code>\multimapinv</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succeqq</code>
\dashcolon	<code>\dashcolon</code>	\exists	<code>\ni</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succnapprox</code>
\dashv	<code>\dashv</code>	\exists	<code>\niobar</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succneq</code>
\dashV	<code>\dashV</code>	\exists	<code>\nis</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succneqq</code>
\Dashv	<code>\Dashv</code>	\exists	<code>\nisd</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succnsm</code>
\DashV	<code>\DashV</code>	\models	<code>\Not</code>	$\approx\approx\approx\approx\approx\approx$	<code>\succsim</code>
\DashVDash	<code>\DashVDash</code>	$/$	<code>\notchar</code>	\approx	<code>\thickapprox</code>
\dashVdash	<code>\dashVdash</code>	$\bullet\bullet$	<code>\origof</code>	\sim	<code>\thicksim</code>
$\ddot{}$	<code>\ddot{}</code>	\parallel	<code>\parallel</code>	\pitchfork	<code>\topfork</code>
\disin	<code>\disin</code>	$\#$	<code>\parsim</code>	\uparrow	<code>\upfishetail</code>
\Doteq	<code>\Doteq</code>	\perp	<code>\perp</code>	\uparrow	<code>\upin</code>
\doteq	<code>\doteq</code>	\pitchfork	<code>\pitchfork</code>	$\in\!\in$	<code>\varisinobar</code>
\dotequiv	<code>\dotequiv</code>	\wedge	<code>\prec</code>	$\in\!\in\!\in$	<code>\varisins</code>
\dotsim	<code>\dotsim</code>	$\approx\!\approx$	<code>\Prec</code>	\exists	<code>\varniobar</code>
\dotsminusdots	<code>\dotsminusdots</code>	$\approx\!\approx\!\approx$	<code>\precapprox</code>	Θ	<code>\varnis</code>
\downfishtail	<code>\downfishtail</code>	$\approx\!\approx\!\approx$	<code>\preccurlyeq</code>	α	<code>\varproto</code>
\dualmap	<code>\dualmap</code>	$\approx\!\approx\!\approx$	<code>\preceq</code>	\vdash	<code>\varVdash</code>
\eparsl	<code>\eparsl</code>	$\approx\!\approx\!\approx$	<code>\preceqq</code>	\pm	<code>\vBar</code>

(continued on next page)

(continued from previous page)

\models	<code>\eqcirc</code>	\approx	<code>\precnapprox</code>	$\perp\!\!\!\perp$	<code>\Vbar</code>
\coloneqq	<code>\eqcolon</code>	\asymp	<code>\precneq</code>	\doteqdot	<code>\vBarv</code>
$\stackrel{\text{def}}{=}$	<code>\eqdef</code>	$\asymp\asymp$	<code>\precneqq</code>	\vdash	<code>\Vdash</code>
\equiv	<code>\eqdot</code>	$\asymp\asymp$	<code>\precnsim</code>	\vdash	<code>\vdash</code>
$\equiv\equiv$	<code>\eqeqq</code>	$\asymp\asymp$	<code>\precsim</code>	\vDash	<code>\vDash</code>
$\equiv\equiv\equiv$	<code>\eqeqeqq</code>	\bowtie	<code>\proto</code>	\Vdash	<code>\VDash</code>
\eqqsim	<code>\eqqsim</code>	\bowtie	<code>\prurel</code>	\equiv	<code>\vDdash</code>
\eqsim	<code>\eqsim</code>	\sqsupset	<code>\pullback</code>	\vdots	<code>\vdots</code>
$\#$	<code>\equalparallel</code>	\sqsubset	<code>\pushout</code>	\leqq	<code>\veeeq</code>
\equiv	<code>\equiv</code>	$\frac{?}{=}$	<code>\questeq</code>	\bowtie	<code>\veeonwedge</code>
$\equiv\equiv$	<code>\Equiv</code>	\dagger	<code>\revnmid</code>	$ $	<code>\vertoverlay</code>
$\equiv\equiv\equiv$	<code>\equivDD</code>	$\bowtie\bowtie$	<code>\rfbowtie</code>	$\overline{ }$	<code>\vlongdash</code>
$\#$	<code>\equivVert</code>	$\bowtie\bowtie$	<code>\rftimes</code>	\Vdash	<code>\Vdash</code>
$\#$	<code>\equivVvert</code>	\rightarrowtail	<code>\rightdbltail</code>	\trianglelefteq	<code>\wedgeeq</code>

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

TABLE 104: stix Negated Binary Relations

$\not\models$	<code>\forks</code>	$\not\#$	<code>\nhpar</code>	$\not\approx$	<code>\nsime</code>
$\not\approx$	<code>\napprox</code>	$\not\dagger$	<code>\nmid</code>	$\not\star$	<code>\nsucc</code>
$\not\approx$	<code>\napproxeqq</code>	$\not\bowtie$	<code>\nni</code>	$\not\star$	<code>\nsucccurlyeq</code>
$\not\approx$	<code>\nasymp</code>	$\not\in$	<code>\notinin</code>	$\not\star$	<code>\nsucceq</code>
$\not\approx$	<code>\nBumpeq</code>	$\not\#$	<code>\nparallel</code>	$\not\#$	<code>\nvarisinobar</code>
$\not\approx$	<code>\nbumpseq</code>	$\not\star$	<code>\nprec</code>	$\not\bowtie$	<code>\nvarniobar</code>
$\not\approx$	<code>\ncong</code>	$\not\star$	<code>\npreccurlyeq</code>	$\not\bowtie$	<code>\nvDash</code>
$\not\approx$	<code>\ncongdot</code>	$\not\star$	<code>\npreceq</code>	$\not\bowtie$	<code>\nvDash</code>
$\not\approx$	<code>\ne</code>	\dagger	<code>\nshortmid</code>	$\not\bowtie$	<code>\nVDash</code>
$\not\approx$	<code>\neqsim</code>	$\not\#$	<code>\nshortparallel</code>	$\not\bowtie$	<code>\nVdash</code>
$\not\approx$	<code>\nequiv</code>	\sim	<code>\nsim</code>		

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

TABLE 105: mathtools Binary Relations

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

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

$$\begin{array}{c} \text{=:=:} \\ \text{``=:='''} \end{array} \quad \text{vs.} \quad \begin{array}{c} \text{=:=:} \\ \text{``=\vcentscolon=''} \end{array}$$

TABLE 106: turnstile Binary Relations

$\frac{def}{abc}$	$\backslash dddstile{abc}{def}$	$\frac{def}{abc}$	$\backslash nntstile{abc}{def}$	$\frac{def}{abc}$	$\backslash stdtstile{abc}{def}$
$\frac{def}{abc}$	$\backslash ddststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash nnttstile{abc}{def}$	$\frac{def}{abc}$	$\backslash stststile{abc}{def}$
$\frac{def}{abc}$	$\backslash ddtstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash nsdtstile{abc}{def}$	$\frac{def}{abc}$	$\backslash sttstile{abc}{def}$
$\frac{def}{abc} \parallel$	$\backslash ddttstile{abc}{def}$	$\frac{def}{abc}$	$\backslash nsststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash stttstile{abc}{def}$
$\frac{def}{abc} \parallel$	$\backslash dndtstile{abc}{def}$	$\frac{def}{abc}$	$\backslash nststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tddtstile{abc}{def}$
$\frac{def}{abc}$	$\backslash dnststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash nsttstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tdststile{abc}{def}$
$\frac{def}{abc}$	$\backslash dntstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ntdtstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tdtstile{abc}{def}$
$\frac{def}{abc} \parallel$	$\backslash dnttstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ntststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tdttstile{abc}{def}$
$\frac{def}{abc} \parallel$	$\backslash dsdtstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash nttstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tnntstile{abc}{def}$
$\frac{def}{abc}$	$\backslash dsststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ntttstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tnststile{abc}{def}$
$\frac{def}{abc}$	$\backslash dststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash sddtstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tntstile{abc}{def}$
$\frac{def}{abc} \parallel$	$\backslash dsttstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash sdststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tnnttstile{abc}{def}$
$\frac{def}{abc} \parallel$	$\backslash dtbstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash sdtstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tsdtstile{abc}{def}$
$\frac{def}{abc}$	$\backslash dtststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash sdttstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tsststile{abc}{def}$
$\frac{def}{abc}$	$\backslash dtbstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash sndtstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tststile{abc}{def}$
$\frac{def}{abc} \parallel$	$\backslash dtttstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash snststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ttttstile{abc}{def}$
$\frac{def}{abc}$	$\backslash nddtstile{abc}{def}$	$\frac{def}{abc}$	$\backslash sntstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ttbstile{abc}{def}$
$\frac{def}{abc}$	$\backslash ndststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash snntstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ttststile{abc}{def}$
$\frac{def}{abc}$	$\backslash ndtstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ssdtstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ttttstile{abc}{def}$
$\frac{def}{abc} \parallel$	$\backslash ndttstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash sssnstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash tttttstile{abc}{def}$
$\frac{def}{abc}$	$\backslash nnntstile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash sststile{abc}{def}$		
$\frac{def}{abc}$	$\backslash nnststile{abc}{def}$	$\frac{def}{abc} \parallel$	$\backslash ssttstile{abc}{def}$		

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 107: `trsym` Binary Relations

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

TABLE 108: `trfsigns` Binary Relations

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

TABLE 109: `cml` Binary Relations

$\circ\subsetneq$	<code>\coh</code>	$\supsetneq\circ$	<code>\scoh</code>
$\asymp\circ$	<code>\incoh</code>	$\supsetneq\circ$	<code>\sincoh</code>
$\perp\perp$	<code>\Perp</code>	$\perp\perp\supsetneq$	<code>\simperp</code>
$\circ\multimap$	<code>\multimapboth</code>		

TABLE 110: `colonequals` Binary Relations

$\approx:$	<code>\approxcolon</code>	$::-$	<code>\coloncolonminus</code>	$=::$	<code>\equalscoloncolon</code>
$\approx::$	<code>\approxcoloncoloncolon</code>	$::\sim$	<code>\coloncolon\sim</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>\colon\sim</code>	$\sim::$	<code>\simcolon</code>
$::=:$	<code>\coloncolon\colonequals</code>	$=::$	<code>\equalscolon</code>	$\sim::$	<code>\simcoloncolon</code>

TABLE 111: `fourier` Binary Relations

`\nparallelslant` // `\parallelslant`

TABLE 112: Subset and Superset Relations

\sqsubseteq	<code>\sqsubsetset</code> *	\sqsupseteq	<code>\sqsupsetset</code>	\supset	<code>\supset</code>
\sqsubseteq	<code>\sqsubsetseteq</code>	\subset	<code>\subset</code>	\supseteq	<code>\supseteq</code>
\sqsupseteq	<code>\sqsubsetset*</code>	\subseteq	<code>\subsetseteq</code>		

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

TABLE 113: *AMS* Subset and Superset Relations

$\not\subseteq$	$\backslash nsubseteq$	\subseteq	$\backslash subseteqq$	\supseteq	$\backslash supsetneqq$
$\not\supseteq$	$\backslash nsupseteq$	\subseteq	$\backslash subsetneq$	\supseteq	$\backslash varsubsetneq$
$\not\supseteqq$	$\backslash nsupseteqq$	\subseteq	$\backslash subsetneqq$	\supseteq	$\backslash varsubsetneqq$
\sqsubset	$\backslash sqsubset$	\sqsupseteq	$\backslash Supset$	\sqsupseteqq	$\backslash varsupsetneq$
\sqsupset	$\backslash sqsupset$	\sqsubseteq	$\backslash supseteqq$	\sqsupseteqq	$\backslash varsupsetneqq$
\Subset	$\backslash Subset$	\Supset	$\backslash supsetneq$		

TABLE 114: *stmaryrd* Subset and Superset Relations

\Subset	$\backslash subsetplus$	\Supset	$\backslash supsetplus$
\Subseteq	$\backslash subsetpluseq$	\Supseteq	$\backslash supsetpluseq$

TABLE 115: *wasysym* Subset and Superset Relations

\sqsubset	$\backslash sqsubset$	\sqsupset	$\backslash sqsupset$
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TABLE 116: *txfonts/pxfonts* Subset and Superset Relations

$\not\sqsubset$	$\backslash nsqsubset$	$\not\sqsupset$	$\backslash nsqsupseteq$	$\not\sqsupseteq$	$\backslash nSupset$
$\not\sqsubseteq$	$\backslash nsqsubseteq$	$\not\sqsupseteq$	$\backslash nSubset$		
$\not\sqsupset$	$\backslash nsqsupset$	$\not\sqsubseteq$	$\backslash nsubseteq$		

TABLE 117: *mathabx* Subset and Superset Relations

$\not\sqsubset$	$\backslash nsqsubset$	$\not\sqsupset$	$\backslash nsupset$	\sqsubseteq	$\backslash sqsupseteq$	\sqsupseteq	$\backslash supseteq$
$\not\sqsubset$	$\backslash nsqSubset$	$\not\sqsupset$	$\backslash nSupset$	\sqsubseteq	$\backslash sqsupseteqq$	\sqsupseteq	$\backslash supseteqq$
$\not\sqsubset$	$\backslash nsqsubseteq$	$\not\sqsupseteq$	$\backslash nsupseteq$	\sqsubseteq	$\backslash sqsupsetneq$	\sqsupseteq	$\backslash supsetneq$
$\not\sqsubset$	$\backslash nsqsubseteqq$	$\not\sqsupseteqq$	$\backslash nsupseteqq$	\sqsubseteq	$\backslash sqsupsetneqq$	\sqsupseteqq	$\backslash supsetneqq$
$\not\sqsupset$	$\backslash nsqsupset$	$\not\sqsubset$	$\backslash sqsubset$	\sqsubset	$\backslash subset$	\sqsupseteq	$\backslash varsqsubsetneq$
$\not\sqsupset$	$\backslash nsqSupset$	$\not\sqsubset$	$\backslash sqSubset$	\sqsubset	$\backslash Subset$	\sqsupseteq	$\backslash varsqsubsetneqq$
$\not\sqsupset$	$\backslash nsqsupseteq$	$\not\sqsubset$	$\backslash sqsubseteq$	\sqsubseteq	$\backslash subseteq$	\sqsupseteq	$\backslash varsqsupsetneq$
$\not\sqsupset$	$\backslash nsqsupseteqq$	$\not\sqsubset$	$\backslash sqsubseteqq$	\sqsubseteq	$\backslash subseteqq$	\sqsupseteqq	$\backslash varsqsupsetneqq$
$\not\sqsubset$	$\backslash nsubset$	$\not\sqsupset$	$\backslash sqsubsetneq$	\sqsubset	$\backslash subsetneq$	\sqsupseteq	$\backslash varsubsetneq$
$\not\sqsubset$	$\backslash nSubset$	$\not\sqsupset$	$\backslash sqsubsetneqq$	\sqsubset	$\backslash subsetneqq$	\sqsupseteq	$\backslash varsubsetneqq$
$\not\sqsubset$	$\backslash nsubseteq$	$\not\sqsupset$	$\backslash sqSupset$	\sqsupseteq	$\backslash supset$	\sqsupseteq	$\backslash varsupsetneq$
$\not\sqsubset$	$\backslash nsubseteqq$	$\not\sqsupset$	$\backslash sqSupset$	\sqsupseteq	$\backslash Supset$	\sqsupseteq	$\backslash varsupsetneqq$

TABLE 118: MnSymbol Subset and Superset Relations

$\not\models$	$\backslash nSqsubset$	$\not\models$	$\backslash nsubseteq$	$\not\models$	$\backslash sqsubsetneq$	\subseteq	$\backslash subseteq$
$\not\models$	$\backslash nsqsubset$	$\not\models$	$\backslash nsubseteqq$	$\not\models$	$\backslash sqsubsetneqq$	\subseteq	$\backslash subseteqq$
$\not\models$	$\backslash nsqsubseteq$	$\not\models$	$\backslash nSupset$	$\not\models$	$\backslash Sqsupset$	$\not\models$	$\backslash subsetneq$
$\not\models$	$\backslash nsqsubseteqq$	$\not\models$	$\backslash nsupset$	\supset	$\backslash sqsupset$	$\not\models$	$\backslash subsetneqq$
$\not\models$	$\backslash nSqsupset$	$\not\models$	$\backslash nsupseteq$	\supseteq	$\backslash sqsupseteq$	\supseteq	$\backslash Supset$
$\not\models$	$\backslash nsqsupset$	$\not\models$	$\backslash nsupseteqq$	\supseteqq	$\backslash sqsupseteqq$	\supseteqq	$\backslash supset$
$\not\models$	$\backslash nsqsupseteq$	\equiv	$\backslash Sqsubset$	$\not\models$	$\backslash sqsupsetneq$	\supseteq	$\backslash supseteq$
$\not\models$	$\backslash nsqsupseteqq$	\subset	$\backslash sqsubset$	$\not\models$	$\backslash sqsupsetneqq$	\supseteqq	$\backslash supseteqq$
$\not\models$	$\backslash nSubset$	\subseteq	$\backslash sqsubseteq$	\equiv	$\backslash Subset$	\supseteq	$\backslash supsetneq$
$\not\models$	$\backslash nsubset$	\equiv	$\backslash sqsubseteqq$	\subset	$\backslash subset$	\supseteq	$\backslash supsetneqq$

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

TABLE 119: fdsymbol Subset and Superset Relations

$\not\models$	$\backslash nsqsubset$	$\not\models$	$\backslash nsubseteq$	$\not\models$	$\backslash sqsubsetneq$	\subseteq	$\backslash subseteq$
$\not\models$	$\backslash nSqsubset$	$\not\models$	$\backslash nsubseteqq$	$\not\models$	$\backslash sqsubsetneqq$	\subseteq	$\backslash subseteqq$
$\not\models$	$\backslash nsqsubseteq$	$\not\models$	$\backslash nsupset$	\supset	$\backslash Sqsupset$	$\not\models$	$\backslash subsetneq$
$\not\models$	$\backslash nsqsubseteqq$	$\not\models$	$\backslash nSupset$	\supseteq	$\backslash Sqsupset$	$\not\models$	$\backslash subsetneqq$
$\not\models$	$\backslash nsqsupset$	$\not\models$	$\backslash nsupseteq$	\supseteqq	$\backslash sqsupseteq$	\supseteqq	$\backslash supset$
$\not\models$	$\backslash nSqsupset$	$\not\models$	$\backslash nsupseteqq$	\supseteqqq	$\backslash sqsupseteqq$	\supseteqqq	$\backslash Supset$
$\not\models$	$\backslash nsqsupseteq$	\subset	$\backslash sqsubset$	$\not\models$	$\backslash sqsupsetneq$	\supseteq	$\backslash supseteq$
$\not\models$	$\backslash nsqsupseteqq$	\equiv	$\backslash Sqsubset$	$\not\models$	$\backslash sqsupsetneqq$	\supseteqq	$\backslash supseteqq$
$\not\models$	$\backslash nsubset$	\subseteq	$\backslash sqsubseteq$	\subset	$\backslash subset$	\supseteq	$\backslash supsetneq$
$\not\models$	$\backslash nSubset$	\equiv	$\backslash sqsubseteqq$	\equiv	$\backslash Subset$	\supseteq	$\backslash supsetneqq$

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

TABLE 120: boisik Subset and Superset Relations

$\not\models$	$\backslash nsubset$	\equiv	$\backslash sqSubset$	\in	$\backslash subsetplus$	\supseteq	$\backslash supsetpluseq$
$\not\models$	$\backslash nsubseteq$	\equiv	$\backslash sqSupset$	\in	$\backslash subsetplusq$	$\not\models$	$\backslash varsubsetneq$
$\not\models$	$\backslash nsubseteqq$	\supset	$\backslash sqsupset$	\supseteq	$\backslash Supset$	$\not\models$	$\backslash varsubsetneqq$
$\not\models$	$\backslash nsupset$	\in	$\backslash Subset$	\supseteqq	$\backslash supseteqq$	\supseteqq	$\backslash varsupsetneq$
$\not\models$	$\backslash nsupseteq$	\subseteq	$\backslash subseteqq$	\supseteq	$\backslash supsetneq$	\supseteq	$\backslash varsupsetneqq$
$\not\models$	$\backslash nsupseteqq$	\subset	$\backslash subsetneq$	\supseteq	$\backslash supsetneqq$	\supseteq	$\backslash varsupsetneqq$
\subset	$\backslash sqsubset$	\subset	$\backslash subsetneqq$	\supseteq	$\backslash supsetplus$		

TABLE 121: stix Subset and Superset Relations

\subset	<code>\bsolhsub</code>	\sqsupseteq	<code>\sqsupseteqq</code>	\supset	<code>\suphsup</code>
\sqsubset	<code>\csub</code>	\sqsupsetneq	<code>\sqsupsetneqq</code>	\supsetarr	<code>\suplarr</code>
\sqsubseteq	<code>\csube</code>	\subdot	<code>\subedot</code>	\supmult	<code>\supmult</code>
\sqsupset	<code>\csup</code>	\submult	<code>\submult</code>	\Supset	<code>\Supset</code>
\sqsupsete	<code>\csupe</code>	\subrarr	<code>\subrarr</code>	\supset	<code>\supset</code>
$\leftarrow\subset$	<code>\leftarrow\subset</code>	\Subset	<code>\Subset</code>	\supsetapprox	<code>\supsetapprox</code>
\nsubseteq	<code>\nsqsubset</code>	\subset	<code>\subset</code>	\supsetcirc^*	<code>\supsetcirc*</code>
\nsubseteq	<code>\nsqsubseteq</code>	\subsetapprox	<code>\subsetapprox</code>	\supsetdot	<code>\supsetdot</code>
\nsubseteq	<code>\nsqsupset</code>	\subseteq	<code>\subseteq</code>	\supseteq	<code>\supseteq</code>
\nsubseteq	<code>\nsqsupseteq</code>	\subsetapprox	<code>\subsetapprox</code>	\supseteqq	<code>\supseteqq</code>
\nsubseteq	<code>\nsqsubset</code>	\subset	<code>\subset</code>	\supseteqq	<code>\supseteqq</code>
\nsubseteq	<code>\nsqsubseteq</code>	\subsetapprox	<code>\subsetapprox</code>	\supsetneq	<code>\supsetneq</code>
\nsubseteq	<code>\nsqsupset</code>	\subseteq	<code>\subseteq</code>	\supsetneqq	<code>\supsetneqq</code>
\nsubseteq	<code>\nsqsupseteq</code>	\subsetapprox	<code>\subsetapprox</code>	\supsetplus	<code>\supsetplus</code>
\nsubseteq	<code>\nsupset</code>	\subsetneq	<code>\subsetneq</code>	\supsim	<code>\supsim</code>
\nsubseteq	<code>\nsupseteq</code>	\subsetneqq	<code>\subsetneqq</code>	\supsub	<code>\supsub</code>
\nsubseteq	<code>\nsupseteqq</code>	\subsetneq	<code>\subsetneq</code>	\supsup	<code>\supsup</code>
$\rightarrow\supset$	<code>\rightarrowsupset</code>	\subsetneqq	<code>\subsetneqq</code>	\varsupsetneq	<code>\varsupsetneq</code>
\sqsupset	<code>\sqsubset</code>	\supsup	<code>\supsup</code>	\varsupsetneqq	<code>\varsupsetneqq</code>
\sqsupseteq	<code>\sqsubseteq</code>	\supdsub	<code>\supdsub</code>	\varsupsetneq	<code>\varsupsetneq</code>
\sqsupsetneq	<code>\sqsubsetneq</code>	\supedot	<code>\supedot</code>	\varsupsetneqq	<code>\varsupsetneqq</code>
\sqsupset	<code>\sqsupset</code>	\suphsol	<code>\suphsol</code>		

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

TABLE 122: Inequalities

$\geq \ \ \backslash geq \ \ \gg \ \ \backslash gg \ \ \leq \ \ \backslash leq \ \ \ll \ \ \backslash ll \ \ \neq \ \ \backslash neq$

 TABLE 123: *AMS* Inequalities

\asymp	<code>\eqslantgtr</code>	\triangleright	<code>\gtrdot</code>	$\vee\vee\vee\vee$	<code>\lesseqgtr</code>	$\not\asymp$	<code>\ngeq</code>
\ll	<code>\eqslantless</code>	$\swarrow\swarrow\swarrow\swarrow$	<code>\gtreqless</code>	$\vee\vee\vee\vee$	<code>\lesseqgqtr</code>	$\not\asymp$	<code>\ngeqq</code>
\lll	<code>\geqq</code>	$\swarrow\swarrow\swarrow\swarrow$	<code>\gtreqqless</code>	$\swarrow\swarrow\swarrow\swarrow$	<code>\lessgtr</code>	$\not\asymp$	<code>\ngeqlant</code>
\gg	<code>\eqslantlant</code>	$\swarrow\swarrow\swarrow\swarrow$	<code>\gtreqless</code>	$\swarrow\swarrow\swarrow\swarrow$	<code>\lessim</code>	$\not\asymp$	<code>\ngtr</code>
\ggg	<code>\ggg</code>	$\swarrow\swarrow\swarrow\swarrow$	<code>\gtrless</code>	$\swarrow\swarrow\swarrow\swarrow$	<code>\lll</code>	$\not\asymp$	<code>\nleq</code>
\approx	<code>\gnapprox</code>	$\approx\approx\approx\approx$	<code>\gtrsim</code>	$\ll\ll\ll\ll$	<code>\lnapprox</code>	$\not\approx$	<code>\nleqq</code>
\approx	<code>\gneq</code>	$\approx\approx\approx\approx$	<code>\gvertneqq</code>	$\approx\approx\approx\approx$	<code>\lnapprox</code>	$\not\approx$	<code>\nleqslant</code>
\approx	<code>\gneqq</code>	$\approx\approx\approx\approx$	<code>\leqq</code>	$\approx\approx\approx\approx$	<code>\lneq</code>	$\not\approx$	<code>\nleqslant</code>
\approx	<code>\gnsim</code>	$\approx\approx\approx\approx$	<code>\lessapprox</code>	$\approx\approx\approx\approx$	<code>\lnsim</code>	$\not\approx$	<code>\nless</code>
\approx	<code>\gtrapprox</code>	$\approx\approx\approx\approx$	<code>\lessdot</code>	$\approx\approx\approx\approx$	<code>\lvertneqq</code>	$\not\approx$	

TABLE 124: *wasy sym* Inequalities
 $\gtrsim \backslash apprge \quad \lesssim \backslash apprle$
TABLE 125: *txfonts/pffonts* Inequalities

\ggtrsim	$\backslash ngg$	\gtrless	$\backslash ngtrsim$	\lessgtr	$\backslash nlesssim$
\gtrlessapprox	$\backslash ngtrapprox$	\lessapprox	$\backslash nlessapprox$	\lessdot	$\backslash nll$
\lessgtrless	$\backslash ngtrless$	\lessapprox	$\backslash nlessgtr$		

TABLE 126: *mathabx* Inequalities

\gtrlessapprox	$\backslash eqslantgtr$	\gtrlessapprox	$\backslash gtreqless$	\lessapprox	$\backslash lesssim$	\gtrless	$\backslash ngtr$
\lessapprox	$\backslash eqslantless$	\gtrlessapprox	$\backslash gtreqqless$	\ll	$\backslash ll$	\gtrlessapprox	$\backslash ngtrapprox$
\gtrlessapprox	$\backslash geq$	\gtrlessapprox	$\backslash gtrless$	\ll	$\backslash lll$	\gtrlessapprox	$\backslash ngtrsim$
\gtrlessapprox	$\backslash geqq$	\gtrlessapprox	$\backslash gtrsim$	\lessapprox	$\backslash lnapprox$	\gtrlessapprox	$\backslash nleq$
\gtrlessapprox	$\backslash gg$	\gtrlessapprox	$\backslash gvertneqq$	\leq	$\backslash lneq$	\gtrlessapprox	$\backslash nleqq$
\gtrlessapprox	$\backslash ggg$	\gtrlessapprox	$\backslash leq$	\leq	$\backslash lneqq$	\gtrlessapprox	$\backslash nless$
\gtrlessapprox	$\backslash gnapprox$	\gtrlessapprox	$\backslash leqq$	\lessapprox	$\backslash lnsim$	\gtrlessapprox	$\backslash nlessapprox$
\gtrlessapprox	\backslashgneq	\gtrlessapprox	$\backslash lessapprox$	\leq	$\backslash lvertneqq$	\gtrlessapprox	$\backslash nlesssim$
\gtrlessapprox	\backslashgneqq	\gtrlessapprox	$\backslash lessdot$	$\not\equiv$	$\backslash neqslantgtr$	\gtrlessapprox	$\backslash nvargeq$
\gtrlessapprox	$\backslash gnsim$	\gtrlessapprox	$\backslash lesseqgtr$	$\not\equiv$	$\backslash neqslantless$	\gtrlessapprox	$\backslash nvarleq$
\gtrlessapprox	$\backslash gtrapprox$	\gtrlessapprox	$\backslash lesseqgtr$	$\not\equiv$	$\backslash ngeq$	\gtrlessapprox	$\backslash vargeq$
\gtrlessapprox	$\backslash gtrdot$	\gtrlessapprox	$\backslash lessgtr$	$\not\equiv$	$\backslash ngeqq$	\gtrlessapprox	$\backslash varleq$

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

TABLE 127: MnSymbol Inequalities

\geq	<code>\eqslantgtr</code>	$\geq\backslash\wedge$	<code>\gtreqless</code>	\leq	<code>\lesssim</code>	$\geq\backslash\wedge$	<code>\gtreqless</code>
\leq	<code>\eqslantless</code>	$\leq\backslash\wedge$	<code>\gtrless</code>	\ll	<code>\ll</code>	$\leq\backslash\wedge$	<code>\gtreqless</code>
\geq	<code>\geq</code>	$\geq\backslash\wedge$	<code>\gtrneqqless</code>	\lll	<code>\lll</code>	$\geq\backslash\wedge$	<code>\gtreqless</code>
\triangleright	<code>\geqclosed</code>	$\triangleright\backslash\wedge$	<code>\gtrsim</code>	\approx	<code>\lnapprox</code>	$\triangleright\backslash\wedge$	<code>\gtrless</code>
\geq	<code>\geqdot</code>	$\geq\backslash\wedge$	<code>\leq</code>	\leq	<code>\lneqq</code>	$\geq\backslash\wedge$	<code>\nleq</code>
\geq	<code>\geqq</code>	$\geq\backslash\wedge$	<code>\leqclosed</code>	$\not\approx$	<code>\lnsim</code>	$\geq\backslash\wedge$	<code>\nleqclosed</code>
\geq	<code>\geqlant</code>	$\geq\backslash\wedge$	<code>\leqdot</code>	$\not\approx$	<code>\neqslantgtr</code>	$\geq\backslash\wedge$	<code>\nleqdot</code>
\geq	<code>\geqlantdot</code>	$\geq\backslash\wedge$	<code>\leqq</code>	$\not\approx$	<code>\neqslantless</code>	$\geq\backslash\wedge$	<code>\nleqq</code>
\gg		$\gg\backslash\wedge$	<code>\leqslant</code>	$\not\approx$	<code>\ngeq</code>	$\gg\backslash\wedge$	<code>\nleqslant</code>
\ggg		$\ggg\backslash\wedge$	<code>\leqslantdot</code>	$\not\approx$	<code>\ngeqclosed</code>	$\ggg\backslash\wedge$	<code>\nleqslantdot</code>
\approx	<code>\gnapprox</code>	$\approx\backslash\wedge$	<code>\less</code>	$\not\approx$	<code>\ngeqdot</code>	$\approx\backslash\wedge$	<code>\nless</code>
$\not\approx$	<code>\gneqq</code>	$\not\approx\backslash\wedge$	<code>\lessapprox</code>	$\not\approx$	<code>\ngeqq</code>	$\not\approx\backslash\wedge$	<code>\nlessclosed</code>
$\not\approx$	<code>\gnsim</code>	$\not\approx\backslash\wedge$	<code>\lessclosed</code>	$\not\approx$	<code>\ngeqslant</code>	$\not\approx\backslash\wedge$	<code>\nlessdot</code>
$>$	<code>\gtr</code>	$>\backslash\wedge$	<code>\lessdot</code>	$\not\approx$	<code>\ngeqslantdot</code>	$>\backslash\wedge$	<code>\nlesseqgtr</code>
\approx	<code>\gtrapprox</code>	$\approx\backslash\wedge$	<code>\lesseqgtr</code>	$\not\approx$	<code>\ngg</code>	$\approx\backslash\wedge$	<code>\nlesseqgtrslant</code>
\triangleright	<code>\gtrclosed</code>	$\triangleright\backslash\wedge$	<code>\lesseqgtrslant</code>	\gg	<code>\nggg</code>	$\triangleright\backslash\wedge$	<code>\nlesseqgqgtr</code>
$>$	<code>\gtrdot</code>	$>\backslash\wedge$	<code>\lesseqgqgtr</code>	$\not\approx$	<code>\ngtr</code>	$\not\approx\backslash\wedge$	<code>\nlessgtr</code>
$\approx\backslash\wedge$	<code>\gtreqless</code>	$\approx\backslash\wedge$	<code>\lessgr</code>	$\not\approx$	<code>\ngtrclosed</code>	$\approx\backslash\wedge$	<code>\nll</code>
$\approx\backslash\wedge$	<code>\gtreqless</code>	$\approx\backslash\wedge$	<code>\lessneqqgtr</code>	$\not\approx$	<code>\ngtrdot</code>	$\approx\backslash\wedge$	<code>\nlll</code>

MnSymbol additionally defines synonyms for some of the preceding symbols:

\ggg	<code>\gggtr</code>	(same as <code>\ggg</code>)
$\not\approx$	<code>\gvertneqq</code>	(same as <code>\gneqq</code>)
\triangleleft	<code>\lhd</code>	(same as <code>\lessclosed</code>)
\lll	<code>\lll</code>	(same as <code>\lll</code>)
$\not\approx$	<code>\lvertneqq</code>	(same as <code>\lneqq</code>)
$\not\approx$	<code>\ntrianglelefteq</code>	(same as <code>\nleqclosed</code>)
$\not\approx$	<code>\ntriangleleft</code>	(same as <code>\nlessclosed</code>)
$\not\approx$	<code>\ntrianglerighteq</code>	(same as <code>\ngeqclosed</code>)
$\not\approx$	<code>\ntriangleright</code>	(same as <code>\ngtrclosed</code>)
\triangleright	<code>\rhd</code>	(same as <code>\gtrclosed</code>)
\triangleleft	<code>\trianglelefteq</code>	(same as <code>\leqclosed</code>)
\triangleright	<code>\trianglerighteq</code>	(same as <code>\geqclosed</code>)
\triangleleft	<code>\unlhd</code>	(same as <code>\leqclosed</code>)
\triangleright	<code>\unrhd</code>	(same as <code>\geqclosed</code>)
\triangleleft	<code>\vartriangleleft</code>	(same as <code>\lessclosed</code>)
\triangleright	<code>\vartriangleright</code>	(same as <code>\gtrclosed</code>)

TABLE 128: *fdsymbol* Inequalities

\geq	<code>\eqslantgtr</code>	\leq	<code>\eqslantdot</code>	$\not\equiv$	<code>\ngtrapprox</code>
\leq	<code>\eqslantless</code>	\geq	<code>\eqslcc</code>	$\not\leq$	<code>\ngtrcc</code>
\geq	<code>\geq</code>	$<$	<code>\less</code>	$\not\geq$	<code>\ngtrclosed</code>
\trianglelefteq	<code>\geqclosed</code>	\leqq	<code>\lessapprox</code>	$\not\trianglelefteq$	<code>\ngtrdot</code>
\geq	<code>\geqdot</code>	\triangleleft	<code>\lesscc</code>	$\not\geq$	<code>\ngtreqless</code>
\geqq	<code>\geqq</code>	\triangleleft	<code>\lessclosed</code>	$\not\geqq$	<code>\ngtreqqless</code>
\geq	<code>\geqlant</code>	\triangleleft	<code>\lessdot</code>	$\not\geq$	<code>\ngtreqslantless</code>
\geq	<code>\geqlantdot</code>	$\leq \geq$	<code>\lesseqgtr</code>	$\not\geq$	<code>\ngtrless</code>
\geq	<code>\geqlcc</code>	$\leq \geq$	<code>\lesseqgtr</code>	$\not\geq$	<code>\ngtrsim</code>
\gg	<code>\gg</code>	$\geq \leq$	<code>\lesseqslantgtr</code>	$\not\geq$	<code>\nleq</code>
\ggg	<code>\ggg</code>	$\geq \leq$	<code>\lessgtr</code>	$\not\geq$	<code>\nleqclosed</code>
$\not\geq$	<code>\gnapprox</code>	$\leq \leq$	<code>\lessim</code>	$\not\geq$	<code>\nleqdot</code>
$\not\geq$	<code>\gneq</code>	\ll	<code>\l1</code>	$\not\geq$	<code>\nleqq</code>
$\not\geq$	<code>\gneqq</code>	\lll	<code>\l11</code>	$\not\geq$	<code>\nleqlant</code>
$\not\geq$	<code>\gnsim</code>	$\not\leq \not\geq$	<code>\lnapprox</code>	$\not\geq$	<code>\nleqlantdot</code>
$>$	<code>\gtr</code>	$\not\leq$	<code>\lneq</code>	$\not\geq$	<code>\nleqlcc</code>
$\not\geq$	<code>\gtrapprox</code>	$\not\leq$	<code>\lneqq</code>	$\not\geq$	<code>\nless</code>
\triangleright	<code>\gtrcc</code>	$\not\leq$	<code>\lnsim</code>	$\not\geq$	<code>\nlessapprox</code>
\triangleright	<code>\gtrclosed</code>	$\not\leq$	<code>\neqlantgtr</code>	$\not\geq$	<code>\nlesscc</code>
$>$	<code>\gtrdot</code>	$\not\leq$	<code>\neqlantless</code>	$\not\geq$	<code>\nlessclosed</code>
$\not\geq \not\leq$	<code>\gtreqless</code>	$\not\leq$	<code>\ngeq</code>	$\not\geq$	<code>\nlessdot</code>
$\not\geq \not\leq$	<code>\gtreqqless</code>	$\not\leq$	<code>\ngeqclosed</code>	$\not\geq$	<code>\nlesseqgtr</code>
$\not\geq \not\leq$	<code>\gtreqslantless</code>	$\not\leq$	<code>\ngeqdot</code>	$\not\geq$	<code>\nlesseqgqtr</code>
$\not\geq$	<code>\gtrless</code>	$\not\leq$	<code>\ngeqq</code>	$\not\geq$	<code>\nlesseqslantgtr</code>
\geq	<code>\gtrsim</code>	$\not\leq$	<code>\ngeqlant</code>	$\not\geq$	<code>\nlessgtr</code>
\leq	<code>\leq</code>	$\not\leq \not\geq$	<code>\ngeqlantdot</code>	$\not\geq$	<code>\nlessim</code>
\trianglelefteq	<code>\leqclosed</code>	$\not\leq$	<code>\ngeqlcc</code>	$\not\geq$	<code>\nll</code>
\trianglelefteq	<code>\leqdot</code>	$\not\geq$	<code>\ngg</code>	$\not\geq$	<code>\nlll</code>
$\not\leq$	<code>\leqq</code>	\gg	<code>\nggg</code>		
$\not\leq$	<code>\leqlant</code>	$\not\geq$	<code>\ngtr</code>		

fdsymbol defines synonyms for some of the preceding symbols:

\geq	<code>\ge</code>	\leq	<code>\lesdot</code>	$\not\leq$	<code>\ngtcc</code>
\trianglelefteq	<code>\gescc</code>	\leq	<code>\lesg</code>	$\not\leq$	<code>\ngtreqlesslant</code>
\geq	<code>\gesdot</code>	\leq	<code>\lesseqgtrslant</code>	$\not\leq$	<code>\nlescc</code>
\geq	<code>\gesl</code>	\triangleleft	<code>\lhd</code>	$\not\geq$	<code>\nlesdot</code>
\ggg	<code>\gggtr</code>	\lll	<code>\l1less</code>	$\not\geq$	<code>\nlesg</code>

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\triangleright	\gtcc	\triangleleft	\ltcc	\nleqslant	$\nlesseqgtr_{\text{slant}}$
\lessdot	$\gtreqless_{\text{slant}}$	$\not\leq$	$\lvert neqq$	$\not\geq$	\nltcc
$\not\geq$	\gvertneqq	$\not\leq$	\ngescc	\triangleright	\rhd
\leq	\le	$\not\leq$	\ngesdot	\trianglelefteq	\unlhd
\triangleleft	\lescc	$\not\geq$	\ngesl	\trianglerighteq	\unrhd

TABLE 129: boisik Inequalities

\asymp	\eqslantgtr	\asymp	\gtcir	\asymp	\lesseqgtr	$\not\geq$	\ngeq
\ll	\eqslantless	$\approx\approx$	\gtreqapprox	\ll	\lessgtr	$\not\geq$	\ngeqq
$\approx\approx$	\geqq	$\approx\approx\approx\approx$	\gtreqless	\approx	\lessim	$\not\geq$	\ngeqslant
$\approx\approx$	\geqslant	$\approx\approx\approx\approx$	\gtreqless	$\ll\ll$	\lll	$\not\geq$	\ngtr
$\gg\gg$	\gg	$\approx\approx$	\gtreqless	$\approx\approx$	\lnapprox	$\not\geq$	\nleq
$\times\approx$	\glj	$\approx\approx$	\gtreqless	$\approx\approx$	\lneq	$\not\geq$	\nleqq
$\approx\approx$	\gnapprox	$\approx\approx$	\gvertneqq	$\approx\approx$	\lneqq	$\not\geq$	\nleqslant
$\approx\approx$	\gneq	$\leq\leq$	\leqq	$\approx\approx$	\lnsim	$\not\geq$	\nless
$\approx\approx$	\gneqq	$\leq\leq$	\leqslant	\ll	\lt		
$\approx\approx$	\gnsim	$\approx\approx$	\lessapprox	$\approx\approx$	\ltcir		
$\approx\approx$	\Gt	$\approx\approx$	\lesseqgtr	$\approx\approx$	$\lvert neqq$		

TABLE 130: stix Inequalities

\asymp	\egsdot	\asymp	\gtquest	\asymp	\lnsim
\ll	\elsdot	$\approx\approx$	\gtreqapprox	$\approx\approx$	\lsime
$\approx\approx$	\eqgtr	$\approx\approx$	\gtreqarr	$\approx\approx$	\lsimg
$\approx\approx$	\eqless	$\approx\approx$	\gtreqdot	\ll	\lt
$\approx\approx\approx\approx$	\eqqgtr	$\approx\approx\approx\approx$	\gtreqless	\triangleleft	\ltcc
$\approx\approx\approx\approx$	\eqqless	$\approx\approx\approx\approx$	\gtreqless	\triangleleft	\ltcir
$\approx\approx\approx\approx$	\eqslantgtr	$\approx\approx\approx\approx$	\gtreqless	$\approx\approx$	\ltlarr
$\approx\approx\approx\approx$	\eqslantless	$\approx\approx\approx\approx$	\gtreqless	$\approx\approx$	\ltquest
$\approx\approx$	\eqslantgtr	$\approx\approx$	\gvertneqq	$\approx\approx$	$\lvert neqq$
$\approx\approx$	\eqslantless	$\approx\approx$	\lat	$\not\geq$	\neqslantgtr
$\approx\approx$	\geq	$\approx\approx$	\late	$\not\geq$	\neqslantless
$\approx\approx$	\geqq	$\approx\approx$	\leftarrowless	$\not\geq$	\ngeq

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\geqslant	<code>\geqqslant</code>	\leq	<code>\leq</code>	\ngeq	<code>\ngeqq</code>
\geqslant	<code>\geqlant</code>	\leq	<code>\leqq</code>	\ngeqslant	<code>\ngeqslant</code>
\gtrless	<code>\gescc</code>	\lessgtr	<code>\leqqslant</code>	\ngtr	<code>\ngg</code>
\gtrless	<code>\gesdot</code>	\lessgtr	<code>\leqslant</code>	\ngtrless	<code>\ngtrless</code>
\gtrless	<code>\gesdoto</code>	\lessdot	<code>\lescc</code>	\ngtrlessim	<code>\ngtrlessim</code>
\gtrless	<code>\gesdotol</code>	\lessdot	<code>\lesdot</code>	\nleq	<code>\nleq</code>
\gtrless	<code>\gesles</code>	\lessdot	<code>\lesdoto</code>	\nleqq	<code>\nleqq</code>
\gg	<code>\gg</code>	\lessdot	<code>\lesdotor</code>	\nleqslant	<code>\nleqslant</code>
\ggg	<code>\ggg</code>	\lessapprox	<code>\lesges</code>	\nless	<code>\nless</code>
\gggnest	<code>\gggnest</code>	\lessapprox	<code>\lessapprox</code>	\nlessgtr	<code>\nlessgtr</code>
\gla	<code>\gla</code>	\lessdot	<code>\lessdot</code>	\nlesssim	<code>\nlesssim</code>
\gle	<code>\gle</code>	\lessdot	<code>\lesseqtr</code>	\nll	<code>\nll</code>
\glj	<code>\glj</code>	\lessdot	<code>\lesseqgtr</code>	∂	<code>\partial</code>
\gnapprox	<code>\gnapprox</code>	\lessdot	<code>\lessgtr</code>	$\partial\partial$	<code>\partial\partial</code>
\gneq	<code>\gneq</code>	\lessdot	<code>\lessim</code>	\rightarrowtail	<code>\rightarrowtail</code>
\gneqq	<code>\gneqq</code>	\lessdot	<code>\lgE</code>	\approx	<code>\simE</code>
\gnsim	<code>\gnsim</code>	\lessdot	<code>\ll</code>	\approx	<code>\simgr</code>
\gsime	<code>\gsime</code>	\lessdot	<code>\lll</code>	\approx	<code>\simLE</code>
\gsiml	<code>\gsiml</code>	\lessdot	<code>\lllnest</code>	\approx	<code>\simless</code>
\gt	<code>\Gt</code>	\lessdot	<code>\lnapprox</code>	\triangleleft	<code>\smt</code>
\gtcc	<code>\gtcc</code>	\lessdot	<code>\lneq</code>	\trianglelefteq	<code>\smte</code>
\gtcir	<code>\gtcir</code>	\lessdot	<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 131: *AMS* Triangle Relations

\blacktriangleleft	<code>\blacktriangleleft</code>	\triangleright	<code>\triangleright</code>	\trianglerighteq	<code>\trianglerighteq</code>
\blacktriangleright	<code>\blacktriangleright</code>	\triangleright	<code>\triangleright</code>	\vartriangleleft	<code>\vartriangleleft</code>
\triangleleft	<code>\triangleleft</code>	\triangleleft	<code>\triangleleft</code>	\vartriangleleft	<code>\vartriangleleft</code>
\trianglelefteq	<code>\trianglelefteq</code>	\trianglelefteq	<code>\trianglelefteq</code>	\vartriangleleft	<code>\vartriangleleft</code>

TABLE 132: stmaryrd Triangle Relations

\trianglelefteqslant	<code>\trianglelefteqslant</code>	\trianglerighteqslant	<code>\trianglerighteqslant</code>
\trianglelefteqslant	<code>\trianglelefteqslant</code>	\trianglerighteqslant	<code>\trianglelefteqslant</code>

TABLE 133: `mathabx` Triangle Relations

\triangleleft	<code>\ntriangleleft</code>	\lhd	<code>\triangleleft</code>	\lhd	<code>\vartriangleleft</code>	\lhd	<code>\vartriangleleft</code>
\trianglelefteq	<code>\ntrianglelefteq</code>	$\lhd\!\!\lhd$	<code>\trianglelefteq</code>	$\lhd\!\!\lhd$	<code>\vartrianglelefteq</code>	$\lhd\!\!\lhd$	<code>\vartrianglelefteq</code>
\triangleright	<code>\ntriangleright</code>	\rhd	<code>\triangleright</code>	\rhd	<code>\vartriangleright</code>	\rhd	<code>\vartriangleright</code>
\trianglerighteq	<code>\ntrianglerighteq</code>	$\rhd\!\!\rhd$	<code>\trianglerighteq</code>	$\rhd\!\!\rhd$	<code>\vartrianglerighteq</code>	$\rhd\!\!\rhd$	<code>\vartrianglerighteq</code>

TABLE 134: `MnSymbol` Triangle Relations

\blacktriangledown	<code>\filledmedtriangledown</code>	\blacktriangleup	<code>\largetriangleup</code>	\blacktriangledown	<code>\smalltriangledown</code>	\blacktriangleup	<code>\smalltriangleup</code>
\blacktriangleleft	<code>\filledmedtriangleleft</code>	\blacktriangledown	<code>\medtriangledown</code>	\blacktriangleleft	<code>\smalltriangleleft</code>	\blacktriangleleft	<code>\smalltriangleleft</code>
\blacktriangleright	<code>\filledmedtriangleright</code>	\blacktriangleleft	<code>\medtriangleleft</code>	\blacktriangleright	<code>\smalltriangleright</code>	\blacktriangleright	<code>\smalltriangleright</code>
\blacktriangle	<code>\filledmedtriangleup</code>	\blacktriangleleft	<code>\medtriangleright</code>	\blacktriangle	<code>\smalltriangleup</code>	\blacktriangle	<code>\smalltriangleup</code>
\blacktriangledown	<code>\filledtriangledown</code>	\blacktriangleup	<code>\medtriangleup</code>	\blacktriangledown	<code>\triangleeq</code>	\blacktriangledown	<code>\triangleeq</code>
\blacktriangleleft	<code>\filledtriangleleft</code>	\neq	<code>\ntriangleeq</code>	\blacktriangleleft	<code>\trianglelefteq</code>	\blacktriangleleft	<code>\trianglelefteq</code>
\blacktriangleright	<code>\filledtriangleright</code>	\neq	<code>\ntriangleleft</code>	\blacktriangleright	<code>\trianglerighteq</code>	\blacktriangleright	<code>\trianglerighteq</code>
\blacktriangleup	<code>\filledtriangleup</code>	\neq	<code>\ntrianglelefteq</code>	\blacktriangleup	<code>\vartriangleleft</code>	\blacktriangleup	<code>\vartriangleleft</code>
\blacktriangledown	<code>\largetriangledown</code>	\neq	<code>\ntriangleright</code>	\blacktriangledown	<code>\vartriangleright</code>	\blacktriangledown	<code>\vartriangleright</code>
\blacktriangleleft	<code>\largetriangleleft</code>	\neq	<code>\ntrianglerighteq</code>	\blacktriangleleft	<code>\ntrianglerighteq</code>	\blacktriangleleft	<code>\ntrianglerighteq</code>
\blacktriangleright	<code>\largetriangleright</code>	\neq	<code>\ntriangleleft</code>	\blacktriangleright	<code>\ntriangleleft</code>	\blacktriangleright	<code>\ntriangleleft</code>
\blacktriangleup	<code>\largetriangleup</code>	\circledcirc	<code>\otriangle</code>	\blacktriangleup		\blacktriangleup	

`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 `\trianglelefteq`; `\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`; `\lessclosed` is a synonym for `\ntriangleleft`; `\ngtrclosed` is a synonym for `\ntriangleright`; `\leqclosed` is a synonym for `\ntrianglelefteq`; and `\geqclosed` is a synonym for `\ntrianglerighteq`.

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 135: *fdsymbol* Triangle Relations

\trianglelefteq	<code>\geqclosed</code>	\triangleright	<code>\medtriangledown</code>	\blacktriangleleft	<code>\smallblacktriangleleft</code>
\triangleright	<code>\gtrclosed</code>	\triangleleft	<code>\medtriangleleft</code>	\blacktriangleright	<code>\smallblacktriangleright</code>
\bigtriangledown	<code>\largetriangledown</code>	\triangleright	<code>\medtriangleright</code>	\blacktriangleup	<code>\smallblacktriangleup</code>
\bigtriangleup	<code>\largetriangleup</code>	\triangleleft	<code>\medtriangleup</code>	\blacktriangledown	<code>\smalltriangledown</code>
\trianglelefteqslant	<code>\leqclosed</code>	$\not\trianglelefteq$	<code>\ngeqclosed</code>	\triangleleft	<code>\smalltriangleleft</code>
\trianglelefteq	<code>\lessclosed</code>	$\not\trianglelefteq$	<code>\ngtrclosed</code>	\triangleright	<code>\smalltriangleright</code>
\bigtriangledown	<code>\medblacktriangledown</code>	$\not\trianglelefteq$	<code>\nleqclosed</code>	\triangleup	<code>\smalltriangleup</code>
\blacktriangleleft	<code>\medblacktriangleleft</code>	$\not\trianglelefteq$	<code>\nlessclosed</code>	\triangleq	<code>\triangleeq</code>
\blacktriangleright	<code>\medblacktriangleright</code>	$\not\trianglelefteq$	<code>\ntriangleeq</code>	\bigtriangledown	<code>\smallblacktriangledown</code>
\blacktriangleup	<code>\medblacktriangleup</code>	\triangleright	<code>\smallblacktriangledown</code>		

fdsymbol defines synonyms for almost all of the preceding symbols:

\bigtriangledown	<code>\bigtriangledown</code>	$\not\trianglelefteq$	<code>\ntrianglelefteq</code>	\triangleq	<code>\triangleeq</code>
\bigtriangleup	<code>\bigtriangleup</code>	$\not\trianglelefteq$	<code>\ntrianglelefteq</code>	\triangleright	<code>\triangleright</code>
\blacktriangle	<code>\blacktriangle</code>	$\not\trianglelefteq$	<code>\ntrianglelefteq</code>	\triangleq	<code>\triangleq</code>
\blacktriangledown	<code>\blacktriangledown</code>	\triangle	<code>\triangle</code>	\triangle	<code>\vartriangle</code>
\blacktriangleleft	<code>\blacktriangleleft</code>	\triangleright	<code>\triangleright</code>	\triangleleft	<code>\vartriangleleft</code>
\blacktriangleright	<code>\blacktriangleright</code>	\triangleleft	<code>\triangleleft</code>	\triangleright	<code>\vartriangleright</code>
$\not\triangleleft$	<code>\not\triangleleft</code>	\trianglelefteq	<code>\trianglelefteq</code>	\trianglelefteq	<code>\trianglelefteq</code>

The title “Triangle Relations” is a bit of a misnomer here as only `\triangleeq` and `\triangleq` 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 136: *boisik* Triangle Relations

\trianglelefteq	<code>\ntriangleleft</code>	\trianglelefteq	<code>\trianglelefteq</code>	\triangleleft	<code>\varlrttriangle</code>
\trianglelefteqslant	<code>\ntrianglelefteqslant</code>	\trianglelefteqslant	<code>\trianglelefteqslant</code>	\triangle	<code>\vartriangle</code>
\triangleleft	<code>\ntriangleleft</code>	\triangleleft	<code>\triangleleft</code>	\triangleleft	<code>\vartriangleleft</code>
\trianglelefteq	<code>\ntrianglelefteqeq</code>	\trianglelefteq	<code>\trianglelefteq</code>	\triangleleft	<code>\vartriangleright</code>
\trianglelefteq	<code>\ntrianglelefteq</code>	\trianglelefteq	<code>\trianglelefteq</code>	\triangleleft	<code>\vartriangleright</code>

TABLE 137: *stix* Triangle Relations

\trianglelefteq	<code>\lrtriangleeq</code>	\trianglelefteq	<code>\nvartriangleright</code>	\triangle	<code>\vartriangle</code>
\triangleleft	<code>\ltrivb</code>	\triangleleft	<code>\rtriltri</code>	\triangleleft	<code>\vartriangleleft</code>
\trianglelefteq	<code>\ntrianglelefteq</code>	\trianglelefteq	<code>\trianglelefteq</code>	\triangleleft	<code>\vartriangleright</code>
\trianglelefteq	<code>\ntrianglelefteqeq</code>	\trianglelefteq	<code>\trianglelefteq</code>	\triangleleft	<code>\vartriangleright</code>
\trianglelefteq	<code>\ntrianglelefteq</code>	\trianglelefteq	<code>\trianglelefteq</code>	\triangleleft	<code>\vartriangleright</code>

TABLE 138: 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> *	\longmapsto	<code>\longmapsto</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>
\leftrightarrow	<code>\leftrightarrow</code>	\nearrow^\dagger	<code>\nearrow^\dagger</code>	\Updownarrow	<code>\Updownarrow</code>

* Not predefined by the L^AT_EX 2_< core. Use the `latexsym` package to expose this symbol.

† See the note beneath Table 240 for information about how to put a diagonal arrow across a mathematical expression (as in “ $\nabla \cdot \vec{B}$ ”).

TABLE 139: Harpoons

\leftarrow	<code>\leftharpoondown</code>	\rightarrow	<code>\rightharpoondown</code>	\rightleftharpoons	<code>\rightleftharpoons</code>
\leftarrow	<code>\leftharpoonup</code>	\rightarrow	<code>\rightharpoonup</code>		

TABLE 140: `textcomp` Text-mode Arrows

\downarrow	<code>\textdownarrow</code>	\rightarrow	<code>\textrightarrow</code>
\leftarrow	<code>\textleftarrow</code>	\uparrow	<code>\textuparrow</code>

TABLE 141: *AMS* Arrows

\circlearrowleft	<code>\circlearrowleft</code>	\Leftarrow	<code>\Leftarrow</code>	\rightleftarrows	<code>\rightleftarrows</code>
\circlearrowright	<code>\circlearrowright</code>	\Rightarrow	<code>\Rightarrow</code>	\rightleftarrows	<code>\rightleftarrows</code>
\curvearrowleft	<code>\curvearrowleft</code>	\rightsquigarrow	<code>\rightsquigarrow</code>	\rightsquigarrow	<code>\rightsquigarrow</code>
\curvearrowright	<code>\curvearrowright</code>	\Leftarrow	<code>\Leftarrow</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		\upuparrows	<code>\upuparrows</code>
\leftarrowtail	<code>\leftarrowtail</code>	\rightarrowtail	<code>\rightarrowtail</code>		

TABLE 142: *AMS* Negated Arrows

$\not\Leftarrow$	<code>\not\Leftarrow</code>	$\not\Rightarrow$	<code>\not\Rightarrow</code>	$\not\rightleftarrows$	<code>\not\rightleftarrows</code>
$\not\leftarrowtail$	<code>\not\leftarrowtail</code>	$\not\rightarrowtail$	<code>\not\rightarrowtail</code>	$\not\upuparrows$	<code>\not\upuparrows</code>

TABLE 143: *AMS* Harpoons

$\downarrow \downarrow \downarrow$	$\backslash\text{downharpoonleft}$	$\Leftarrow \Leftarrow \Leftarrow$	$\backslash\text{leftrightharpoons}$	$\uparrow \uparrow \uparrow$	$\backslash\text{upharpoonleft}$
$\downarrow \downarrow \downarrow$	$\backslash\text{downharpoonright}$	$\Rightarrow \Rightarrow \Rightarrow$	$\backslash\text{rightleftharpoons}$	$\uparrow \uparrow \uparrow$	$\backslash\text{upharpoonright}$

TABLE 144: stmaryrd Arrows

\leftarrow	$\backslash\text{leftarrowtriangle}$	\Leftarrow	$\backslash\text{Mapsfrom}$	\leftarrow	$\backslash\text{shortleftarrow}$
\Leftarrow	$\backslash\text{leftrightarroweq}$	\Leftarrow	$\backslash\text{mapsfrom}$	\rightarrow	$\backslash\text{shortrightarrow}$
\Leftrightarrow	$\backslash\text{leftrightarrowtriangle}$	\Rightarrow	$\backslash\text{Mapsto}$	\uparrow	$\backslash\text{shortuparrow}$
\swarrow	$\backslash\text{lightning}$	\nearrow	$\backslash\text{nnearrow}$	\downarrow	$\backslash\text{ssearrow}$
\Longleftarrow	$\backslash\text{Longmapsfrom}$	\nearrow	$\backslash\text{nnarrow}$	\downarrow	$\backslash\text{ssarrow}$
\Longleftarrow	$\backslash\text{longmapsfrom}$	\rightarrow	$\backslash\text{rightarrowtriangle}$	\downarrow	$\backslash\text{shortdownarrow}$
\Longrightarrow	$\backslash\text{Longmapsto}$				

TABLE 145: txfonts/pfxfonts Arrows

$\square \square \square$	$\backslash\text{boxdotLeft}$	$\circ \circ \circ$	$\backslash\text{circleddotright}$	$\diamond \diamond \diamond$	$\backslash\text{Diamondleft}$
$\square \square \square$	$\backslash\text{boxdotleft}$	$\square \square \square$	$\backslash\text{circleleft}$	$\diamond \diamond \diamond$	$\backslash\text{Diamondright}$
$\square \square \square$	$\backslash\text{boxdotright}$	$\circ \circ \circ$	$\backslash\text{circleright}$	$\diamond \diamond \diamond$	$\backslash\text{DiamondRight}$
$\square \square \square$	$\backslash\text{boxdotRight}$	$\leftrightarrow \leftrightarrow \leftrightarrow$	$\backslash\text{dashleftrightharrow}$	$\rightsquigarrow \rightsquigarrow \rightsquigarrow$	$\backslash\text{leftsquigarrow}$
$\square \square \square$	$\backslash\text{boxLeft}$	$\square \square \square$	$\backslash\text{DiamonddotLeft}$	$\nearrow \nearrow \nearrow$	$\backslash\text{Narrow}$
$\square \square \square$	$\backslash\text{boxleft}$	$\square \square \square$	$\backslash\text{Diamonddotleft}$	$\nwarrow \nwarrow \nwarrow$	$\backslash\text{Nwarrow}$
$\square \square \square$	$\backslash\text{boxright}$	$\diamond \diamond \diamond$	$\backslash\text{Diamonddotright}$	$\Rightarrow \Rightarrow \Rightarrow$	$\backslash\text{Rightarrow}$
$\square \square \square$	$\backslash\text{boxRight}$	$\diamond \diamond \diamond$	$\backslash\text{DiamonddotRight}$	$\searrow \searrow \searrow$	$\backslash\text{Searrow}$
$\circ \circ \circ$	$\backslash\text{circleddotleft}$	$\square \square \square$	$\backslash\text{DiamondLeft}$	$\swarrow \swarrow \swarrow$	$\backslash\text{Swarrow}$

TABLE 146: mathabx Arrows

\circlearrowleft	$\backslash\text{circlearrowleft}$	\leftarrow	$\backslash\text{leftarrow}$	\nwarrow	$\backslash\text{narrow}$
\circlearrowright	$\backslash\text{circlearrowright}$	\Leftarrow	$\backslash\text{leftleftarrows}$	\restriction	$\backslash\text{restriction}$
\curvearrowbotleft	$\backslash\text{curvearrowbotleft}$	\leftrightarrow	$\backslash\text{leftrightharrow}$	\rightarrow	$\backslash\text{rightarrow}$
\curvearrowbotleft	$\backslash\text{curvearrowbotleftright}$	\Leftrightarrow	$\backslash\text{leftrightharrows}$	\Rightarrow	$\backslash\text{rightleftarrows}$
\curvearrowbotright	$\backslash\text{curvearrowbotright}$	$\rightsquigarrow \rightsquigarrow \rightsquigarrow$	$\backslash\text{leftrightsquigarrow}$	\Rightarrow	$\backslash\text{rightrightarrows}$
\curvearrowleft	$\backslash\text{curvearrowleft}$	$\rightsquigarrow \rightsquigarrow \rightsquigarrow$	$\backslash\text{leftsquigarrow}$	$\rightsquigarrow \rightsquigarrow \rightsquigarrow$	$\backslash\text{rightsquigarrow}$
\curvearrowleftright	$\backslash\text{curvearrowleftright}$	\circlearrowright	$\backslash\text{lefttorightharrow}$	\circlearrowleft	$\backslash\text{righttoleftarrow}$
\curvearrowright	$\backslash\text{curvearrowright}$	\Leftrightarrow	$\backslash\text{looparrowdownleft}$	\Rsh	$\backslash\text{Rsh}$
\dsh	$\backslash\text{dsh}$	\Leftrightarrow	$\backslash\text{looparrowdownright}$	\searrow	$\backslash\text{searrow}$
\downdownarrows	$\backslash\text{downdownarrows}$	\Leftrightarrow	$\backslash\text{looparrowleft}$	\swarrow	$\backslash\text{swarrow}$
\downtouparrow	$\backslash\text{downtouparrow}$	\Leftrightarrow	$\backslash\text{looparrowright}$	\updownarrow	$\backslash\text{updownarrows}$
\downuparrows	$\backslash\text{downuparrows}$	\Leftrightarrow	$\backslash\text{Lsh}$	Ω	$\backslash\text{uptodownarrow}$
\drsh	$\backslash\text{drsh}$	\nearrow	$\backslash\text{nearrow}$	$\uparrow\uparrow$	$\backslash\text{upuparrows}$

TABLE 147: mathabx Negated Arrows

$\not\equiv$	$\backslash\text{nLeftarrow}$	\Leftrightarrow	$\backslash\text{nleftrightharrow}$	\Rightarrow	$\backslash\text{nrightarrow}$
$\not\equiv$	$\backslash\text{nleftarrow}$	\Leftrightarrow	$\backslash\text{nLeftrightharrow}$	\Rightarrow	$\backslash\text{nRightarrow}$

TABLE 148: mathabx Harpoons

\Leftarrow	<code>\barleftharpoon</code>	\leftarrow	<code>\leftharpoonup</code>	\Rightarrow	<code>\rightleftharpoons</code>
$=$	<code>\barrightharpoon</code>	\Leftarrow	<code>\leftleftharpoons</code>	\Rightarrow	<code>\rightrightharpoons</code>
\Downarrow	<code>\downdownharpoons</code>	\leftarrow	<code>\leftrightharpoon</code>	\Downarrow	<code>\updownharpoons</code>
\downarrow	<code>\downharpoonleft</code>	\Leftarrow	<code>\leftrightharpoons</code>	\uparrow	<code>\upharpoonleft</code>
\downarrow	<code>\downharpoonright</code>	\Rightarrow	<code>\rightbarharpoon</code>	\uparrow	<code>\upharpoonright</code>
\Downarrow	<code>\downupharpoons</code>	\rightarrow	<code>\rightharpoondown</code>	\Updownarrow	<code>\upupharpoons</code>
\Leftarrow	<code>\leftbarharpoon</code>	\rightarrow	<code>\rightharpoonup</code>		
\leftarrow	<code>\leftharpoondown</code>	\rightarrow	<code>\rightleftharpoon</code>		

TABLE 149: MnSymbol Arrows

\curvearrowdownup	<code>\curvearrowdownup</code>	\longleftarrow	<code>\longleftarrow</code>	\swarrow	<code>\rhookswarrow</code>
\curvearrowleftright	<code>\curvearrowleftright</code>	\Longleftarrow	<code>\Longleftarrow</code>	\uparrow	<code>\rhookuparrow</code>
\curvearrownesw	<code>\curvearrownesw</code>	\longleftrightarrow	<code>\longleftrightarrow</code>	\rightarrow	<code>\rightarrow</code>
\curvearrownsew	<code>\curvearrownsew</code>	\longleftrightarrow	<code>\longleftrightarrow</code>	\Rightarrow	<code>\Rightarrow</code>
\curvearrowrightleft	<code>\curvearrowrightleft</code>	\Longrightarrow	<code>\longmapsto</code>	\gg	<code>\rightarrowtail</code>
\curvearrowsenw	<code>\curvearrowsenw</code>	\longrightarrow	<code>\longrightarrow</code>	\Leftarrow	<code>\rightleftarrows</code>
\curvearrowswne	<code>\curvearrowswne</code>	\Longrightarrow	<code>\Longrightarrow</code>	\rightsquigarrow	<code>\rightlsquigarrow</code>
\curvearrowupdown	<code>\curvearrowupdown</code>	\looparrowleft	<code>\looparrowleft</code>	\mapsto	<code>\rightmapsto</code>
\dasheddownarrow	<code>\dasheddownarrow</code>	\looparrowright	<code>\looparrowright</code>	$\Rightarrow\Rightarrow$	<code>\rightrightarrows</code>
\dashedleftarrow	<code>\dashedleftarrow</code>	\Lsh		\rightsquigarrow	<code>\rightrsquigarrow</code>
\dashednearrow	<code>\dashednearrow</code>	\nearrow	<code>\nearrow</code>	$\Rightarrow\Rightarrow$	<code>\Rrightarrow</code>
\dashednarrow	<code>\dashednarrow</code>	\nearrow	<code>\Nearrow</code>	\rightarrow	<code>\Rsh</code>
\dashedrightarrow	<code>\dashedrightarrow</code>	\nearrowtail	<code>\nearrowtail</code>	\searrow	<code>\searrow</code>
\dashedsearrow	<code>\dashedsearrow</code>	\nearrow	<code>\nelsquigarrow</code>	\swarrow	<code>\Searrow</code>
\dashedswarrow	<code>\dashedswarrow</code>	\nearrow	<code>\nmapsto</code>	\nwarrowtail	<code>\searrowtail</code>
\dasheduparrow	<code>\dasheduparrow</code>	\nearrow	<code>\nenarrows</code>	\nwarrowtail	<code>\selsquigarrow</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\nersquigarrow</code>	\nwarrowtail	<code>\semapsto</code>
\downarrow	<code>\downarrow</code>	\nearrow	<code>\neswarrow</code>	\nwarrowtail	<code>\senarrows</code>
\downarrow	<code>\downarrow</code>	\nearrow	<code>\Neswarrow</code>	\nwarrowtail	<code>\sersquigarrow</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\neswarrows</code>	\nwarrowtail	<code>\sesarrows</code>
\downarrow	<code>\downarrow</code>	\nearrow	<code>\Neswarrows</code>	\nwarrowtail	<code>\squigarrowdownup</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\Nwarrow</code>	\nwarrowtail	<code>\squigarrowleftright</code>
\downarrow	<code>\downarrow</code>	\nearrow	<code>\Nwarrowtail</code>	\nwarrowtail	<code>\squigarrownesw</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\Nwlsquigarrow</code>	\nwarrowtail	<code>\squigarrownwse</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\Nwmapsto</code>	\nwarrowtail	<code>\squigarrowrightleft</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\Nwnwarrows</code>	\nwarrowtail	<code>\squigarrowsenw</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\Nwrsquigarrow</code>	\nwarrowtail	<code>\squigarrowswne</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\Nwsearrow</code>	\nwarrowtail	<code>\squigarrowupdown</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\Nwsearrow</code>	\nwarrowtail	<code>\swarrow</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\Nwsearrows</code>	\nwarrowtail	<code>\Swarrow</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\partialvardlcircleleftint*</code>	\nwarrowtail	<code>\swarrowtail</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\partialvardlcirclerightint*</code>	\nwarrowtail	<code>\swlsquigarrow</code>
\Downarrow	<code>\Downarrow</code>	\nearrow	<code>\partialvardrcircleleftint*</code>	\nwarrowtail	<code>\swmapsto</code>

(continued on next page)

(continued from previous page)

\lcurvearrowse	Q	\partial lvardrcirclerightint*	↖	\swnearrows
\lcurvearrowsw	○	\partial lvarlccircleleftint*	↙	\swrsquigarrow
\lcurvearrowup	○	\partial lvarlccirclerightint*	↖	\swwarrows
\Leftarrow	○	\partial lvartrccircleleftint*	↓	\twoheaddownarrow
\leftarrow	○	\partial lvartrccirclerightint*	←	\twoheadleftarrow
\leftarrowtail	○	\rcirclearrowdown	↗	\twoheadnearrow
\leftleftarrows	○	\rcirclearrowleft	↖	\twoheadnarrow
\leftlsquigarrow	○	\rcirclearrowright	→	\twoheadrightarrow
\leftmapsto	○	\rcirclearrowup	↘	\twoheadsearrow
\leftrightarrow	↳	\rcurvearrowdown	↖	\twoheadswarrow
\Leftrightarrow	↳	\rcurvearrowleft	↑	\twoheaduparrow
\leftrightarrowtail	↳	\rcurvearrowne	↑	\uparrow
\leftrightsquigarrow	↳	\rcurvearrownw	↑	\Uparrow
\lhookdownarrow	↳	\rcurvearrowright	↑	\uparrowtail
\lhookleftarrow	↳	\rcurvearrowse	↑	\updownarrow
\lhooknearrow	↳	\rcurvearrowsw	↓	\Updownarrow
\lhooknwarrow	↳	\rcurvearrowup	↑↓	\updownarrows
\lhookrightarrow	↓	\rhookdownarrow	↑	\uplsquigarrow
\lhooksearrow	↔	\rhookleftarrow	↑	\upmapsto
\lhookswarrow	↔	\rhooknearrow	↑	\upsrsquigarrow
\lhookuparrow	↔	\rhooknwarrow	↑↑	\upuparrows
\lightning	↔	\rhookrightarrow		
\Lleftarrow	↔	\rhooksearrow		

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>\lcirclearrowup</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>\rightlarrow</code>)
\leftrightarrow	<code>\leftrightarrow</code>	(same as <code>\leftarrowright</code>)
\mapsto	<code>\mapsto</code>	(same as <code>\rightarrowmap</code>)
\rightsquigarrow	<code>\rightsquigarrow</code>	(same as <code>\rightlarrow</code>)

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

TABLE 150: MnSymbol Negated Arrows

\ncurvearrowdownup	↗	\nlhooknwarrow	↗	\nrightleftarrows
\ncurvearrowleftright	↖	\nlhookrightarrow	↘	\nrightlsquigarrow
\ncurvearrownesw	↘	\nlhooksearrow	↗	\nrightmapsto
\ncurvearrownwse	↗	\nlhookswarrow	↗	\nrightrightarrows
\ncurvearrowrightleft	↑	\nlhookuparrow	↗	\nrightrsquigarrow
\ncurvearrowsenw	↖	\nLleftarrow	↗	\nRightarrow
\ncurvearrowsne	↗	\nnearrow	↘	\nSearrow
\ncurvearrowupdown	↗	\nNearrow	↘	\nsearrow
\ndasheddownarrow	↗	\nnarrowtail	↘	\nsearrowtail
\ndashedleftarrow	↗	\nnelsquigarrow	↘	\nselsquigarrow
\ndashednearrow	↗	\nnemapsto	↘	\nsemapsto
\ndashednarrow	↗	\nnenearrows	↘	\nsearrowars
\ndashedrightarrow	↗	\nnersquigarrow	↘	\nsersquigarrow
\ndashedsearrow	↗	\nNeswarrow	↘	\nsesearrows
\ndashedswarrow	↗	\nneswarrow	↘	\nsquigarrowdownup
\ndasheduparrow	↗	\nneswarrows	↖	\nsquigarrowleftright
\ndownarrow	↗	\nNarrow	↖	\nsquigarrownesw
\nDownarrow	↗	\nnarrow	↖	\nsquigarrownwse
\ndownarrowtail	↗	\nnarrowtail	↖	\nsquigarrowrightleft
\ndowndownarrows	↖	\nnwlsquigarrow	↖	\nsquigarrowsenw
\ndownlsquigarrow	↖	\nnwmapsto	↖	\nsquigarrowswne
\ndownmapsto	↖	\nnwnwarrows	↖	\nsquigarrowupdown
\ndownrsquigarrow	↖	\nnwrsquigarrow	↖	\nswarrow
\ndownuparrows	↖	\nnwsearrow	↖	\nSwarrow
\nlcirclearrowdown	↙	\nNwsearrow	↖	\nswarrowtail
\nlcirclearrowleft	↙	\nnwsearrows	↖	\nswlsquigarrow
\nlcirclearrowright	↙	\nrcirclearrowdown	↖	\nswmapsto
\nlcirclearrowup	↙	\nrcirclearrowleft	↖	\nswnearrows
\nlcurvearrowdown	↙	\nrcirclearrowright	↖	\nswrsquigarrow
\nlcurvearrowleft	↙	\nrcirclearrowup	↖	\nswswarrows
\nlcurvearrowne	↖	\nrcurvearrowdown	↓	\ntwoheaddownarrow
\nlcurvearrownw	↖	\nrcurvearrowleft	↖	\ntwoheadleftarrow
\nlcurvearrowright	↖	\nrcurvearrowne	↗	\ntwoheadnearrow
\nlcurvearrowse	↖	\nrcurvearrownw	↗	\ntwoheadnarrow
\nlcurvearrowsw	↖	\nrcurvearrowright	↗	\ntwoheadrightarrow
\nlcurvearrowup	↖	\nrcurvearrowse	↘	\ntwoheadsearrow
\nLeftarrow	↖	\nrcurvearrowsw	↘	\ntwoheadswarrow
\nleftarrow	↖	\nrcurvearrowup	↗	\ntwoheaduparrow
\nleftarrowtail	↖	\nrhookdownarrow	↑	\nuparrow
\nleftleftarrows	↖	\nrhookleftarrow	↑	\nUparrow
\nleftlsquigarrow	↖	\nrhooknearrow	↑	\nuparrowtail
\nleftmapsto	↖	\nrhooknwarrow	↑	\nupdownarrow
\nleftrightarrow	↖	\nrhookrightarrow	↑	\nUpdownarrow
\nLeftrightarrow	↖	\nrhooksearrow	↑	\nupdownarrows
\nleftrightarrows	↖	\nrhookswarrow	↑	\nuplsquigarrow
\nleftrsquigarrow	↖	\nrhookuparrow	↑	\nupmapsto
\nlhookdownarrow	↖	\nrightarrow	↑	\nuprsquigarrow

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\leftarrow	<code>\nlhookleftarrow</code>	\Rightarrow	<code>\nRightarrow</code>	\Updownarrow	<code>\nupuparrows</code>
\nearrow	<code>\nlhooknearrow</code>	$\Rightarrow\!\!\Rightarrow$	<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>\curvearrowleft</code>	(same as <code>\nrcurvearrowleft</code>)
\curvearrowright	<code>\curvearrowright</code>	(same as <code>\nlcurvearrowright</code>)
\dasharrow	<code>\ndasharrow</code>	(same as <code>\ndashedrightarrow</code>)
\dashleftarrow	<code>\dashleftarrow</code>	(same as <code>\dashedleftarrow</code>)
\dashrightarrow	<code>\dashrightarrow</code>	(same as <code>\dashedrightarrow</code>)
\leftarrowtail	<code>\nggets</code>	(same as <code>\nleftarrow</code>)
\leftarrowtail	<code>\nhookleftarrow</code>	(same as <code>\nrhookleftarrow</code>)
\leftarrowtail	<code>\nhookrightarrow</code>	(same as <code>\nlhookrightarrow</code>)
\leadsto	<code>\nleadsto</code>	(same as <code>\nrightsquigarrow</code>)
\leftrightsquigarrow	<code>\nleftrightsquigarrow</code>	(same as <code>\nsquigarrowleftright</code>)
\mapsto	<code>\nmapsto</code>	(same as <code>\nrightmapsto</code>)
\rightsquigarrow	<code>\rightsquigarrow</code>	(same as <code>\nrightlsquigarrow</code>)
\rightarrowtail	<code>\nto</code>	(same as <code>\nrightarrow</code>)

TABLE 151: MnSymbol Harpoons

\downarrow	<code>\downharpoonccw*</code>	\nearrow	<code>\neswharpoons</code>	\nwarrow	<code>\seharpooncw</code>
\downarrow	<code>\downharpooncw*</code>	\nearrow	<code>\neswharpoonsenw</code>	\nwarrow	<code>\senwharpoons</code>
\Downarrow	<code>\downupharpoons</code>	\nearrow	<code>\nwharpoonccw</code>	\swarrow	<code>\swharpoonccw</code>
\leftarrow	<code>\leftharpoonccw*</code>	\nwarrow	<code>\nwharpooncw</code>	\nearrow	<code>\swharpooncw</code>
\leftarrow	<code>\leftharpooncw*</code>	\nwarrow	<code>\nwseharpoonnesw</code>	\nearrow	<code>\swneharpoons</code>
\leftarrow	<code>\leftrightharpoondownup</code>	\nwarrow	<code>\nwseharpoons</code>	\uparrow	<code>\updownharpoonleftright</code>
\Leftarrow	<code>\leftrightharpoons</code>	\nwarrow	<code>\nwseharpoonsnwe</code>	\uparrow	<code>\updownharpoonrightleft</code>
\Leftarrow	<code>\leftrightharpoonupdown</code>	\rightarrow	<code>\rightharpoonccw*</code>	\Downarrow	<code>\updownharpoons</code>
\nearrow	<code>\neharpoonccw</code>	\rightarrow	<code>\rightharpooncw*</code>	\uparrow	<code>\upharpoonccw*</code>
\nearrow	<code>\neharpooncw</code>	$\Rightarrow\!\!\Rightarrow$	<code>\rightleftharpoons</code>	\uparrow	<code>\upharpooncw*</code>
\nearrow	<code>\neswharpoonnwse</code>	\nearrow	<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 152: MnSymbol Negated Harpoons

\dagger	<code>\ndownharpoonccw*</code>	\nexists	<code>\nneswharpoons</code>	\times	<code>\nseharpooncw</code>
\dagger	<code>\ndownharpooncw*</code>	\nexists	<code>\nneswharpoonsenw</code>	\nexists	<code>\nsenwharpoons</code>
\nexists	<code>\ndownupharpoons</code>	\nexists	<code>\nnwharpoonccw</code>	\nexists	<code>\nswharpoonccw</code>
\nexists	<code>\nleftharpoonccw*</code>	\nexists	<code>\nnwharpooncw</code>	\nexists	<code>\nswharpooncw</code>
\nexists	<code>\nleftharpooncw*</code>	\nexists	<code>\nnwseharpoonnesw</code>	\nexists	<code>\nswneharpoons</code>
\nexists	<code>\nleftrightharpoondownup</code>	\nexists	<code>\nnwseharpoons</code>	\nexists	<code>\nupdownharpoonleftright</code>
\nexists	<code>\nleftrightharpoons</code>	\nexists	<code>\nnwseharpoonswe</code>	\nexists	<code>\nupdownharpoonrightleft</code>
\nexists	<code>\nleftrightharpoonupdown</code>	\nexists	<code>\nrightharpoonccw*</code>	\nexists	<code>\nupdownharpoons</code>
\nexists	<code>\nnearharponecw</code>	\nexists	<code>\nrightharpooncw*</code>	\nexists	<code>\nupharpoonccw*</code>
\nexists	<code>\nnearharponecw</code>	\nexists	<code>\nrightleftharpoons</code>	\nexists	<code>\nupharpooncw*</code>
\nexists	<code>\nneswharpoonnwse</code>	\nexists	<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 153: fdsymbol Arrows

\circlearrowleft	<code>\acwcirclearrowdown</code>	\leftarrow	<code>\leftarrow</code>	\Rightarrow	<code>\rightrightarrow</code>
\circlearrowleft	<code>\acwcirclearrowleft</code>	\leftarrowtail	<code>\leftarrowtail</code>	\rightsquigarrow	<code>\rightwavearrow</code>
\circlearrowleft	<code>\acwcirclearrowright</code>	\leftarrowtail	<code>\leftarrowtail</code>	\Rrightarrow	<code>\Rrightarrow</code>
\circlearrowleft	<code>\acwcirclearrowup</code>	\leftarrowtail	<code>\leftarrowtail</code>	\Rsh	<code>\Rsh</code>
\leftarrowtail	<code>\acwlefttarcarrow</code>	\leftarrowtail	<code>\leftarrowtail</code>	\searrowtail	<code>\searrowtail</code>
\nearrowtail	<code>\acwnearcarrow</code>	\nearrowtail	<code>\nearrowtail</code>	\Searrowtail	<code>\Searrowtail</code>
\nwarrowtail	<code>\acwnwarcarrow</code>	\nwarrowtail	<code>\nwarrowtail</code>	\searrowtail	<code>\searrowtail</code>
$\overrightarrow{\wedge}$	<code>\acwoverarcarrow</code>	$\overrightarrow{\wedge}$	<code>\overrightarrow{\wedge}</code>	\searrowtail	<code>\searrowtail</code>
\nearrow	<code>\acwrighttarcarrow</code>	\nearrow	<code>\nearrow</code>	\Searrow	<code>\Searrow</code>
\nwarrow	<code>\acwsearcarrow</code>	\nwarrow	<code>\nwarrow</code>	\Searrow	<code>\Searrow</code>
\swarrowtail	<code>\acwsvarcarrow</code>	\swarrowtail	<code>\swarrowtail</code>	\searrowtail	<code>\searrowtail</code>
$\underbrace{\wedge}$	<code>\acwunderarcarrow</code>	$\underbrace{\wedge}$	<code>\underbrace{\wedge}</code>	\searrowtail	<code>\searrowtail</code>
\leftarrowtail	<code>\bdlefttarcarrow</code>	\leftarrowtail	<code>\leftarrowtail</code>	\swarrowtail	<code>\swarrowtail</code>
\nearrowtail	<code>\bdnearcarrow</code>	\nearrowtail	<code>\nearrowtail</code>	\swarrowtail	<code>\swarrowtail</code>
\nwarrowtail	<code>\bdnwarcarrow</code>	\nwarrowtail	<code>\nwarrowtail</code>	\swarrowtail	<code>\swarrowtail</code>
$\overrightarrow{\wedge}$	<code>\bdovertarcarrow</code>	$\overrightarrow{\wedge}$	<code>\overrightarrow{\wedge}</code>	\swarrowtail	<code>\swarrowtail</code>
\nearrow	<code>\bdrighttarcarrow</code>	\nearrow	<code>\nearrow</code>	\twoheaddownarrow	<code>\twoheaddownarrow</code>
\nwarrow	<code>\bdsearcarrow</code>	\nwarrow	<code>\nwarrow</code>	\twoheadleftarrow	<code>\twoheadleftarrow</code>
\swarrowtail	<code>\bdswarcarrow</code>	\swarrowtail	<code>\swarrowtail</code>	\twoheadnearrow	<code>\twoheadnearrow</code>
$\underbrace{\wedge}$	<code>\bdunderarcarrow</code>	$\underbrace{\wedge}$	<code>\underbrace{\wedge}</code>	\twoheadnarrow	<code>\twoheadnarrow</code>
\circlearrowleft	<code>\cwcirclearrowdown</code>	\Rightarrow	<code>\Longmapsto</code>	\Rightarrow	<code>\twoheadrightarrow</code>
\circlearrowleft	<code>\cwcirclearrowleft</code>	\Rightarrow	<code>\Longmapsto</code>	\Rightarrow	<code>\twoheadsearrow</code>
\circlearrowleft	<code>\cwcirclearrowright</code>	\Rightarrow	<code>\Longrightarrow</code>	\Rightarrow	<code>\twoheadswarrow</code>
\circlearrowleft	<code>\cwcirclearrowup</code>	\Rightarrow	<code>\Longrightarrow</code>	\Rightarrow	<code>\twoheaduparrow</code>
\nearrowtail	<code>\cwlefttarcarrow</code>	\nearrowtail	<code>\nearrowtail</code>	\uparrow	<code>\uparrow</code>
\nwarrowtail	<code>\cwnearcarrow</code>	\nwarrowtail	<code>\nwarrowtail</code>	\uparrow	<code>\uparrow</code>

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↶	\cwnwararrow	↖	\looparrowright	↑	\uparrowarrowtail
↷	\cwoverarcarrow	↙	\Lsh	↑	\upbkarrow
⤷	\cwrightarcarrow	↗	\nearrow	↕	\Updownarrow
⤸	\cwsearcarrow	⤹	\Nearrow	⤻	\updownarrow
⤹	\cwswararrow	⤺	\nearrowtail	⤻	\updownarrows
⤻	\cwunderarcarrow	⤻	\nebkarrow	⤻	\updownwavearrow
⤻	\Ddownarrow	⤻	\nenearrows	⤻	\upmapsto
⤻	\Downarrow	⤻	\Neswarrow	⤻	\Upmapsto
⤻	\downarrow	⤻	\neswarrow	⤻	\upuparrows
⤻	\downarrowtail	⤻	\neswarrows	⤻	\upwavearrow
⤻	\downbkarrow	⤻	\Nwarrow	⤻	\Uparrow
⤻	\downdownarrows	⤻	\narrow	⤻	\vardownwavearrow
⤻	\Downmapsto	⤻	\narrowtail	⤻	\varhookdownarrow
⤻	\downmapsto	⤻	\nwbkarrow	⤻	\varhookleftarrow
⤻	\downuparrows	⤻	\nnwarrows	⤻	\varhooknearrow
⤻	\downwavearrow	⤻	\Nwsearrow	⤻	\varhooknarrow
⤻	\hookdownarrow	⤻	\nwsearrow	⤻	\varhookrightarrow
⤻	\hookleftarrow	⤻	\nwsearrows	⤻	\varhooksearrow
⤻	\hooknearrow	⤻	\Rdsh	⤻	\varhookswarrow
⤻	\hooknarrow	⤻	\Rightarrow	⤻	\varhookuparrow
⤻	\hookrightarrow	⤻	\rightarrow	⤻	\varleftrightwavearrow
⤻	\hooksearrow	⤻	\rightarrowtail	⤻	\varleftwavearrow
⤻	\hookswarrow	⤻	\rightbkarrow	⤻	\varrightwavearrow
⤻	\hookuparrow	⤻	\rightleftarrows	⤻	\varupdownwavearrow
⤻	\Ldsh	⤻	\Rightmapsto	⤻	\varupwavearrow
⤻	\Leftarrow	⤻	\rightmapsto	⤻	

fdsymbol defines synonyms for most of the preceding symbols:

↺	\acwgpcirclearrow	⤻	\leftrightsquigarrow	⤻	\rhooknarrow
↺	\acwopencirclearrow	⤻	\leftrsquigarrow	⤻	\rhookrightarrow
↺	\circlearrowleft	⤻	\leftsquigarrow	⤻	\rhooksearrow
↺	\circlearrowright	⤻	\leftupcurvedarrow	⤻	\rhookswarrow
⤻	\curvearrowleft	⤻	\lhookdownarrow	⤻	\rhookuparrow
⤻	\curvearrowright	⤻	\lhookleftarrow	⤻	\rightcurvedarrow
⟳	\cgapccirclearrow	⤻	\lhooknearrow	⤻	\rightdowncurvedarrow
⟳	\cwopencirclearrow	⤻	\lhooknarrow	⤻	\rightlcurvearrow
⤻	\dasharrow	⤻	\lhookrightarrow	⤻	\rightleftcurvearrow
⤻	\dashleftarrow	⤻	\lhooksearrow	⤻	\rightleftsquigarrow
⤻	\dashrightarrow	⤻	\lhookswarrow	⤻	\rightlsquigarrow
⤻	\downlcurvearrow	⤻	\lhookuparrow	⤻	\rightrcurvearrow
⤻	\downleftcurvedarrow	⤻	\longleadsto	⤻	\rightrsquigarrow
⤻	\downlsquigarrow	⤻	\longleftsquigarrow	⤻	\rightsquigarrow
⤻	\downrcurvearrow	⤻	\longrightsquigarrow	⤻	\rightupcurvedarrow
⤻	\downrightcurvedarrow	⤻	\mapsdown	⤻	\selcurvearrow
⤻	\downrsquigarrow	⤻	\Mapsdown	⤻	\senwcurvearrow
⤻	\downupcurvearrow	⤻	\mapsfrom	⤻	\sercurvearrow
⤻	\downupsquigarrow	⤻	\Mapsfrom	⤻	\swlcurvearrow
⤻	\downzigzagarrow	⤻	\mapsto	⤻	\swnecurvearrow

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\leftarrow	\gets	\Rightarrow	\Mapsto	\curvearrowleft	\swrcurvearrow
\nwarrow	\hknarrow	\uparrow	\mapsup	\rightarrow	\to
\nearrow	\hknarrow	\Downarrow	\Mapsup	\Downarrow	\updowncurvearrow
\searrow	\hksearrow	\curvearrowright	\nelcurvearrow	\Downarrow	\updownsquigarrow
\swarrow	\hksarrow	\curvearrowleft	\nercurvearrow	\curvearrowleft	\uplcurvearrow
\rightsquigarrow	\leadsto	$\curvearrowleft\curvearrowright$	\neswcurvearrow	$\curvearrowleft\curvearrowright$	\uleftcurvedarrow
\leftarrowtail	\leftcurvedarrow	\curvearrowleft	\nlcurvearrow	\curvearrowleft	\uplsquigarrow
\leftarrowtail	\leftdowncurvedarrow	\curvearrowleft	\nwrcurvearrow	\curvearrowleft	\uprcurvearrow
\leftarrowtail	\leftlcurvearrow	\curvearrowleft	\nwsecurvearrow	\curvearrowleft	\uprightcurvearrow
\leftarrowtail	\leftlsquigarrow	\curvearrowleft	\rhookdownarrow	\curvearrowleft	\uprsquigarrow
\leftarrowtail	\leftrccurvearrow	\curvearrowleft	\rhookleftarrow		
\leftarrowtail	\leftrightcurvearrow	\curvearrowleft	\rhooknearrow		

TABLE 154: *fdsymbol* Negated Arrows

\nexists	\nacwcirclearrowdown	$\not\leftarrow$	\nleftarrow	$\not\Rightarrow$	\nRightarrow
\nexists	\nacwcirclearrowleft	$\not\Leftarrow$	\nLeftarrow	$\not\Leftarrow$	\nSearrow
\nexists	\nacwcirclearrowright	$\not\leftarrowtail$	\nleftarrowtail	$\not\Leftarrowtail$	\nSearrow
\nexists	\nacwcirclearrowup	$\not\leftarrow\!\!\!\leftarrow$	\nleftbkarrow	$\not\leftarrow\!\!\!\leftarrow$	\nsearrowtail
\nexists	\nacwleftarcarrow	$\not\#$	\nleftleftarrows	$\not\#$	\nsebkarw
\nexists	\nacwnearcarrow	$\not\#$	\nleftmapsto	$\not\#$	\nsenwarrows
\nexists	\nacwnwarcarrow	$\not\#$	\nLeftmapsto	$\not\#$	\nsesearrows
\nexists	\nacwoverarcarrow	$\not\#$	\nleftrightarrow	$\not\#$	\nswarrow
\nexists	\nacwrightarcarrow	$\not\#$	\nLeftrightarrow	$\not\#$	\nSwarrow
\nexists	\nacwsearcarrow	$\not\#$	\nleftrightarrows	$\not\#$	\nswarrowtail
\nexists	\nacwswarcarrow	$\not\#$	\nleftrightwavearrow	$\not\#$	\nswbkarw
\nexists	\nacwunderarcarrow	$\not\#$	\nleftwavearrow	$\not\#$	\nswnearrows
\nexists	\nbdbleftarcarrow	$\not\#$	\nLeftarrow	$\not\#$	\nswswarrows
\nexists	\nbdbnearcarrow	$\not\#$	\nlongleftarrow	$\not\#$	\ntwoheaddownarrow
\nexists	\nbdbnwarcarrow	$\not\#$	\nLongleftarrow	$\not\#$	\ntwoheadleftarrow
\nexists	\nbdboverarcarrow	$\not\#$	\nlongleftrightarrow	$\not\#$	\ntwoheadnearrow
\nexists	\nbdbrightarcarrow	$\not\#$	\nLongleftrightarrow	$\not\#$	\ntwoheadnarrow
\nexists	\nbdssearcarrow	$\not\sim\sim$	\nlongleftwavearrow	$\not\sim\sim$	\ntwoheadrightarrow
\nexists	\nbdswarccarw	$\not\#$	\nlongmapsfrom	$\not\#$	\ntwoheadsearrow
\nexists	\nbdunderarcarrow	$\not\#$	\nLongmapsfrom	$\not\#$	\ntwoheadswarrow
\nexists	\ncwcirclearrowdown	$\not\rightarrow\!\!\!\rightarrow$	\nlongmapsto	$\not\#$	\ntwoheaduparrow
\nexists	\ncwcirclearrowleft	$\not\#$	\nLongmapsto	$\not\#$	\nuparrow
\nexists	\ncwcirclearrowright	$\not\rightarrow\!\!\!\rightarrow$	\nlongrightarrow	$\not\#$	\nUparrow
\nexists	\ncwcirclearrowup	$\not\#$	\nLongrightarrow	$\not\#$	\nuparrowtail
\nexists	\ncwleftarcarrow	$\not\sim\sim$	\nlongrightwavearrow	$\not\sim\sim$	\nupbkarw
\nexists	\ncwnearcarrow	$\not\#$	\nnearrow	$\not\#$	\nupdownarrow
\nexists	\ncwnwarcarrow	$\not\#$	\nNearrow	$\not\#$	\nUpdownarrow
\nexists	\ncwoverarcarrow	$\not\#$	\nnearrowtail	$\not\#$	\nupdownarrows

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↶	\ncwrightarcarrow	↷	\nnebkarrow	⤳	\nupdownwavearrow
⤲	\ncwsearcarrow	⤴	\nnenarrows	⤵	\nupmapsto
⤳	\ncswarcarrow	⤵	\nneswarrow	⤶	\nUmapsto
⤷	\ncwunderarcarrow	⤷	\nNeswarrow	⤸	\nupuparrows
⤹	\nDdownarrow	⤸	\nneswarrows	⤹	\nupwavearrow
⤻	\ndownarrow	⤺	\nnwarrow	⤻	\nUparrow
⤼	\nDownarrow	⤻	\nNwarrow	⤼	\nvardownwavearrow
⤽	\ndownarrowtail	⤽	\nnarrowtail	⤽	\nvarhookdownarrow
⤾	\ndownbkarrown	⤾	\nnwbkarrown	⤾	\nvarhookleftarrow
⤿	\ndowndownarrows	⤿	\nnwnarrows	⤿	\nvarhooknearrow
⤻	\ndownmapsto	⤻	\nnsearrow	⤻	\nvarhooknarrow
⤼	\nDownmapsto	⤼	\nNsearrow	⤼	\nvarhookrightarrow
⤽	\ndownuparrows	⤽	\nnsearrows	⤽	\nvarhooksearrow
⤹	\ndownwavearrow	⤹	\nrightarrow	⤹	\nvarhookswarrow
⤻	\nhookdownarrow	⤻	\nRightarrow	⤻	\nvarhookuparrow
⤾	\nhookleftarrow	⤾	\nrightarrowtail	⤾	\nvarleftrightwavearrow
⤽	\nhooknearrow	⤽	\nrightbkarrown	⤽	\nvarleftwavearrow
⤼	\nhooknarrow	⤼	\nrightleftarrows	⤼	\nvarrightwavearrow
⤻	\nhookrightarrow	⤻	\nrightmapsto	⤻	\nvarupdownwavearrow
⤼	\nhooksearrow	⤼	\nRightmapsto	⤼	\nvarupwavearrow
⤽	\nhookswarrow	⤽	\nrightrightarrows		
⤹	\nhookuparrow	⤹	\nrightwavearrow		

fdsymbol defines synonyms for most of the preceding symbols:

⌚	\nacwgapcirclearrow	⌚	\nleftdowncurvedarrow	⌚	\nrightcurvedarrow
⌚	\nacwopencirclearrow	⌚	\nleftlcurvearrow	⌚	\nrightdowncurvedarrow
⌚	\ncirclearrowleft	⌚	\nleftlsquigarrow	⌚	\nrightlcurvearrow
⌚	\ncirclearrowright	⌚	\nlefrtrcurvearrow	⌚	\nrightleftcurvearrow
⌚	\ncurvearrowleft	⌚	\nleftrightcurvearrow	⌚	\nrightleftsquigarrow
⌚	\ncurvearrowright	⌚	\nleftrightsquigarrow	⌚	\nrightlsquigarrow
⌚	\ncwgapcirclearrow	⌚	\nleftrsquigarrow	⌚	\nrightrcurvearrow
⌚	\nacwopencirclearrow	⌚	\nleftsquigarrow	⌚	\nrightrsquigarrow
⤻	\ndasharrow	⤻	\nleftupcurvedarrow	⤻	\nrightsquigarrow
⤻	\ndashleftarrow	⤻	\nlongleadsto	⤻	\nrightupcurvedarrow
⤻	\ndashrightarrow	⤻	\nlongleftsquigarrow	⤻	\nsecurvearrow
⤻	\ndownlcurvearrow	⤻	\nlongrightsquigarrow	⤻	\nsenwcurvearrow
⤻	\downleftcurvedarrow	⤻	\nmapsdown	⤻	\nscurvearrow
⤻	\downlsquigarrow	⤻	\nMapsdown	⤻	\nswlcurvearrow
⤻	\downrcurvearrow	⤻	\nmapsfrom	⤻	\nswnecurvearrow
⤻	\downrightcurvedarrow	⤻	\nMapsfrom	⤻	\nswrcurvearrow
⤻	\downrsquigarrow	⤻	\nmapsto	⤻	\npto
⤻	\downupcurvearrow	⤻	\nMapsto	⤻	\nupdowncurvearrow
⤻	\downupsquigarrow	⤻	\nmapsup	⤻	\nupdownsquigarrow
⤻	\ngets	⤻	\nMapsup	⤻	\nuplcurvearrow
⤻	\nhknearrow	⤻	\nnelcurvearrow	⤻	\npleftcurvedarrow
⤻	\nhknarrow	⤻	\nnercurvearrow	⤻	\nplsquigarrow
⤻	\nhksearrow	⤻	\nneswcurvearrow	⤻	\nprcurvearrow
⤻	\nhkswarrow	⤻	\nnwlcurvearrow	⤻	\nuprightcurvearrow

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\nwarrow	<code>\nleadsto</code>	\nwarrow	<code>\nnwrcurvearrow</code>	\nwarrow	<code>\nuprsquigarrow</code>
$\leftarrow\downarrow$	<code>\leftarrow\downarrow</code>	\nwarrow	<code>\nnwsecurvearrow</code>		

TABLE 155: *fdsymbol* Harpoons

\downarrow	<code>\downharpoonleft</code>	\nearrow	<code>\neswharpoons</code>	\searrow	<code>\seharpoonsw</code>
\downarrow	<code>\downharpoonright</code>	\nearrow	<code>\neswharpoonsenw</code>	\nwarrow	<code>\senwharpoons</code>
\Downarrow	<code>\downupharpoons</code>	\nwarrow	<code>\nwharpoonne</code>	\swarrow	<code>\swharpoonnw</code>
\leftarrow	<code>\leftharpoondown</code>	\nwarrow	<code>\nwharpoonsw</code>	\swarrow	<code>\swharpoonse</code>
\leftarrow	<code>\leftharpoonup</code>	\nwarrow	<code>\nwseharpoonnesw</code>	\nwarrow	<code>\swneharpoons</code>
$\leftarrow\rightarrow$	<code>\leftrightharpoondownup</code>	\nwarrow	<code>\nwseharpoons</code>	\uparrow	<code>\updownharpoonleftright</code>
$\Leftarrow\rightarrow$	<code>\leftrightharpoons</code>	\nwarrow	<code>\nwseharpoonswne</code>	\uparrow	<code>\updownharpoonrightleft</code>
$\leftarrow\rightarrow$	<code>\leftrightharpoonupdown</code>	\rightarrow	<code>\rightharpoondown</code>	\uparrow	<code>\updownharpoons</code>
\nearrow	<code>\neharpoonnw</code>	\rightarrow	<code>\rightharpoonup</code>	\uparrow	<code>\upharpoonleft</code>
\nearrow	<code>\neharpoonse</code>	\Rightarrow	<code>\rightleftharpoons</code>	\uparrow	<code>\upharpoonright</code>
\nearrow	<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 156: *fdsymbol* Negated Harpoons

$\not\downarrow$	<code>\ndownharpoonleft</code>	$\not\nearrow$	<code>\nneswharpoons</code>	$\not\searrow$	<code>\nseharpoonsw</code>
$\not\downarrow$	<code>\ndownharpoonright</code>	$\not\nearrow$	<code>\nneswharpoonsenw</code>	$\not\nwarrow$	<code>\nsenwharpoons</code>
$\not\Downarrow$	<code>\downupharpoons</code>	$\not\nwarrow$	<code>\nnwharpoonne</code>	$\not\swarrow$	<code>\nswharpoonnw</code>
$\not\leftarrow$	<code>\leftharpoondown</code>	$\not\nwarrow$	<code>\nnwharpoonsw</code>	$\not\swarrow$	<code>\nswharpoonse</code>
$\not\leftarrow$	<code>\leftharpoonup</code>	$\not\nwarrow$	<code>\nnwseharpoonnesw</code>	$\not\nwarrow$	<code>\nswneharpoons</code>
$\not\leftarrow\rightarrow$	<code>\leftrightharpoondownup</code>	$\not\nwarrow$	<code>\nnwseharpoons</code>	$\not\uparrow$	<code>\updownharpoonleftright</code>
$\not\Leftarrow\rightarrow$	<code>\leftrightharpoons</code>	$\not\nwarrow$	<code>\nnwseharpoonswne</code>	$\not\uparrow$	<code>\updownharpoonrightleft</code>
$\not\leftarrow\rightarrow$	<code>\leftrightharpoonupdown</code>	$\not\rightarrow$	<code>\rightharpoondown</code>	$\not\uparrow$	<code>\updownharpoons</code>
$\not\nearrow$	<code>\neharpoonnw</code>	$\not\rightarrow$	<code>\rightharpoonup</code>	$\not\uparrow$	<code>\upharpoonleft</code>
$\not\nearrow$	<code>\neharpoonse</code>	$\not\Rightarrow$	<code>\rightleftharpoons</code>	$\not\uparrow$	<code>\upharpoonright</code>
$\not\nearrow$	<code>\nneswharpoonnwse</code>	$\not\searrow$	<code>\seharpoonne</code>		

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

TABLE 157: boisik Arrows

\leftarrow	<code>\barleftarrow</code>	\uparrow	<code>\Lsh</code>
\nwarrow	<code>\barleftarrowrightarrowbar</code>	\downarrow	<code>\mapsdown</code>
\nearrow	<code>\barovernorthwestarrow</code>	\Leftrightarrow	<code>\Mapsfrom</code>
\leftarrow	<code>\carriagereturn</code>	\Leftarrow	<code>\mapsfrom</code>
\circlearrowleft	<code>\circlearrowleft</code>	\Rightarrow	<code>\Mapsto</code>
\circlearrowright	<code>\circlearrowright</code>	\rightarrowtail	<code>\mapsto</code>
\cuparrow	<code>\cupleftarrow</code>	\uparrow	<code>\mapsup</code>
\curlyveedownarrow	<code>\curlyveedownarrow</code>	\nearrow	<code>\Nearrow</code>
\curlyveeuparrow	<code>\curlyveeuparrow</code>	\swarrow	<code>\nearrowcorner</code>
\curlywedgearrow	<code>\curlywedgearrow</code>	\nearrow	<code>\nnearrow</code>
\curvearrowbotleft	<code>\curvearrowbotleft</code>	\nearrow	<code>\nnarrow</code>
\curvearrowbotleftright	<code>\curvearrowbotleftright</code>	\nearrow	<code>\Narrow</code>
\curvearrowbotright	<code>\curvearrowbotright</code>	\nearrow	<code>\narrowcorner</code>
\curvearrowleft	<code>\curvearrowleft</code>	\rightarrowtail	<code>\rightarrowbar</code>
\curvearrowleftright	<code>\curvearrowleftright</code>	\rightarrowtail	<code>\rightarrowcircle</code>
\curvearrowright	<code>\curvearrowright</code>	\rightarrowtail	<code>\rightarrowtail</code>
\dsh	<code>\dsh</code>	\rightarrowtail	<code>\rightarrowTriangle</code>
\downblackarrow	<code>\downblackarrow</code>	\rightarrowtail	<code>\rightarrowtriangle</code>
\downdasharrow	<code>\downdasharrow</code>	\rightarrowtail	<code>\rightblackarrow</code>
\downdownarrows	<code>\downdownarrows</code>	\rightarrowtail	<code>\rightdasharrow</code>
\downtuparrow	<code>\downtuparrow</code>	\rightarrowtail	<code>\rightleftarrows</code>
\downwhitearrow	<code>\downwhitearrow</code>	\rightarrowtail	<code>\rightrightarrows</code>
\downzigzagarrow	<code>\downzigzagarrow</code>	\rightarrowtail	<code>\rightsquigarrow</code>
\drsh	<code>\drsh</code>	\rightarrowtail	<code>\rightthreearrows</code>
\eqleftrightarrow	<code>\eqleftrightarrow</code>	\rightarrowtail	<code>\righttoleftarrow</code>
\hookleftarrow	<code>\hookleftarrow</code>	\rightarrowtail	<code>\rightwhitearrow</code>
\hookrightarrow	<code>\hookrightarrow</code>	\rightarrowtail	<code>\rightwhiteroundarrow</code>
\leftarrowtail	<code>\leftarrowtail</code>	\rightarrowtail	<code>\Rrightarrow</code>
\leftarrowtriangle	<code>\leftarrowtriangle</code>	\rightarrowtail	<code>\Rsh</code>
\leftblackarrow	<code>\leftblackarrow</code>	\rightarrowtail	<code>\Searrow</code>
\leftdasharrow	<code>\leftdasharrow</code>	\rightarrowtail	<code>\ssarrow</code>
\leftleftarrows	<code>\leftleftarrows</code>	\rightarrowtail	<code>\sswarrow</code>
\leftrightrightarroweq	<code>\leftrightrightarroweq</code>	\rightarrowtail	<code>\Swarrow</code>
\leftrightharrows	<code>\leftrightharrows</code>	\rightarrowtail	<code>\twoheaddownarrow</code>
$\leftrightharpoonuptriangle$	<code>\leftrightharpoonuptriangle</code>	\rightarrowtail	<code>\twoheadleftarrow</code>
$\leftrightharpoonuptriangle$	<code>\leftrightharpoonuptriangle</code>	\rightarrowtail	<code>\twoheadrightarrow</code>
$\leftrightharpoonupblackarrow$	<code>\leftrightharpoonupblackarrow</code>	\rightarrowtail	<code>\twoheaduparrow</code>
\leftrightsquigarrow	<code>\leftrightsquigarrow</code>	\rightarrowtail	<code>\twoheadwhiteuparrow</code>
\lefttorightarrow	<code>\lefttorightarrow</code>	\rightarrowtail	<code>\twoheadwhiteuparrowpedestal</code>
\leftwhitearrow	<code>\leftwhitearrow</code>	\rightarrowtail	<code>\upblackarrow</code>
\leftwhiteroundarrow	<code>\leftwhiteroundarrow</code>	\rightarrowtail	<code>\updasharrow</code>
\leftzigzagarrow	<code>\leftzigzagarrow</code>	\rightarrowtail	<code>\updownarrowbar</code>
\linefeed	<code>\linefeed</code>	\rightarrowtail	<code>\updownblackarrow</code>
\Lleftarrow	<code>\Lleftarrow</code>	\rightarrowtail	<code>\updownwhitearrow</code>
		\rightarrowtail	<code>\uptodownarrow</code>
		\rightarrowtail	<code>\upuparrows</code>
		\rightarrowtail	<code>\upwhitearrow</code>

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\leftarrow	<code>\looparrowdownleft</code>	\uparrow	<code>\whitearrowupfrombar</code>
\rightarrow	<code>\looparrowdownright</code>	\downarrow	<code>\whitearrowuppedestal</code>
\nwarrow	<code>\looparrowleft</code>	\updownarrow	<code>\whitearrowuppedestalhbar</code>
\nearrow	<code>\looparrowright</code>	\updownarrow	<code>\whitearrowuppedestalvbar</code>

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

TABLE 158: `boisik` Negated Arrows

\nexists	<code>\nHdownarrow</code>	\Leftrightarrow	<code>\nLeftrightarrow</code>	\Rightarrow	<code>\nRightarrow</code>
\nexists	<code>\nHuparrow</code>	\Leftrightarrow	<code>\nLeftrightarrow</code>	\Leftarrow	<code>\nLeftarrow</code>
\nLeftarrow	<code>\nLeftarrow</code>	\Leftrightarrow	<code>\nLeftrightarrow</code>	\Rightarrow	<code>\nRightarrow</code>
\nLeftarrow	<code>\nleftarrow</code>	\Rightarrow	<code>\nrightarrow</code>		

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

TABLE 159: `boisik` Harpoons

\downarrow	<code>\downharpoonleft</code>	\Leftarrow	<code>\leftrightharpoons</code>	\uparrow	<code>\upharpoonleft</code>
\downarrow	<code>\downharpoonright</code>	\rightarrow	<code>\rightharpoonondown</code>	\uparrow	<code>\upharpoonright</code>
\leftarrow	<code>\leftharpoonondown</code>	\rightarrow	<code>\rightharpoononup</code>		
\leftarrow	<code>\leftharpoonup</code>	\Rightarrow	<code>\rightleftharpoons</code>		

TABLE 160: `stix` Arrows

\circlearrowleft	<code>\acwcirclearrow</code>	\longrightarrow	<code>\longmapsto</code>
\circlearrowright	<code>\acwgapcirclearrow</code>	\Longrightarrow	<code>\Longmapsto</code>
\curvearrowleft	<code>\acwleftarcarrow</code>	\rightarrowtail	<code>\longrightarrowtail</code>
\curvearrowright	<code>\acwoverarcarrow</code>	\Longrightarrow	<code>\Longrightarrowtail</code>
\curvearrowup	<code>\acwunderarcarrow</code>	\rightsquigarrow	<code>\longrightsquigarrow</code>
\leftarrowtail	<code>\barleftarrow</code>	\Leftrightarrow	<code>\looparrowleft</code>
\leftarrowtail	<code>\barleftarrowrightarrowbar^*</code>	\Rrightarrow	<code>\looparrowright</code>
\leftarrowtail	<code>\barrightarrowdiamond</code>	\lsh	<code>\Lsh</code>
\uparrowtail	<code>\baruparrow</code>	\downarrowtail	<code>\mapsdown</code>
\leftarrowtail	<code>\bsimilarcharrow</code>	\Leftrightarrow	<code>\Mapsfrom</code>
\leftarrowtail	<code>\bsimilarcharrow</code>	\Leftrightarrow	<code>\Mapsfrom</code>
\leftarrowtail	<code>\carriagereturn^*</code>	\rightarrowtail	<code>\mapsto</code>
\curvearrowup	<code>\ccwundercurvearrow</code>	\Rightarrowtail	<code>\Mapsto</code>
\circlearrowleft	<code>\circlearrowleft</code>	\uparrowtail	<code>\mapsup</code>
\circlearrowright	<code>\circlearrowright</code>	$\not\Rightarrowtail$	<code>\Nearrow</code>

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\Leftarrow	<code>\circleonleftarrow</code>	\nearrow	<code>\nearrow</code>
\Rightarrow	<code>\circleonrightarrow</code>	\nwarrow	<code>\neovnarrow*</code>
\curvearrowleft	<code>\curvearrowleft</code>	\swarrow	<code>\neovsearrow*</code>
\curvearrowleftplus	<code>\curvearrowleftplus</code>	$\nearrow\swarrow$	<code>\neswarrow</code>
\curvearrowright	<code>\curvearrowright</code>	$\nwarrow\swarrow$	<code>\narrow</code>
\curvearrowrightminus	<code>\curvearrowrightminus</code>	$\nearrow\swarrow\swarrow$	<code>\Narrow</code>
\circlearrowleft	<code>\cwccirclearrow</code>	$\nearrow\swarrow\swarrow\swarrow$	<code>\nwovnearrow*</code>
\circlearrowright	<code>\cwgapccirclearrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow$	<code>\nwsearrow</code>
\curvearrowright	<code>\cwrighttarcarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rdiagovsearrow*</code>
\curvearrowleft	<code>\cwundercurvearrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\Rdsh</code>
\rightarrowtail	<code>\dbkarow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\Rightarrow</code>
\Downarrow	<code>\DDownarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrow</code>
\Downarrow	<code>\Ddownarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowapprox</code>
\leftarrowtail	<code>\diamondleftarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowbackapprox</code>
\leftarrowtail	<code>\diamondleftarrowbar</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowbar</code>
\downarrow	<code>\downarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowbsimilar</code>
\Downarrow	<code>\Downarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowdiamond</code>
\downarrow	<code>\downarrowbar</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowonoplus</code>
\downarrow	<code>\downarrowbarred</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowplus</code>
\Downarrow	<code>\downdasharrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowshortleftarrow</code>
\Downarrow	<code>\downdownarrows</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowsimilar</code>
\rightarrowtail	<code>\downrightcurvedarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowtail</code>
$\uparrow\downarrow$	<code>\downuparrows</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowtriangle</code>
\Downarrow	<code>\downwhitearrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightarrowx</code>
\Downarrow	<code>\downzigzagarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightbkarow</code>
\rightarrowtail	<code>\draftingarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightcurvedarrow</code>
\rightarrowtail	<code>\drbkarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightdasharrow*</code>
\Leftarrowtail	<code>\equalleftarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightdotarrow</code>
\Rightarrowtail	<code>\equalrightarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightdowncurvedarrow</code>
\nwarrow	<code>\fdiagovnearrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightleftarrows</code>
\nearrow	<code>\hknearrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightrightarrows</code>
\nearrow	<code>\hknarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightsquigarrow</code>
\nearrow	<code>\hksearrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightthreearrows</code>
\nearrow	<code>\hkswarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightwavearrow</code>
\hookleftarrow	<code>\hookleftarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\rightwhitearrow*</code>
\hookrightarrow	<code>\hookrightarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\RRightarrow</code>
\Lsh	<code>\Ldsh</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\Rightarrow</code>
\leftarrowtail	<code>\leftarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\Rsh</code>
\Leftarrowtail	<code>\Leftarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\searrow</code>
\Leftarrowtail	<code>\leftarrowapprox</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\Searrow</code>
\Leftarrowtail	<code>\leftarrowbackapprox</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\seovnearrow*</code>
\Leftarrowtail	<code>\leftarrowbsimilar</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\shortrightarrowleftarrow</code>
\oplus	<code>\leftarrowonoplus</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\similarleftarrow</code>
\Leftarrowtail	<code>\leftarrowplus</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\similarrightarrow</code>
\Leftarrowtail	<code>\leftarrowshortrightarrow</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\swarrow</code>
\Leftarrowtail	<code>\leftarrowsimilar</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\Swarrow</code>
\Leftarrowtail	<code>\leftarrowtail</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\toea</code>
\Leftarrowtail	<code>\leftarrowtriangle</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\tona</code>
\Leftarrowtail	<code>\leftarrowx</code>	$\nearrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow\swarrow$	<code>\tosa</code>

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\leftarrow	<code>\leftbkarrow</code>	\times	<code>\towa</code>
\leftarrow	<code>\leftcurvedarrow</code>	\downarrow	<code>\twoheaddownarrow</code>
\leftleftarrows	<code>\leftdasharrow^*</code>	\leftarrow	<code>\twoheadleftarrow</code>
\leftleftarrows	<code>\leftdbkarrow</code>	\leftleftarrow	<code>\twoheadleftarrowtail</code>
\leftleftarrows	<code>\leftdotarrow</code>	\leftleftleftarrow	<code>\twoheadleftdbkarrow</code>
\leftleftarrows	<code>\leftdowncurvedarrow</code>	\leftleftarrow	<code>\twoheadmapsfrom</code>
\leftleftarrows	<code>\leftleftarrows</code>	\rightarrowtail	<code>\twoheadmapsto</code>
\leftleftarrows	<code>\Leftrightarrow</code>	\Rightarrowtail	<code>\twoheadrightarrow</code>
\leftleftarrows	<code>\Leftrightarrow</code>	\Rightarrowtail	<code>\twoheadrightarrowtail</code>
\leftleftarrows	<code>\leftrightarrowcircle</code>	\uparrow	<code>\twoheaduparrow</code>
\leftleftarrows	<code>\leftrightarrows</code>	\uparrow	<code>\twoheaduparrowcircle</code>
\leftleftarrows	<code>\leftrightarrowtriangle</code>	\uparrow	<code>\uparrow</code>
\leftleftarrows	<code>\leftrightsquigarrow</code>	\uparrow	<code>\Uparrow</code>
\leftleftarrows	<code>\leftsquigarrow</code>	\uparrow	<code>\uparrowbarred</code>
\leftleftarrows	<code>\leftthreearrows</code>	\uparrow	<code>\updasharrow^*</code>
\leftleftarrows	<code>\leftwavearrow</code>	\Downarrow	<code>\Updownarrow</code>
\leftleftarrows	<code>\leftwhitearrow^*</code>	\Downarrow	<code>\updownarrow</code>
\leftleftarrows	<code>\linefeed^*</code>	\Downarrow	<code>\updownarrowbar^*</code>
\leftleftarrows	<code>\LLeftarrow</code>	\Downarrow	<code>\updownarrows</code>
\leftleftarrows	<code>\LLeftarrow</code>	\rightarrowtail	<code>\uprightcurvearrow^*</code>
\leftleftarrows	<code>\longleftarrow</code>	\upuparrows	
\leftleftarrows	<code>\Longleftarrow</code>	\uparrow	<code>\upwhitearrow^*</code>
\leftleftarrows	<code>\Longleftrightarrow</code>	\upuparrows	<code>\UUparrow</code>
\leftleftarrows	<code>\longleftrightarrow</code>	\upuparrows	<code>\Uparrow</code>
\leftleftarrows	<code>\longleftsquigarrow</code>	\Downarrow	<code>\varcarriagereturn^*</code>
\leftleftarrows	<code>\Longmapsfrom</code>	\Downarrow	<code>\whitearrowupfrombar^*</code>
\leftleftarrows	<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 `\dbkarow`.

TABLE 161: stix Negated Arrows

‡	\nHdownarrow*	⊣	\nvLeftrightarrow
‡	\nHuparrow*	⇒	\nvRightarrow
↔	\nleftarrow†	⇒	\nvRightarrow
⊬	\nLeftarrow	⇒	\nvrightarrow
⊭	\nleftrightarrow	⇒	\nvRightarrowtail
⊮	\nLeftrightarrow	⇒	\nvrightarrowtail
⊯	\nRightarrow	⇒	\nvtwoheadleftarrow
⊯	\nrightarrow	⇒	\nVtwoheadleftarrow
⊯	\nvleftarrow	⇒	\nvtwoheadleftarrowtail
⊯	\nvLeftarrow	⇒	\nVtwoheadleftarrowtail
⊯	\nVleftarrow	⇒	\nVtwoheadrightarrow
⊯	\nVleftarrowtail	⇒	\nVtwoheadrightarrow
⊯	\nvleftarrowtail	⇒	\nvtwoheadrightarrowtail
⊯	\nvleftrightarrow	⇒	\nVtwoheadrightarrowtail
⊯	\nVleftrightarrow	⇒	\nVtwoheadrightarrowtail

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

† stix defines \ngets as a synonym for \nleftarrow.

TABLE 162: stix Harpoons

⊤	\bardownharpoonleft	⊣	\leftrightharpoons
⊤	\bardownharpoonright	⇒	\leftrightharpoonsdown
⊤	\barleftharpoondown	⊣	\leftrightharpoonsup
⊤	\barleftharpoonup	⇒	\leftrightharpoonupdown
⊤	\barrightharpoondown	⊣	\leftrightharpoonupup
⊤	\barrightharpoonup	⇒	\rightharpoondown
⊤	\barupharpoonleft	⊣	\rightharpoondownbar
⊤	\barupharpoonright	⇒	\rightharpoonsupdown
⊤	\dashleftharpoondown	⊣	\rightharpoonup
⊤	\dashrightharpoondown	⊣	\rightharpoonupbar
↓	\downharpoonleft	⊣	\rightharpoonupdash
↓	\downharpoonleftbar	⊣	\rightleftharpoons
↓	\downharpoonright	⊣	\rightleftharpoonsdown
↓	\downharpoonrightbar	⊣	\rightleftharpoonsup
⇓	\downharpoonsleftright	↓	\updownharpoonleftleft
⇓	\downupharpoonsleftright	↓	\updownharpoonleftright
⊤	\leftharpoondown	↓	\updownharpoonrightleft
⊤	\leftharpoondownbar	↓	\updownharpoonrightright
⊤	\leftharpoonsupdown	⇓	\updownharpoonsleftright
⊤	\leftharpoonup	↓	\upharpoonleft
⊤	\leftharpoonupbar	↓	\upharpoonleftbar
⊤	\leftharpoonupdash	↓	\upharpoonright*

(continued on next page)

(continued from previous page)

\rightsquigarrow \leftrightharpoonondowndown \Downarrow \upharpoonrightbar
 \rightsquigarrow \leftrightharpoonondownup \Updownarrow \upharpoonsleftright

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

TABLE 163: harpoon Extensible Harpoons

\overleftarrow{abc}	\overleftharp{abc}	\overrightarrow{abc}	\overrightharpdown{abc}	\underline{abc}	\underrightharp{abc}
\overleftarrow{abc}	\overleftharpdown{abc}	\underline{abc}	\underleftharp{abc}	\overline{abc}	\underrightharpdown{abc}
\overrightarrow{abc}	\overrightharp{abc}	$\underline{\overleftarrow{abc}}$	\underleftharpdown{abc}		

All of the harpoon symbols are implemented using the `graphics` package (specifically, `graphics`'s `\resizebox` command). Consequently, only TeX backends that support graphical transformations (e.g., *not* Xdvi) can properly display these symbols.

TABLE 164: chemarrow Arrows

\rightarrow \chemarrow

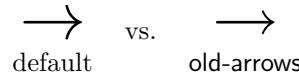
TABLE 165: fge Arrows

\Rightarrow \fgerightarrow \uparrow \fgeuparrow

TABLE 166: old-arrows Arrows

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

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 *AMS*'s `\overleftarrow`, `\overrightarrow`, `\overleftrightarrow`, `\underleftarrow`, `\underrightarrow`, `\underleftrightarrow`, `\xleftarrow`, `\xrightarrow`, `\varinjlim`, and `\varprojlim` symbols (Table 240 on page 112, Table 256 on page 116, and Table 182 on page 96) and `mathtools`'s `\xleftrightarrow`, `\xhookleftarrow`, `\xhookrightarrow`, and `\xmapsto` symbols (Table 257 on page 116).

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 167: old-arrows Harpoons

\leftrightharpoonup	<code>\longleftharpoonup</code>	\rightharpoonup	<code>\longrightharpoonup</code>
-----------------------	---------------------------------	-------------------	----------------------------------

Unlike the symbols shown in Table 166, the `new` package option does not define a `\var...` version of the symbols in this table. Also unlike the symbols shown in Table 166, the harpoon arrowheads in this table are not reduced in size (i.e., relative to the size of those shown in Table 139 on page 75).

TABLE 168: esrelation Restrictions

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

TABLE 169: MnSymbol Spoons

↓	\downfilledspoon	↗	\nnespoon	↖	\nwfilledspoon
↙	\downspoon	↘	\nnwfilledspoon	↗	\nwspoon
←	\leftfilledspoon	↖	\nnwspoon	→	\rightfilledspoon
→	\leftspoon	↗	\nrightfilledspoon	→	\rightspoon*
↑	\ndownfilledspoon	↗	\nrightspoon*	↙	\sefilledspoon
↑	\ndownspoon	↗	\nsefilledspoon	↘	\sespoon
↗	\nefilledspoon	↘	\nsespoon	↗	\swfilledspoon
↗	\nespoon	↗	\nswfilledspoon	↘	\swspoon
↔	\nleftfilledspoon	↗	\nswspoon	↑	\upfilledspoon
↔	\nleftspoon	↑	\nupfilledspoon	↓	\upspoon
↗	\nnefilledspoon	↑	\nupspoon	↓	

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

TABLE 170: MnSymbol Pitchforks

ψ	\downpitchfork	⊗	\nnwpitchfork	▹	\rightpitchfork
←	\leftpitchfork	≠	\nrightpitchfork	⊗	\sepitchfork
¶	\ndownpitchfork	⊗	\nsepitchfork	≠	\swpitchfork
↙	\nepitchfork	⊗	\nswpitchfork	↳	\uppitchfork
↖	\nleftpitchfork	⊟	\nuppitchfork		
⊗	\nnepitchfork	⊗	\nwpitchfork		

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

TABLE 171: MnSymbol Smiles and Frowns

\approx	<code>\doublefrown</code>	$\not\approx$	<code>\nsmileeq</code>	\asymp	<code>\smileeq</code>
\approxeq	<code>\doublefrownneq</code>	$\not\approxeq$	<code>\nsmileeqfrown</code>	\asymp	<code>\smileeqfrown</code>
\asymp	<code>\doublesmile</code>	$\not\asymp$	<code>\nsmilefrown</code>	\asymp	<code>\smilefrown</code>
\asymp	<code>\doublesmileeq</code>	$\not\asymp$	<code>\nsmilefrownneq</code>	\asymp	<code>\smilefrownneq</code>
\approx	<code>\eqfrown</code>	$\not\approx$	<code>\nsqdoublefrown</code>	\approx	<code>\sqdoublefrown</code>
\asymp	<code>\eqsmile</code>	$\not\asymp$	<code>\nsqdoublefrownneq</code>	\asymp	<code>\sqdoublefrownneq</code>
\sim	<code>\frown</code>	$\not\sim$	<code>\nsqdoublesmile</code>	\asymp	<code>\sqdoublesmile</code>
\doteq	<code>\frownneq</code>	$\not\doteq$	<code>\nsqdoublesmileeq</code>	\asymp	<code>\sqdoublesmileeq</code>
\doteq	<code>\frowneqsmile</code>	$\not\doteq$	<code>\nsqeqlfrown</code>	\asymp	<code>\squeqlfrown</code>
\circ	<code>\frownsmile</code>	$\not\circ$	<code>\nsqeqlsmile</code>	\circ	<code>\squeqlsmile</code>
\circ	<code>\frownsmileeq</code>	$\not\circ$	<code>\nsqfrown</code>	\wedge	<code>\sqfrown</code>
$\not\approx$	<code>\ndoublefrown</code>	$\not\approx$	<code>\nsqfrownneq</code>	\triangleleft	<code>\sqfrownneq</code>
$\not\approx$	<code>\ndoublefrownneq</code>	$\not\approx$	<code>\nsqfrownneqsmile</code>	\triangleleft	<code>\sqfrownneqsmile</code>
$\not\approx$	<code>\ndoublesmile</code>	$\not\approx$	<code>\nsqfrownsmile</code>	\triangleleft	<code>\sqfrownsmile</code>
$\not\approx$	<code>\ndoublesmileeq</code>	$\not\approx$	<code>\nsqsmile</code>	\vee	<code>\sqsmile</code>
$\not\approx$	<code>\neqfrown</code>	$\not\approx$	<code>\nsqsmileeq</code>	\asymp	<code>\sqsmileeq</code>
$\not\approx$	<code>\neqsmile</code>	$\not\approx$	<code>\nsqsmileeqfrown</code>	\asymp	<code>\sqsmileeqfrown</code>
$\not\approx$	<code>\nfrown</code>	$\not\approx$	<code>\nsqsmilefrown</code>	\asymp	<code>\sqsmilefrown</code>
$\not\approx$	<code>\nfrownneq</code>	$\not\approx$	<code>\nsqtriplefrown</code>	\asymp	<code>\sqtriplefrown</code>
$\not\approx$	<code>\nfrowneqsmile</code>	$\not\approx$	<code>\nsqtriplesmile</code>	\asymp	<code>\sqtriplesmile</code>
$\not\approx$	<code>\nfrownsmile</code>	$\not\approx$	<code>\ntriplefrown</code>	\asymp	<code>\triplefrown</code>
$\not\approx$	<code>\nfrownsmileeq</code>	$\not\approx$	<code>\ntriplesmile</code>	\asymp	<code>\triplesmile</code>
$\not\approx$	<code>\nsmile</code>	$\not\approx$	<code>\smile</code>	\vee	

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

TABLE 172: fdsymbol Spoons

$\bullet\circ$	<code>\blackwhite spoon</code>	$\not\bullet$	<code>\ndownblackspoon</code>	$\not\bullet$	<code>\nupblackspoon</code>
\bullet	<code>\downblackspoon</code>	$\not\bullet$	<code>\downspoon</code>	$\not\bullet$	<code>\nupspoon</code>
$\circ\bullet$	<code>\downspoon</code>	$\not\circ\bullet$	<code>\leftblackspoon</code>	$\not\circ\bullet$	<code>\whiteblackspoon</code>
$\bullet-$	<code>\leftblackspoon</code>	$\not\bullet-$	<code>\leftrightblackspoon</code>	$\bullet-$	<code>\rightblackspoon</code>
$\bullet-$	<code>\leftrightblackspoon</code>	$\not\bullet-$	<code>\leftrightspoon</code>	$\bullet-$	<code>\rightspoon</code>
$\circ\bullet$	<code>\leftrightspoon</code>	$\not\circ\bullet$	<code>\leftspoon</code>	$\not\circ\bullet$	<code>\upblackspoon</code>
$\circ-$	<code>\leftspoon</code>	$\not\circ-$	<code>\rightblackspoon</code>	$\circ-$	<code>\upspoon</code>
$\bullet\circ$	<code>\nblackwhite spoon</code>	$\not\bullet\circ$	<code>\rightspoon</code>	$\bullet\circ$	<code>\whiteblackspoon</code>

fdsymbol defines synonyms for many of the preceding symbols:

$\circ\bullet$	<code>\cirmid</code>	$\circ-$	<code>\multimapinv</code>	$\not\circ$	<code>\nmultimap</code>
$\circ\circ$	<code>\dualmap</code>	$\not\circ$	<code>\ncirmid</code>	$\not\circ$	<code>\nmultimapinv</code>
$\bullet\circ$	<code>\imageof</code>	$\not\bullet\circ$	<code>\ndualmap</code>	$\not\bullet\circ$	<code>\norigof</code>
$\circ\bullet$	<code>\midcir</code>	$\not\circ\bullet$	<code>\nimageof</code>	$\circ\bullet$	<code>\origof</code>
$\circ-$	<code>\multimap</code>	$\not\circ-$	<code>\nmidcir</code>		

TABLE 173: *fdsymbol* Pitchforks

Ψ	<code>\downnpitchfork</code>	$\not\Psi$	<code>\nleftpitchfork</code>	\exists	<code>\rightpitchfork</code>
\Leftarrow	<code>\leftpitchfork</code>	$\not\Leftarrow$	<code>\nrightpitchfork</code>	$\not\Leftarrow$	<code>\upppitchfork</code>
$\not\Leftarrow$	<code>\ndownnpitchfork</code>	$\not\Leftarrow$	<code>\nupppitchfork</code>		

fdsymbol defines `\npitchfork` as a synonym for `\nupppitchfork` and `\pitchfork` as a synonym for `\upppitchfork`.

TABLE 174: *fdsymbol* Smiles and Frowns

\sim	<code>\frown</code>	$\not\sim$	<code>\nfrownneq</code>	$\not\sim$	<code>\nsmilefrown</code>
\cong	<code>\frownneq</code>	$\not\cong$	<code>\nfrownsmile</code>	\sim	<code>\smile</code>
\simeq	<code>\frownsmile</code>	$\not\simeq$	<code>\nsmile</code>	\cong	<code>\smileeq</code>
$\not\cong$	<code>\nfrown</code>	$\not\cong$	<code>\nsmileeq</code>	$\not\cong$	<code>\smilefrown</code>

fdsymbol defines `\arceq` as a synonym for `\frownneq`, `\asymp` as a synonym for `\smilefrown`, `\closure` as a synonym for `\frownsmile`, `\narceq` as a synonym for `\nfrownneq`, `\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 175: *ulsy* Contradiction Symbols

$\not\not$	<code>\blitza</code>	$\not\not$	<code>\blitzb</code>	$\not\not$	<code>\blitzc</code>	$\not\not$	<code>\blitzd</code>	$\not\not$	<code>\blitze</code>
------------	----------------------	------------	----------------------	------------	----------------------	------------	----------------------	------------	----------------------

TABLE 176: Extension Characters

$-$	<code>\relbar</code>	$=$	<code>\Relbar</code>
-----	----------------------	-----	----------------------

TABLE 177: *stmaryrd* Extension Characters

$/$	<code>\Arrownnot</code>	$ $	<code>\Mapsfromchar</code>	$:$	<code>\Mapstochar</code>
$/$	<code>\arrownot</code>	$ $	<code>\mapsfromchar</code>		

TABLE 178: *txfonts/pxfonts* Extension Characters

$:$	<code>\Mappedfromchar</code>	$\#$	<code>\Mmappedfromchar</code>	$\#$	<code>\Mmapstochar</code>
$:$	<code>\mappedfromchar</code>	$\#$	<code>\mmappedfromchar</code>	$\#$	<code>\mmapstochar</code>

TABLE 179: *mathabx* Extension Characters

$:$	<code>\mapsfromchar</code>	$:$	<code>\mapstochar</code>
$:$	<code>\Mapsfromchar</code>	$:$	<code>\Mapstochar</code>

TABLE 180: stix Extension Characters

\lhook	-	\relbar	\equiv	\RRelbar
\mapsfromchar	=	\Relbar	\equiv	\Rrelbar
\mapstochar	\rightarrow	\rhook		

TABLE 181: 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.³ Each log-like symbol merely produces the eponymous textual equivalent, but with proper surrounding spacing. See Section 10.4 for more information about log-like symbols. As \bmod and \pmod are arguably not symbols we refer the reader to the Short Math Guide for L^AT_EX [Dow00] for samples.

TABLE 182: *AM*S Log-like Symbols

inj lim	\injlim	\varinjlim	\varlimsup
proj lim	\projlim	\varprojlim	\varliminf

Load the **amsmath** package to get these symbols. See Section 10.4 for some additional comments regarding log-like symbols. As \mod and \pod are arguably not symbols we refer the reader to the Short Math Guide for L^AT_EX [Dow00] for samples.

TABLE 183: Q_FM2e Number Sets

C	\Complex	Z	\Integer	N	\Natural	Q	\Rational	R	\Real
C	\COMPLEX	Z	\INTEGER	N	\NATURAL	Q	\RATIONAL	R	\REAL

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

TABLE 184: Greek Letters

α	<code>\alpha</code>	θ	<code>\theta</code>	\circ	<code>\circ</code>	τ	<code>\tau</code>
β	<code>\beta</code>	ϑ	<code>\vartheta</code>	π	<code>\pi</code>	υ	<code>\upsilon</code>
γ	<code>\gamma</code>	ι	<code>\iota</code>	ϖ	<code>\varpi</code>	ϕ	<code>\phi</code>
δ	<code>\delta</code>	κ	<code>\kappa</code>	ρ	<code>\rho</code>	φ	<code>\varphi</code>
ϵ	<code>\epsilon</code>	λ	<code>\lambda</code>	ϱ	<code>\varrho</code>	χ	<code>\chi</code>
ε	<code>\varepsilon</code>	μ	<code>\mu</code>	σ	<code>\sigma</code>	ψ	<code>\psi</code>
ζ	<code>\zeta</code>	ν	<code>\nu</code>	ς	<code>\varsigma</code>	ω	<code>\omega</code>
η	<code>\eta</code>	ξ	<code>\xi</code>				
Γ	<code>\Gamma</code>	Λ	<code>\Lambda</code>	Σ	<code>\Sigma</code>	Ψ	<code>\Psi</code>
Δ	<code>\Delta</code>	Ξ	<code>\Xi</code>	Υ	<code>\Upsilon</code>	Ω	<code>\Omega</code>
Θ	<code>\Theta</code>	Π	<code>\Pi</code>	Φ	<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 “μ”. To make available commands for *all* of the Greek majuscules, either use the `mathspec` package, which requires X_ET_EX, 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 10.5 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 `polutonikogreek`) option—and, of course, a font that provides the glyphs for the Greek alphabet.

TABLE 185: *AMS* Greek Letters

F `\digamma` \varkappa `\varkappa`

TABLE 186: `txfonts/pxfonts` Upright Greek Letters

α	<code>\alphaup</code>	θ	<code>\thetaau</code>	π	<code>\piup</code>	ϕ	<code>\phiiu</code>
β	<code>\betaau</code>	ϑ	<code>\varthetaau</code>	ϖ	<code>\varpiup</code>	φ	<code>\varphiiu</code>
γ	<code>\gammaau</code>	ι	<code>\iotaau</code>	ρ	<code>\rhoau</code>	χ	<code>\chiiu</code>
δ	<code>\deltaau</code>	κ	<code>\kappaau</code>	ϱ	<code>\varrhoau</code>	ψ	<code>\psiiu</code>
ϵ	<code>\epsilonup</code>	λ	<code>\lambdaau</code>	σ	<code>\sigmaau</code>	ω	<code>\omegaau</code>
ε	<code>\varepsilonup</code>	μ	<code>\muau</code>	ς	<code>\varsigmaau</code>		
ζ	<code>\zetaau</code>	ν	<code>\nuau</code>	τ	<code>\tauau</code>		
η	<code>\etaau</code>	ξ	<code>\xiau</code>	υ	<code>\upsilonau</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 `poltonikogreek`) option—and, of course, a font that provides the glyphs for the Greek alphabet.

TABLE 187: `upgreek` Upright Greek Letters

α	<code>\upalpha</code>	θ	<code>\uptheta</code>	π	<code>\uppi</code>	ϕ	<code>\upphi</code>
β	<code>\upbeta</code>	ϑ	<code>\upvartheta</code>	ϖ	<code>\upvarpi</code>	φ	<code>\upvarphi</code>
γ	<code>\upgamma</code>	ι	<code>\upiota</code>	ρ	<code>\uprho</code>	χ	<code>\upchi</code>
δ	<code>\updelta</code>	κ	<code>\upkappa</code>	ϱ	<code>\upvarrho</code>	ψ	<code>\uppsi</code>
ϵ	<code>\upepsilon</code>	λ	<code>\uplambda</code>	σ	<code>\upsigma</code>	ω	<code>\upomega</code>
ε	<code>\upvarepsilon</code>	μ	<code>\upmu</code>	ς	<code>\upvarsigma</code>		
ζ	<code>\upzeta</code>	ν	<code>\upnu</code>	τ	<code>\uptau</code>		
η	<code>\upeta</code>	ξ	<code>\upxi</code>	υ	<code>\upupsilon</code>		
Γ	<code>\Upsilon</code>	Λ	<code>\Upsilon</code>	Σ	<code>\Upsilon</code>	Ψ	<code>\Upsilon</code>
Δ	<code>\Updelta</code>	Ξ	<code>\Upxi</code>	Υ	<code>\Upupsilon</code>	Ω	<code>\Upomega</code>
Θ	<code>\Upsilon</code>	Π	<code>\Upsilon</code>	Φ	<code>\Upsilon</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 16), `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 `poltonikogreek`) option—and, of course, a font that provides the glyphs for the Greek alphabet.

TABLE 188: `fourier` Variant Greek Letters

π	<code>\pi</code>	ρ	<code>\rho</code>
ϖ	<code>\varpi</code>	ϱ	<code>\varrho</code>
\varvarpi	<code>\varvarpi</code>	\varvarrho	<code>\varvarrho</code>

TABLE 189: `txfonts/pxfonts` Variant Latin Letters

<i>g</i>	<code>\varg</code>	<i>v</i>	<code>\varv</code>	<i>w</i>	<code>\varw</code>	<i>y</i>	<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 190: `boisik` Variant Greek Letters

β	<code>\varbeta</code>	κ	<code>\varkappa</code>	ϖ	<code>\varpi</code>	ς	<code>\varsigma</code>
ϵ	<code>\varepsilon</code>	φ	<code>\varphi</code>	ϱ	<code>\varrho</code>	ϑ	<code>\vartheta</code>

TABLE 191: `boisik` Variant Latin Letters

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

TABLE 192: `stix` Variant Greek Letters

ϵ	<code>\varepsilon</code>	φ	<code>\varphi</code>	ϱ	<code>\varrho</code>	ϑ	<code>\vartheta</code>
κ	<code>\varkappa</code>	ϖ	<code>\varpi</code>	ς	<code>\varsigma</code>		

TABLE 193: `stix` Transformed Greek Letters

ϑ	<code>\backepsilon</code>	ι	<code>\turniota</code>
σ	<code>\mho</code>	ϑ	<code>\upbackepsilon</code>

TABLE 194: *AMS* Hebrew Letters

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

`\aleph` (\aleph) appears in Table 294 on page 124.

TABLE 195: `MnSymbol` Hebrew Letters

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

TABLE 196: `fdsymbol` Hebrew Letters

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

TABLE 197: *boisik* Hebrew Letters

```
\beth \gimel \daleth
```

TABLE 198: *stix* Hebrew Letters

```
\aleph \beth \gimel \daleth
```

TABLE 199: Letter-like Symbols

\perp	<code>\bot</code>	\forall	<code>\forall</code>	ι	<code>\imath</code>	\ni	<code>\ni</code>	\top	<code>\top</code>
ℓ	<code>\ell</code>	\hbar	<code>\hbar</code>	\in	<code>\in</code>	∂	<code>\partial</code>	\wp	<code>\wp</code>
\exists	<code>\exists</code>	\Im	<code>\Im</code>	\jmath	<code>\jmath</code>	\Re	<code>\Re</code>		

TABLE 200: *AMS* Letter-like Symbols

\mathbb{k}	<code>\Bbbk</code>	\complement	<code>\complement</code>	\hbar	<code>\hbar</code>
\mathbb{R}	<code>\circledR</code>	\Finv	<code>\Finv</code>	\hslash	<code>\hslash</code>
\mathbb{S}	<code>\circledS</code>	\Game	<code>\Game</code>	\nexists	<code>\nexists</code>

TABLE 201: *txfonts/pxfonts* Letter-like Symbols

```
\mathcent \mathsterling* \notin \notni
```

* It's generally preferable to use the corresponding symbol from Table 3 on page 15 because the symbols in that table work properly in both text mode and math mode.

TABLE 202: *mathabx* Letter-like Symbols

$\bar{\epsilon}$	<code>\barin</code>	\in	<code>\in</code>	$\not\top$	<code>\nottop</code>	\notin	<code>\notin</code>
\complement	<code>\complement</code>	$\not\exists$	<code>\notexists</code>	\owns	<code>\owns</code>	$\not\owns$	<code>\notowns</code>
\exists	<code>\exists</code>	$\not\perp$	<code>\notbot</code>	$\not\equiv$	<code>\notequiv</code>	$\not\models$	<code>\notmodels</code>
\Finv	<code>\Finv</code>	$\not\in$	<code>\notin</code>	∂	<code>\partial</code>	$\not\partial$	<code>\notpartial</code>
\Game	<code>\Game</code>	$\not\top$	<code>\nottop</code>	$\not\partial$	<code>\notpartial</code>	$\not\partial$	<code>\notpartial</code>

TABLE 203: *MnSymbol* Letter-like Symbols

\perp	<code>\bot</code>	\in	<code>\in</code>	$\not\in$	<code>\notin</code>	\top	<code>\top</code>
\exists	<code>\exists</code>	$\not\exists$	<code>\notexists</code>	\owns	<code>\owns</code>	$\not\owns$	<code>\notowns</code>
\forall	<code>\forall</code>	$\not\in$	<code>\nin*</code>	∂	<code>\partial</code>	$\not\partial$	<code>\notpartial</code>

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

TABLE 204: `fdsymbol` Letter-like Symbols

\perp	<code>\bot</code>	\forall	<code>\forallall</code>	\in	<code>\in</code>	\ni	<code>\owns</code>
\complement	<code>\complement</code>	\setminus	<code>\Game</code>	\nexists	<code>\nexists</code>	\top	<code>\top</code>
\exists	<code>\exists</code>	\hbar	<code>\hbar</code>	\notin	<code>\nin</code>	\wp	<code>\wp</code>
\exists	<code>\Finv</code>	\hbar	<code>\hbar</code>	\nexists	<code>\nexists</code>	\wp	<code>\wp</code>

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

TABLE 205: `boisik` Letter-like Symbols

k	<code>\Bbbk</code>	\setminus	<code>\Game</code>	i	<code>\imath</code>	\nexists	<code>\nexists</code>
\complement	<code>\complement</code>	\hbar	<code>\hbar</code>	T	<code>\intercal</code>	\wp	<code>\wp</code>
\exists	<code>\Finv</code>	\hbar	<code>\hbar</code>	j	<code>\jmath</code>	\wp	<code>\wp</code>

TABLE 206: `stix` Letter-like Symbols

\AA	<code>\Angstrom</code>	\mathcal{E}	<code>\Eulerconst</code>	i	<code>\imath</code>	T	<code>\top</code>
\mathbb{k}	<code>\Bbbk</code>	\exists	<code>\exists</code>	\intercal	<code>\intercal</code>	\topbot	<code>\topbot</code>
\perp	<code>\bot</code>	\exists	<code>\Finv</code>	\mathcal{J}	<code>\jmath</code>	\wp	<code>\wp</code>
\circledR	<code>\circledR</code>	\forall	<code>\forallall</code>	\mathcal{S}	<code>\mathord{\mathit{\mathfrak{S}}}</code>	$\mathord{\mathit{\mathfrak{Y}}}$	<code>\mathord{\mathit{\mathfrak{Y}}}</code>
\circledS	<code>\circledS</code>	\setminus	<code>\Game</code>	\mathcal{P}	<code>\mathord{\mathit{\mathfrak{P}}}</code>	$\mathord{\mathit{\mathfrak{Z}}}$	<code>\mathord{\mathit{\mathfrak{Z}}}</code>
\complement	<code>\complement</code>	\hbar	<code>\hbar</code>	\mathcal{L}	<code>\mathord{\mathit{\mathfrak{L}}}</code>	$\mathord{\mathit{\mathfrak{Zbar}}}$	<code>\mathord{\mathit{\mathfrak{Zbar}}}</code>
\digamma	<code>\digamma</code>	\hbar	<code>\hbar</code>	\mathcal{N}	<code>\mathord{\mathit{\mathfrak{N}}}</code>	$\mathord{\mathit{\mathfrak{Yup}}}$	<code>\mathord{\mathit{\mathfrak{Yup}}}</code>
ℓ	<code>\ell</code>	\mathcal{I}	<code>\Im</code>	\mathcal{R}	<code>\Re</code>	$\mathord{\mathit{\mathfrak{Topbot}}}$	<code>\mathord{\mathit{\mathfrak{Topbot}}}</code>

TABLE 207: `trfsigns` Letter-like Symbols

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

TABLE 208: `mathdesign` Letter-like Symbols

\in	<code>\in</code>	\ni	<code>\owns</code>
\notin	<code>\notin</code>	\ni	<code>\smallin</code>
$\not\in$	<code>\not\in</code>	\ni	<code>\smallowns</code>
$\not\ni$	<code>\not\ni</code>	\ni	<code>\smallowns</code>

The `mathdesign` package additionally provides versions of each of the letter-like symbols shown in Table 200 on the previous page.

TABLE 209: fge Letter-like Symbols

V	\fgeA	g	\fgeeszett	B	\fgeleftB	F	\fgeU
ß	\fgec	ß	\fgeF	Ó	\fgeleftC		
þ	\fged	þ	\fgef	Þ	\fgerightB		
ð	\fgee	ð	\fgelb*	f	\fges		

* The fge package defines \fgeeta, \fgeN, and \fgeoverU as synonyms for \fgelb.

TABLE 210: fourier Letter-like Symbols

∂ \partial ∂ \varpartialdiff

TABLE 211: cmlL Letter-like Symbols

⊤ \Bot ⊥ \simbot

TABLE 212: *AMS* Delimiters

⌈	\ulcorner	⌉	\urcorner
⌊	\llcorner	⌋	\lrcorner

TABLE 213: stmaryrd Delimiters

{ \Lbag	}	\Rbag	{ \lbag	}	\rbag
⌈ \lceil	⌉	\rceil	⌊ \lfloor	⌋	\rfloor
(\lparenthesis)	\rparenthesis			

TABLE 214: mathabx Delimiters

[\lcorners]	\rcorners
⌈ \ulcorner	⌉	\urcorner
⌊ \llcorner	⌋	\lrcorner

TABLE 215: boisik Delimiters

⌈ \ulcorner	⌉	\urcorner
⌊ \llcorner	⌋	\lrcorner

TABLE 216: stix Delimiters

{	\langledot	}	\rangledot	{	\llangle	}	\rrangle
{	\lbag	}	\rbag	[\llcorner]	\lrcorner
(\lblkbrbrak)	\rbblkbrbrak	(\llparenthesis)	\rrparenthesis
[\lbracklltick]	\rbracklrtick	\&	\Lparengtr	\&	\Rparenless
[\lbrackubar]	\rbrackubar	\&	\lparenless	\>	\rparengtr
[\lbrackkultick]	\rbracklrtick	\&	\lvzigzag	\&	\rvzigzag
{	\Lbrbrak	}	\Rbrbrak	\&	\Lvzigzag	\&	\Rvzigzag
<	\lcurvyangle	>	\rcurvyangle	\&	\ulcorner	\&	\urcorner

TABLE 217: nath Delimiters

_ \niv _ \vin

TABLE 218: Variable-sized Delimiters

\downarrow	\downarrow	\downarrow	\Downarrow	[[]]
\langle	\rangle	\rangle	\rangle			\parallel	\parallel
\leftceil	\rightceil	\rightceil	\rightceil	\uparrow	\uparrow	\Uparrow	\Uparrow
\leftlfloor	\rightlfloor	\rightlfloor	\rightlfloor	\updownarrow	\updownarrow	\Updownarrow	\Updownarrow
(())	\{	\{	\}	\}
/	/	/	\backslash	\backslash	\backslash	\backslash	\backslash

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 `\parallel`.

ε -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: “ $\langle\phi|\psi\rangle$ ”). A similar effect can be achieved in conventional L^AT_EX using the `braket` package.

TABLE 219: Large, Variable-sized Delimiters

\int	$\left\{ \right\}$	$\left(\right)$	$\left[\right]$
$ $	$\left \right $	$\left \right $	$\left \right $

$\backslash lmoustache$	$\backslash rmoustache$	$\backslash lgroup$	$\backslash rgroup$
$\backslash arrowvert$	$\backslash Arrowvert$	$\backslash bracevert$	

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

TABLE 220: *AMS* Variable-sized Delimiters

$ $	$\left \right $	$\backslash lvert$	$\left \right $	$\backslash rvert$
\parallel	$\left\ \right\ $	$\backslash lVert$	$\left\ \right\ $	$\backslash rVert$

According to the `amsmath` documentation [AMS99], the preceding symbols are intended to be used as delimiters (e.g., as in “ $| -z |$ ”) while the $\backslash vert$ and $\backslash Vert$ symbols (Table 218 on the previous page) are intended to be used as operators (e.g., as in “ $p|q$ ”).

TABLE 221: `stmaryrd` Variable-sized Delimiters

\llbracket	\rrbracket	$\backslash llbracket$	$\backslash rrbracket$
--------------	--------------	------------------------	------------------------

TABLE 222: `mathabx` Variable-sized Delimiters

\llbracket	\rrbracket	$\backslash ldbrack$	$\backslash rdbrack$
$\{\}$	$\}$	$\backslash lfilet$	$\backslash rfilet$
$ $	\parallel	$\backslash thickvert$	$\backslash vvvert$

TABLE 223: MnSymbol Variable-sized Delimiters

\parallel	\parallel	$\backslash\text{Arrowvert}$	{	$\left\{ \backslash\text{lbrace}$	$\right]$	$\right\} \backslash\text{rceil}$
		$\backslash\text{arrowvert}$	[$\left[\backslash\text{lceil}$	$\right]$	$\right\} \backslash\text{rfloor}$
\	\	$\backslash\text{backslash}$	[$\left[\backslash\text{lfloor}$)	$\right) \backslash\text{rgroup}$
		$\backslash\text{bracevert}$	($\left(\backslash\text{lgroup}$)	$\right) \backslash\text{rmoustache}$
[[$\langle \langle$	$\backslash\text{llangle}$	$\rangle \rangle$	$\backslash\text{rrangle}$
]]		$\rangle \rangle$	$\backslash\text{llcorner}$	$\rangle \rangle$	$\backslash\text{rsem}$
(($\langle \langle$	$\backslash\text{lmoustache}$	$\rangle \rangle$	$\backslash\text{rWavy}$
))		$\rangle \rangle$	$\backslash\text{lrcorner}$	$\rangle \rangle$	$\backslash\text{rwavey}$
/	/		\llbracket	$\backslash\text{lsem}$	\rrbracket	$\backslash\text{ulcorner}$
{	{	<	$\langle \langle$	$\backslash\text{lwavy}$	$\rangle \rangle$	$\backslash\text{ullcorner}$
}	}	>	$\rangle \rangle$	$\backslash\text{lWavy}$	$\rangle \rangle$	$\backslash\text{ulrcorner}$
			$\rangle \rangle$	$\backslash\text{rangle}$	$\rangle \rangle$	$\backslash\text{urcorner}$
{	{	$\backslash\text{rangle}$	$\rangle \rangle$	$\backslash\text{ranglebar}$	\parallel	$\parallel \backslash\mid$
{	{	$\backslash\text{ranglebar}$	$\rangle \rangle$	$\backslash\text{rbrace}$		

\vert is a synonym for \mid . \Vert is a synonym for $\backslash\mid$. \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 224: *fdsymbol* Variable-sized Delimiters

\		\backslash	.		\lrcorner)		\rparen
\downarrow		\downarrow			\lvert			\rvert
\Downarrow		\Downarrow			\lVert			\rVert
\langle		\lAngle			\lVvert			\rVvert
\langle		\langle	/		\mathslash	\rangle		\ulcorner
\langle		\langledot	\rangle		\rangle	\rangle		\ulcorner
\{		\lbrace	\rangle		\rAngle	\rangle		\ulrcorner
\[\lbrack	\rangle		\rangledot	\uparrow		\uparrow
\[\![\lBrack	\}		\rbrace	\uparrow		\Uparrow
\[\![\lceil	\]\!		\rBrack	\updownarrow		\updownarrow
\[\![\lfloor	\]		\rbrack	\updownarrow		\Updownarrow
\[\[\lgroup	\]		\rceil	\uparrow		\urcorner
\[\[\llcorner	\]		\rfloor			\vert
\[\[\lmoustache	\]		\rgroup			\Vert

(continued on next page)

(continued from previous page)

((\lparen)	\rmoustache			\Vvert
---	---	---------	---	-------------	--	--	--------

`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 225: stix Variable-sized Delimiters

“		<code>\Arrowvert</code>	«	<<	<code>\lAngle</code>	】	】	<code>\rceil</code>
·		<code>\arrowvert</code>	{	{	<code>\lbrace</code>	】	】	<code>\rfloor</code>
\	\\	<code>\backslash</code>	{	{	<code>\lBrace</code>)	}	<code>\rgroup</code>
⇓		<code>\Ddownarrow</code>	[[<code>\lBrack</code>	\]	<code>\rmoustache</code>
⇓		<code>\DDownarrow</code>	((<code>\lbrbrak</code>))	<code>\rParen</code>
↓		<code>\downarrow</code>	[[<code>\lceil</code>	↑	↑	<code>\uparrow</code>
↓		<code>\Downarrow</code>	[[<code>\lfloor</code>	↑	↑	<code>\Uparrow</code>
[[[((<code>\lgroup</code>	\	\	<code>\Updownarrow</code>
]]]))	<code>\rmoustache</code>	\	\	<code>\updownarrow</code>

(continued from previous page)

(())	(\lParen	$\uparrow\uparrow$	\Uparrow
)))))	\rAngle	$\uparrow\uparrow$	\UUpArrow
/	/	/))	\rangle	$\parallel\parallel$	\Vert
<	<	<	}	}	\rbrace		\vert
>	>	>))	\rBrace	$\parallel\parallel$	\Vvert
))	\rBrack		
{	{	{))	\rangle		
					\langle		\rbrbrak

TABLE 226: `mathdesign` Variable-sized Delimiters

,		\leftwave	,		\rightwave
,		\leftevaw	,		\rightevaw

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 227: `nath` Variable-sized Delimiters (Double)

$\langle \langle \backslash lAngle \rangle \rangle$	$\backslash rAngle$
$\llbracket \llbracket \backslash lBrack \rrbracket \rrbracket$	$\backslash rBrack$
$\lceil \lceil \backslash lCeil \rceil \rceil$	$\backslash rCeil$
$\lfloor \lfloor \backslash lFloor \rfloor \rfloor$	$\backslash rFloor$
$\parallel \parallel \backslash lVert^*$	$\parallel \parallel \backslash rVert^*$

* `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 227 can also be expressed using the `\double` macro. See the `nath` documentation for examples and additional information.

TABLE 228: `nath` Variable-sized Delimiters (Triple)

$\langle\langle\langle \backslash triple< \rangle\rangle\rangle$	$\backslash triple>$
$\llbracket \llbracket \llbracket \backslash triple[\rrbracket \rrbracket \rrbracket$	$\backslash triple]$
$\parallel \parallel \parallel \backslash ltriple ^*$	$\parallel \parallel \parallel \backslash rtriple ^*$

* Similar to `\lVert` and `\rVert` in Table 227, `\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 229: `fourier` Variable-sized Delimiters

$\llbracket \llbracket \llbracket \backslash llbracket \rrbracket \rrbracket \rrbracket$	$\backslash rrbracket$
$\parallel \parallel \parallel \backslash VERT$	

TABLE 230: `textcomp` Text-mode Delimiters

\langle	<code>\textlangle</code>	\rangle	<code>\textrangle</code>
\llbracket	<code>\textlbrackdbl</code>	\rrbracket	<code>\textrbrackdbl</code>
$\{$	<code>\textlquill</code>	$\}$	<code>\textrquill</code>

TABLE 231: `metre` Text-mode Delimiters

$\}$	<code>\alad</code>	$\}$	<code>\Alad</code>	\dagger	<code>\crux</code>	\dagger	<code>\Crux</code>
$\{$	<code>\alas</code>	$\{$	<code>\Alas</code>	\rfloor	<code>\quadrad</code>	\rfloor	<code>\Quadrad</code>
\rangle	<code>\angud</code>	\rangle	<code>\Angud</code>	\lceil	<code>\quadras</code>	\lceil	<code>\Quadras</code>
\langle	<code>\angus</code>	\langle	<code>\Angus</code>				

TABLE 232: 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 294 on page 124.) 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 “ $\hat{\hat{i}}$ ”.

- * The `\overline` command (Table 240 on page 112) produces a wider accent than `\bar`: “ \bar{A} ” vs. “ $\bar{\bar{A}}$ ”. 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][2][3]{%
  \mkern#1mu\overline{\mkern-#1mu#2}}
```

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

TABLE 233: `AMS` Math-mode Accents

$$\ddot{a} \quad \text{\textbackslash dddot\{a\}} \quad \ddot{\ddot{a}} \quad \text{\textbackslash dddd\{a\}}$$

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 `AMS` ones tighten the space between the dots (from \ddot{a} to $\ddot{\ddot{a}}$). The `mathabx` and `mathdots` versions also function properly within subscripts and superscripts ($x^{\ddot{a}}$ instead of $x^{\text{\textbackslash dddot\{a\}}}$).

TABLE 234: MnSymbol Math-mode Accents

 $\vec{a} \quad \backslash\text{vec}\{a\}$

TABLE 235: fdsymbol Math-mode Accents

α	$\backslash\text{middlebar}\{a\}$	\not	$\backslash\text{strokethrough}\{a\}$
α	$\backslash\text{middleslash}\{a\}$	\vec{a}	$\backslash\text{vec}\{a\}$

$\backslash\text{middlebar}$ and $\backslash\text{middleslash}$ 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 236: boisik Math-mode Accents

 $\tilde{a} \quad \backslash\text{vec}\{a\}$

TABLE 237: stix Math-mode Accents

\acute{a}	$\backslash\text{acute}\{a\}$	\hat{a}	$\backslash\text{hat}\{a\}$
\overline{a}	$\backslash\text{annuity}\{a\}$	\bar{a}	$\backslash\text{leftarrowaccent}\{a\}$
\ddot{a}	$\backslash\text{asteraccent}\{a\}$	\tilde{a}	$\backslash\text{leftharpoonaccent}\{a\}$
\bar{a}	$\backslash\text{bar}\{a\}$	\ddot{a}	$\backslash\text{leftrightarrowaccent}\{a\}$
\breve{a}	$\backslash\text{breve}\{a\}$	\grave{a}	$\backslash\text{mathring}\{a\}$
\candra{a}	$\backslash\text{candra}\{a\}$	\dot{a}	$\backslash\text{ocommatopright}\{a\}$
\check{a}	$\backslash\text{check}\{a\}$	$\grave{\dot{a}}$	$\backslash\text{oturnedcomma}\{a\}$
$\ddot{\ddot{a}}$	$\backslash\text{dddot}\{a\}$	$\grave{\dot{a}}$	$\backslash\text{ovhook}\{a\}$
$\ddot{\ddot{a}}$	$\backslash\text{ddot}\{a\}$	$\grave{\ddot{a}}$	$\backslash\text{rightharpoonaccent}\{a\}$
\ddot{a}	$\backslash\text{dot}\{a\}$	$\tilde{\dot{a}}$	$\backslash\text{tilde}\{a\}$
\ddot{a}	$\backslash\text{droang}\{a\}$	\widehat{a}	$\backslash\text{widebridgeabove}\{a\}$
\grave{a}	$\backslash\text{grave}\{a\}$		

TABLE 238: fge Math-mode Accents

 $\dot{\grave{a}} \quad \backslash\text{spirituslenis}\{A\}\backslash\text{spirituslenis}\{a\}^*$

* When fge is passed the crescent option, $\backslash\text{spirituslenis}$ instead uses a crescent accent as in “ $\grave{\dot{a}}$ ”.

TABLE 239: *yhmath* Math-mode Accents
 \mathring{a} \ring{a}

This symbol is largely obsolete, as standard L^AT_EX 2 _{ε} has supported \mathring{} (Table 232 on page 110) since June 1998 [LAT98].

TABLE 240: Extensible Accents

\widetilde{abc}	\widetilde{abc}* [*]	\widehat{abc}	\widehat{abc}* [*]
\overleftarrow{abc}	\overleftarrow{abc} [†]	\overrightarrow{abc}	\overrightarrow{abc} [†]
\overline{abc}	\overline{abc}	\underline{abc}	\underline{abc}
\overbrace{abc}	\overbrace{abc}	\underbrace{abc}	\underbrace{abc}
\sqrt{abc}			\sqrt{abc} [‡]

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 246 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 244 on the following page). and even more extensible by the **yhmath** package (Table 242 on the following page).

† 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 “ $3 + \cancel{2}^5$ ”) 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 241: *overrightarrow* Extensible Accents
 \overrightarrow{abc} \overrightarrow{abc}

TABLE 242: *yhmath* Extensible Accents

\widehat{abc}	<code>\widehat{abc}</code>	\widetilde{abc}	<code>\widetilde{abc}</code>
\wideparen{abc}	<code>\wideparen{abc}</code>	\widetriangle{abc}	<code>\widetriangle{abc}</code>
\widering{abc}	<code>\widering{abc}</code>		

TABLE 243: *AMS* Extensible Accents

\overleftrightarrow{abc}	<code>\overleftrightarrow{abc}</code>	$\underleftrightarrow{abc}$	<code>\underleftrightarrow{abc}</code>
\overleftarrow{abc}	<code>\overleftarrow{abc}</code>	\overrightarrow{abc}	<code>\overrightarrow{abc}</code>

TABLE 244: *MnSymbol* Extensible Accents

\overbrace{abc}	<code>\overbrace{abc}</code>	\underbrace{abc}	<code>\underbrace{abc}</code>
\overgroup{abc}	<code>\overgroup{abc}</code>	\undergroup{abc}	<code>\undergroup{abc}</code>
\overleftharpoon{abc}	<code>\overleftharpoon{abc}</code>	\widehat{abc}	<code>\widehat{abc}</code>
\overline{abc}	<code>\overline{abc}</code>	\wideparen{abc}	<code>\wideparen{abc}</code>
\overrightharpoon{abc}	<code>\overrightharpoon{abc}</code>	\widetilde{abc}	<code>\widetilde{abc}</code>
\underbrace{abc}	<code>\underbrace{abc}</code>		

TABLE 245: *fdsymbol* Extensible Accents

\overbrace{abc}	<code>\overbrace{abc}</code>	\underbrace{abc}	<code>\underbrace{abc}</code>
\overgroup{abc}	<code>\overgroup{abc}</code>	\undergroup{abc}	<code>\undergroup{abc}</code>
\overleftharpoon{abc}	<code>\overleftharpoon{abc}</code>	\widehat{abc}	<code>\widehat{abc}</code>
\overline{abc}	<code>\overline{abc}</code>	\wideparen{abc}	<code>\wideparen{abc}</code>
\overrightharpoon{abc}	<code>\overrightharpoon{abc}</code>	\widetilde{abc}	<code>\widetilde{abc}</code>
\underbrace{abc}	<code>\underbrace{abc}</code>		

TABLE 246: stix Extensible Accents

\overbrace{abc}	<code>\longdivision{abc}</code>	\underbrace{abc}	<code>\underbracket{abc}</code>
\overbrace{abc}	<code>\overbrace{abc}</code>	\underbrace{abc}	<code>\underleftarrow{abc}</code>
\overbracket{abc}	<code>\overbracket{abc}</code>	\underbracket{abc}	<code>\underleftharpoon{abc}</code>
\overleftarrow{abc}	<code>\overleftarrow{abc}</code>	\underleftarrow{abc}	<code>\underleftrightarrow{abc}</code>
\overleftarrow{abc}	<code>\overleftharpoon{abc}</code>	\underbrace{abc}	<code>\underparen{abc}</code>
\overrightarrow{abc}	<code>\overleftrightarrow{abc}</code>	\underbrace{abc}	<code>\underrightarrow{abc}</code>
\overbrace{abc}	<code>\overparen{abc}</code>	\underbrace{abc}	<code>\underrightharpoon{abc}</code>
\overrightarrow{abc}	<code>\overrightarrow{abc}</code>	\widecheck{abc}	<code>\widecheck{abc}</code>
\overrightarrow{abc}	<code>\overrightharpoon{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 247: mathtools Extensible Accents

\overbrace{abc}	<code>\overbrace{abc}</code>	\underbrace{abc}	<code>\underbrace{abc}</code>
\overbracket{abc}	<code>\overbracket{abc}</code> *	\underbracket{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 248: mathabx Extensible Accents

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

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

TABLE 249: fourier Extensible Accents

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

TABLE 250: 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 251: abraces Extensible Accents

\overbrace{abc}	<code>\aoverbrace{abc}</code>	\underbrace{abc}	<code>\aunderbrace{abc}</code>
-------------------	-------------------------------	--------------------	--------------------------------

`\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 `abraces` documentation for more information.

TABLE 252: undertilde Extensible Accents

\widetilde{abc}	<code>\utilde{abc}</code>
-------------------	---------------------------

Because `\utilde` is based on `\widetilde` it is also made more extensible by the `yhmath` package (Table 242 on page 113).

TABLE 253: ushort Extensible Accents

abc \ushortdw{abc} abc \ushortw{abc}

`\ushortw` and `\ushortdw` are intended to be used with multi-character arguments (“words”) while `\ushort` and `\ushortd` 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 “`\ushort{x}\ushort{y}\underline{x}\underline{y}`”, which looks like “xyxy”.

TABLE 254: mdwmath Extensible Accents

\sqrt{abc} \sqrt*{abc}

TABLE 255: actuarialangle Extensible Accents

`\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 `\texttt{}``, `\angln` as `\angl\{n\}`, and `\anglrl` as `\angl\{r\}`.

TABLE 256: *AMS* Extensible Arrows

\xleftarrow{abc} \xleftarrow{abc} \xrightarrow{abc} \xrightarrow{abc}

TABLE 257: mathtools Extensible Arrows

\overleftarrow{abc}	<code>\xhookleftarrow{abc}</code>	\overrightleftarrow{abc}	<code>\xleftrightharpoons{abc}</code>
$\overleftarrow{\overrightarrow{abc}}$	<code>\xhookrightarrow{abc}</code>	$\overleftarrow{\overrightarrow{abc}}$	<code>\xmapsto{abc}</code>
$\overleftarrow{\overleftarrow{abc}}$	<code>\xLeftarrow{abc}</code>	$\overrightarrow{\overleftarrow{abc}}$	<code>\xRightarrow{abc}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{abc}}}$	<code>\xleftharpoondown{abc}</code>	$\overleftarrow{\overleftarrow{\overleftarrow{abc}}}$	<code>\xrightharpoondown{abc}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}$	<code>\xleftharpoonup{abc}</code>	$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}$	<code>\xrightharpoonup{abc}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}$	<code>\xleftrightharpoonup{abc}</code>	$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}$	<code>\xrightleftharpoons{abc}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}$	<code>\xleftrightharpoonup{abc}</code>	$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}$	<code>\xrightleftharpoons{abc}</code>

TABLE 258: chemarr Extensible Arrows

\overleftarrow{abc} \xrightleftharpoons{abc}

TABLE 259: chemarrow Extensible Arrows

$\xleftarrow[def]{abc}$	<code>\autoleftarrow{abc}{def}</code>	$\xrightarrow[def]{abc}$	<code>\autorightarrow{abc}{def}</code>
$\xleftrightharpoons[def]{abc}$	<code>\autoleftrightharpoons{abc}{def}</code>	$\xrightleftharpoons[def]{abc}$	<code>\autorightleftharpoons{abc}{def}</code>

In addition to the symbols shown above, `chemarrow` also provides `\larrowfill`, `\rarrowfill`, `\leftrightharpoonsfill`, and `\rightleftharpoonsfill` macros. Each of these takes a length argument and produces an arrow of the specified length.

TABLE 260: extarrows Extensible Arrows

\xLeftrightarrow{abc}	<code>\xLeftrightarrow{abc}</code>	$\xLongleftrightarrow{abc}$	<code>\xLongleftrightarrow{abc}</code>
\xleftrightarrow{abc}	<code>\xleftrightarrow{abc}</code>	$\xlongleftrightarrow{abc}$	<code>\xlongleftrightarrow{abc}</code>
\xlongequal{abc}	<code>\xlongequal{abc}</code>	\xLongrightarrow{abc}	<code>\xLongrightarrow{abc}</code>
\xLongleftarrow{abc}	<code>\xLongleftarrow{abc}</code>	\xlongrightarrow{abc}	<code>\xlongrightarrow{abc}</code>
\xlongleftarrow{abc}	<code>\xlongleftarrow{abc}</code>		

TABLE 261: extpfeil Extensible Arrows

\xlongequal{abc}	<code>\xlongequal{abc}</code>	\xtwoheadleftarrow{abc}	<code>\xtwoheadleftarrow{abc}</code>
\xmapsto{abc}	<code>\xmapsto{abc}</code>	\xtwoheadrightarrow{abc}	<code>\xtwoheadrightarrow{abc}</code>
\xleftrightarrow{abc}	<code>\xleftrightarrow{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 262: DotArrow Extensible Arrows

$$\dashrightarrow \quad \text{\dotarrow{a}}$$

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 263: halloweenmath Extensible Arrows

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

$$\begin{array}{ccc} \overrightarrow{abc} & \text{vs.} & \overrightarrow{abc} \\ \text{\tiny \overrightarrow{abc}} & & \text{\tiny \overscriptrightarrow{abc}} \end{array}$$

TABLE 264: trfsigns Extensible Transform Symbols

$$\begin{array}{cc} \overleftarrow{abc} & \text{\tiny \dft{abc}} & \overleftarrow{abc} & \text{\tiny \DFT{abc}} \end{array}$$

TABLE 265: esrelation Extensible Relations

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

TABLE 266: halloweenmath Extensible Witches

$\overleftarrow{\overleftarrow{abc}}$	<code>\overleftarrow{\overleftarrow{abc}}</code>	$\overrightarrow{\overrightarrow{abc}}$	<code>\overrightarrow{\overrightarrow{abc}}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{abc}}}$	<code>\overleftarrow{\overleftarrow{\overleftarrow{abc}}}</code>	$\overrightarrow{\overrightarrow{\overrightarrow{abc}}}$	<code>\overrightarrow{\overrightarrow{\overrightarrow{abc}}}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}$	<code>\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}</code>	$\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}$	<code>\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}$	<code>\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}</code>	$\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}$	<code>\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}$	<code>\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}</code>	$\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}}$	<code>\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}}</code>

TABLE 267: halloweenmath Extensible Ghosts

$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}$	<code>\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}</code>	$\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}}$	<code>\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}}$	<code>\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}}</code>	$\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}}}$	<code>\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}}}</code>
$\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}}}$	<code>\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{\overleftarrow{abc}}}}}}}}</code>	$\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}}}}$	<code>\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{\overrightarrow{abc}}}}}}}}</code>

TABLE 268: `holtpolt` Non-commutative Division Symbols

$\begin{array}{c} abc \\ \hline def \end{array}$	<code>\holter{abc}{def}</code>	$\begin{array}{c} abc \\ \hline def \end{array}$	<code>\polter{abc}{def}</code>
--------------------------------------------------	--------------------------------	--------------------------------------------------	--------------------------------

TABLE 269: Dots

\cdot	<code>\cdotp</code>	$:$	<code>\colon^*</code>	$.$	<code>\ldotp</code>	$:$	<code>\vdots</code>
\dots	<code>\cdots</code>	\ddots	<code>\ddots</code>	\dots	<code>\ldots</code>		

* While “ $:$ ” is valid in math mode, `\colon` uses different surrounding spacing. See Section 10.4 and the Short Math Guide for L^AT_EX [Dow00] for more information on math-mode spacing.

\dagger The `mathdots` package redefines `\ddots` and `\vdots` (Table 275) 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^AT_EX 2 _{ε} ’s `\ddots` and `\vdots` macros.

TABLE 270: *AMS* Dots

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

* `\because` and `\therefore` are defined as binary relations and therefore also appear in Table 89 on page 52.

The *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 271: *wasysym* Dots

\therefore `\wasytherefore`

TABLE 272: MnSymbol Dots

\cdot	$\cdot\cdot$	\cdots	$\cdotp\cdotp\cdotp$	$\cdotp\cdotp$	$\cdotp\cdotp\cdotp$	$\cdotp\cdotp\cdotp$
\therefore	$\ddot{\cdot}\ddot{\cdot}$	$\cdots\cdots$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$
\therefore	\ddots	$\cdots\cdots$	$\leftarrow\leftarrow\leftarrow$	$\leftarrow\leftarrow\leftarrow$	$\leftarrow\leftarrow\leftarrow$	$\leftarrow\leftarrow\leftarrow$
\therefore	$\diamond\diamond\diamond$	$\cdots\cdots$	$\rightarrow\rightarrow\rightarrow$	$\rightarrow\rightarrow\rightarrow$	$\rightarrow\rightarrow\rightarrow$	$\rightarrow\rightarrow\rightarrow$
\therefore	$\downarrow\downarrow\downarrow$	$\cdots\cdots$	$\square\square\square$	$\square\square\square$	$\square\square\square$	$\square\square\square$
\therefore	$\circ\circ\circ$	$\cdots\cdots$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$

MnSymbol defines \therefore as \uptherefore and \because as \downtherefore . Furthermore, $\cdot\cdot\cdot$ and \colon produce the same glyphs as \cdots and \vdots respectively but serve as TeX math punctuation (class 6 symbols) instead of TeX binary operators (class 2).

All of the above except $\cdot\cdot\cdot$ and \vdots are defined as binary operators and therefore also appear in Table 56 on page 33.

TABLE 273: fdsymbol Dots

\cdot	$\cdot\cdot$	\cdots	$\cdot\cdot\cdot$	$\cdotp\cdotp\cdotp$	$\cdotp\cdotp\cdotp$	$\cdotp\cdotp\cdotp$
\therefore	$\ddot{\cdot}\ddot{\cdot}$	$\cdots\cdots$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$
\therefore	\ddots	$\cdots\cdots$	$\leftarrow\leftarrow\leftarrow$	$\leftarrow\leftarrow\leftarrow$	$\leftarrow\leftarrow\leftarrow$	$\leftarrow\leftarrow\leftarrow$
\therefore	$\downarrow\downarrow\downarrow$	$\cdots\cdots$	$\square\square\square$	$\square\square\square$	$\square\square\square$	$\square\square\square$
\therefore	$\circ\circ\circ$	$\cdots\cdots$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$
\therefore	$\cdot\cdot\cdot$	$\cdots\cdots$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$

fdsymbol defines $\cdot\cdot\cdot$ as a synonym for $\cdotp\cdotp\cdotp$; \because as a synonym for \downtherefore ; $\cdot\cdot\cdot$ as a synonym for \cdots ; $\cdot\cdot\cdot$ as a synonym for $\leftarrow\leftarrow\leftarrow$; $\circ\circ\circ$ as a synonym for $\square\square\square$; \colon as a synonym for \vdots ; \mathbf{Colon} as a synonym for $\square\square\square$; \mathbf{colon} , $\mathbf{mathcolon}$, and $\mathbf{mathratio}$ as synonyms for \vdots ; and \therefore as a synonym for \uptherefore . (Some of these serve different mathematical roles, such as relations versus binary operators.)

TABLE 274: stix Dots

\therefore	$\cdot\cdot\cdot$	\cdots	$\cdotp\cdotp\cdotp$	$\cdotp\cdotp\cdotp$	$\cdotp\cdotp\cdotp$
\therefore	\because	$\cdots\cdots$	$\square\square\square$	$\square\square\square$	$\square\square\square$
\cdot	$\cdot\cdot$	$\cdots\cdots$	$\leftarrow\leftarrow\leftarrow$	$\leftarrow\leftarrow\leftarrow$	$\leftarrow\leftarrow\leftarrow$
\cdot	$\cdot\cdot\cdot$	$\cdots\cdots$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$
\cdot	$\cdot\cdot\cdot$	$\cdots\cdots$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$	$\cdot\cdot\cdot$

stix defines $\cdot\cdot\cdot$ as a synonym for $\cdotp\cdotp\cdotp$ and \dotsb and \dotsm as synonyms for \cdots .

TABLE 275: mathdots Dots

$\cdots\cdots$ $\cdot\cdot\cdot$ $\cdotp\cdotp\cdotp$ \vdots \vdots

Unlike the default definitions of the above (Table 269), mathdots's commands are designed to scale properly with the surrounding font size.

TABLE 276: *yhmath* Dots
 $\therefore \backslash adots$
TABLE 277: *teubner* Dots
 $:$ $\backslash:$ \vdots $\backslash;$ \vdash $\backslash?$ $::$ $\backslash antilabe$
TABLE 278: *begriff* Begriffsschrift Symbols
 $\vdash \backslash BGassert$ $_ \backslash BGcontent$ $\top \backslash BGnot$
 $\begin{array}{c} b \\[-1ex] a \end{array} \backslash BGconditional\{a\}\{b\}$ $\overline{a} \backslash BGquant\{a\}$

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

TABLE 279: *frege* Begriffsschrift Symbols

$\vdash \backslash Facontent$	$\vdash_{\pi} \backslash Fanncontent$	$\vdash_{\pi\pi} \backslash Fncontent$
$\vdash \backslash Fancontent$	$\vdash_{\pi} \backslash Fcontent$	$\vdash_{\pi\pi} \backslash Fnncontent$
$\vdash_a \backslash Fannquant\{a\}$	$\vdash_a \backslash Faquant\{a\}$	$\vdash_a \backslash Fnquant\{a\}$
$\vdash_a \backslash Fannquantn\{a\}$	$\vdash_a \backslash Faquantn\{a\}$	$\vdash_a \backslash Fnquantn\{a\}$
$\vdash_a \backslash Fannquantnn\{a\}$	$\vdash_a \backslash Faquantnn\{a\}$	$\vdash_a \backslash Fnquantnn\{a\}$
$\vdash_a \backslash Fanquant\{a\}$	$\vdash_a \backslash Fnnquant\{a\}$	$\vdash_a \backslash Fquantn\{a\}$
$\vdash_a \backslash Fanquantn\{a\}$	$\vdash_a \backslash Fnnquantn\{a\}$	$\vdash_a \backslash Fquantnn\{a\}$
$\vdash_a \backslash Fanquantnn\{a\}$	$\vdash_a \backslash Fnnquantnn\{a\}$	$\vdash_a \backslash Fquantnn\{a\}$

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

TABLE 280: *mathcomp* Math Symbols
 $^{\circ}C \backslash tccentigrade \Omega \backslash tcohm \% \backslash tcperthousand$
 $\mu \backslash tcmu \%_{00} \backslash tcpertenthousand$

TABLE 281: marvosym Math Symbols

\triangleleft	<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>
$/$	<code>\Divides</code>	$/$	<code>\MVDivision</code>	$)$	<code>\MVRightBracket</code>
$\not $	<code>\DividesNot</code>	$($	<code>\MVLeftBracket</code>	\neq	<code>\NotCongruent</code>
\Leftrightarrow	<code>\Equivalence</code>	$-$	<code>\MVMinus</code>		

TABLE 282: marvosym Digits

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

TABLE 283: fge Digits

0 `\fgestruckzero` 1 `\fgestruckone`

TABLE 284: dozenal Base-12 Digits

2 `\x` 3 `\e`

TABLE 285: mathabx Mayan Digits

\oplus	<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 286: stix Infinities

\circledinfty	<code>\acidfree</code>	∞	<code>\infnty</code>	∞	<code>\tieinfty</code>
\circlearrowright	<code>\iinfin</code>	ϕ	<code>\nvinfty</code>		

TABLE 287: stix Primes

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

TABLE 288: stix Empty Sets

\emptyset	<code>\emptyset</code>	$\bar{\emptyset}$	<code>\emptysetbar</code>	\emptyset	<code>\varnothing</code>
$\vec{\emptyset}$	<code>\emptysetoarr</code>	$\dot{\emptyset}$	<code>\emptysetocirc</code>		
$\hat{\emptyset}$	<code>\emptysetoarrl</code>	\mathbb{Q}	<code>\revemptyset</code>		

TABLE 289: *AMS* Angles

```
< \angle < \measuredangle < \sphericalangle
```

TABLE 290: MnSymbol Angles

```
< \angle < \measuredangle < \sphericalangle
```

TABLE 291: *fdsymbol* Angles

\angle	\angle	\triangleright	\revangle	\triangleleft	\sphericalangle
\measuredangle	\measuredangle	$\triangleright\!\!\!\triangleright$	\revmeasuredangle	$\triangleleft\!\!\!\triangleleft$	\sphericalangledown
\measuredrightangle	\measuredrightangle	\sqsubset	\rightangle	$\triangleright\!\!\!\triangleright$	\sphericalangleleft
\measuredrightangledot	\measuredrightangledot	\sqsubseteq	\rightanglesquare	$\triangleleft\!\!\!\triangleleft$	\sphericalangleup

`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 292: boisik Angles

```

< \angle           < \rightangle      < \sphericalangle
< \measuredangle   < \rightangledot
< \measuredrightangle < \rightanglesqr

```

TABLE 293: stix Angles

\angle	\backslash angdnr	\triangleleft	\backslash measanglerutone	\triangleright	\backslash rightanglemdot
\angle	\backslash angle	\triangleleft	\backslash measangleultonw	\square	\backslash rightanglesqr
\triangleleft	\backslash angles	\triangleright	\backslash measangleurtone	\triangleleft	\backslash sphericalangle
\leq	\backslash angleubar	\triangleleft	\backslash measuredangle	\triangleright	\backslash sphericalangleup
\triangleright	\backslash gtlpar	\triangleright	\backslash measuredangleleft	\triangleleft	\backslash threeangle
\triangleleft	\backslash measangledltosw	\square	\backslash measuredrightangle	\triangleright	\backslash turnangle
\triangleleft	\backslash measangledrtose	\triangleleft	\backslash rangledownzigzagarrow	\square	\backslash wideangledown
\triangleright	\backslash measangleldtosw	\triangleright	\backslash revangle	\triangleright	\backslash wideangleup
\triangleleft	\backslash measanglelutonw	\leq	\backslash revangleubar		
\triangleright	\backslash measanglerdtose	\sqsubset	\backslash rightangle		

TABLE 294: Miscellaneous L^AT_EX 2 _{ϵ} Math Symbols

\aleph	<code>\aleph</code>	\Box	<code>\Box</code> ^{*,†}	∇	<code>\nabla</code>	\triangle	<code>\triangle</code>
\emptyset	<code>\emptyset</code> [‡]	\diamond	<code>\Diamond</code> [*]	\neg	<code>\neg</code>		
\angle	<code>\angle</code>	∞	<code>\infty</code>	$'$	<code>\prime</code>		
\backslash	<code>\backslash</code>	\backslash	<code>\backslash</code>	$\sqrt{}$	<code>\sqrt{}</code>		<code>\surd</code>

* Not predefined in L^AT_EX 2 _{ϵ} . Use one of the packages `latexsym`, `amsfonts`, `amssymb`, `txfonts`, `pxfonts`, or `wasysym`. Note, however, that `amsfonts` and `amssymb` define `\Diamond` to produce the same glyph as `\lozenge` (“◊”); 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 *AMS*’s `\varnothing` (“∅”, Table 295) to that of L^AT_EX’s `\emptyset`.

TABLE 295: Miscellaneous *AMS* Math Symbols

\backprime	<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>	\triangledown	<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 296: Miscellaneous `wasysym` Math Symbols

\Box	<code>\Box</code>	\Diamond	<code>\Diamond</code>	\mho^*	<code>\mho^*</code>	\varangle	<code>\varangle</code>
--------	-------------------	------------	-----------------------	----------	---------------------	-------------	------------------------

* `wasysym` also defines an `\agem0` symbol, which is the same glyph as `\mho` but is intended for use in text mode.

TABLE 297: Miscellaneous `txfonts/pxfonts` Math Symbols

\blacklozenge	<code>\Diamondblack</code>	λ	<code>\lambda</code>	λbar	<code>\lambdabar</code>
\blacklozenge	<code>\Diamonddot</code>	λ	<code>\lambda</code>	\lambdaslash	<code>\lambdaslash</code>

TABLE 298: Miscellaneous `mathabx` Math Symbols

\circ	<code>\degree</code>	$\#/\#$	<code>\fourth</code>	$\not\sim$	<code>\measuredangle</code>	$\#/\#$	<code>\second</code>
\diagdown	<code>\diagdown</code>	$\#/\#$	<code>\hash</code>	\pitchfork	<code>\pitchfork</code>	$\#/\#$	<code>\sphericalangle</code>
\diagup	<code>\diagup</code>	∞/∞	<code>\infty</code>	\propto	<code>\propto</code>	$\#/\#$	<code>\third</code>
\emptyset	<code>\diameter</code>	\times/\times	<code>\leftthreetimes</code>	\times/\times	<code>\rightthreetimes</code>	$\#/\#$	<code>\varhash</code>

TABLE 299: Miscellaneous MnSymbol Math Symbols

\neg	<code>\backneg</code>	\emptyset	<code>\diameter</code>	\neg	<code>\invneg</code>	\neg	<code>\neg</code>
\backprime	<code>\backprime</code>	∞	<code>\infty</code>	\maltese	<code>\maltese</code>	$/$	<code>\prime</code>
\checkmark	<code>\checkmark</code>	\sqcup	<code>\invbackneg</code>	∇	<code>\nabla</code>	\int	<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 300: Miscellaneous Internal MnSymbol Math Symbols

\cdots	<code>\partialvardint</code>	\cdots	<code>\partialvartint</code>
\cup	<code>\partialvardlanddownint</code>	\cup	<code>\partialvartlanddownint</code>
\cap	<code>\partialvardlandupint</code>	\cap	<code>\partialvartlandupint</code>
\circlearrowleft	<code>\partialvardlcircleleftint</code>	\circlearrowleft	<code>\partialvartlcircleleftint</code>
\circlearrowright	<code>\partialvardlcirclerightint</code>	\circlearrowright	<code>\partialvartlcirclerightint</code>
\square	<code>\partialvardoint</code>	\square	<code>\partialvartooint</code>
\circlearrowleft	<code>\partialvardpoint</code>	\circlearrowleft	<code>\partialvartoint</code>
\circlearrowright	<code>\partialvardrcircleleftint</code>	\circlearrowright	<code>\partialvartrcicleleftint</code>
\circlearrowleft	<code>\partialvardrcirclerightint</code>	\circlearrowleft	<code>\partialvartrcirlcerightint</code>
\dashv	<code>\partialvardstrokedint</code>	\dashv	<code>\partialvartstrokedint</code>
Σ	<code>\partialvardsumint</code>	Σ	<code>\partialvartsumint</code>

These symbols are intended to be used internally by MnSymbol to construct the integrals appearing in Table 80 on page 46 but can nevertheless be used in isolation.

TABLE 301: Miscellaneous fdsymbol Math Symbols

\neg	<code>\backneg</code>	∞	<code>\infty</code>	$/$	<code>\prime</code>
\backprime	<code>\backprime</code>	\neg	<code>\invneg</code>	\emptyset	<code>\revemptyset</code>
\checkmark	<code>\checkmark</code>	\maltese	<code>\maltese</code>	∇	<code>\sector</code>
\emptyset	<code>\emptyset</code>	\neg	<code>\neg</code>	\int	<code>\smallint</code>

fdsymbol defines `\hookdownminus` as a synonym for `\backneg`; `\invneg` and `\invnot` as synonyms for `\backneg`; `\lnot` and `\minushookdown` as synonyms for `\neg`; `\turnedbackneg` as a synonym for `\intprod`; `\turnedneg` as a synonym for `\intprod`; and `\diameter` and `\varnothing` as synonyms for `\emptyset`.

TABLE 302: Miscellaneous boisik Math Symbols

β	<code>\backepsilon</code>	$\dot{+}$	<code>\hermitmatrix</code>	$\not\perp$	<code>\notbot</code>
\backprime	<code>\backprime</code>	\approx	<code>\iinf</code>	$\not\top$	<code>\nottop</code>
\checkmark	<code>\checkmark</code>	\neg	<code>\invnot</code>	ι	<code>\riota</code>
\square	<code>\dalambert</code>	λ	<code>\lambdabar</code>	\sim	<code>\sinewave</code>
\diagdown	<code>\diagdown</code>	λ	<code>\lambdaslash</code>	\emptyset	<code>\varnothing</code>
\diagup	<code>\diagup</code>	\maltese	<code>\maltese</code>		

TABLE 303: Miscellaneous *stix* Math Symbols

\approx	<code>\accurrent</code>	\doteq	<code>\hermitmatrix</code>	\models	<code>\PropertyLine</code>
\backslash	<code>\backslashbackslash</code>	\hyphenbullet	<code>\hyphenbullet</code>	\blacksquare	<code>\QED</code>
\parallel	<code>\bbbrktbrk</code>	$\sim\!\sim$	<code>\hzigzag</code>	$??$	<code>\Question</code>
\perp	<code>\bigbot</code>	Δ	<code>\increment</code>	$\times\!\times$	<code>\rdiagovfdiag</code>
\equiv	<code>\biginterleave</code>	$\blacksquare\!\square$	<code>\inversebullet</code>	$\bowtie\!\bowtie$	<code>\rightouterjoin</code>
\top	<code>\bigtop</code>	\neg	<code>\invnot</code>	\sqcup	<code>\sansLmirrored</code>
\odot	<code>\blacksmiley</code>	\Join	<code>\Join</code>	\sqcap	<code>\sansLturned</code>
$ $	<code>\bracevert</code>	\square	<code>\laplac</code>	\sim	<code>\sinewave</code>
\wedge	<code>\caretinsert</code>	\Join	<code>\leftouterjoin</code>	$\rule{0pt}{1ex}$	<code>\strns</code>
\checkmark	<code>\checkmark</code>	\llcorner	<code>\llarc</code>	\pm	<code>\thermod</code>
\triangleright	<code>\conictaper</code>	\lrcorner	<code>\lrarc</code>	\circlearrowleft	<code>\topcir</code>
\geq	<code>\danger</code>	\maltese	<code>\maltese</code>	\lrcorner	<code>\turnednot</code>
\swarrow	<code>\diagdown</code>	\mathfrak{s}	<code>\mathsection</code>	\lrcorner	<code>\ubrbrak</code>
\searrow	<code>\diagup</code>	\mathfrak{v}	<code>\mathvisible</code>	\lrcorner	<code>\ularc</code>
\varnothing	<code>\diameter</code>	∇	<code>\nabla</code>	\lrcorner	<code>\urarc</code>
$*$	<code>\dingasterisk</code>	\neg	<code>\neg</code>	\sharp	<code>\viewdata</code>
\times	<code>\elinters</code>	\lrcorner	<code>\obrbrak</code>	\wr	<code>\vzigzag</code>
\eth	<code>\eth</code>	\perp	<code>\perps</code>	\yen	<code>\yen</code>
$!!$	<code>\Exclam</code>	\mp	<code>\postalmark</code>	\ddot{o}	<code>\zcmp</code>
$\times\!\times$	<code>\fdiagovrdiag</code>	\cap	<code>\proffline</code>	\gg	<code>\zpipe</code>
$\bowtie\!\bowtie$	<code>\fullouterjoin</code>	\cap	<code>\profsurf</code>	\uparrow	<code>\zproject</code>

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

TABLE 304: Miscellaneous *textcomp* Text-mode Math Symbols

\circ	<code>\textdegree</code>	$\frac{1}{2}$	<code>\textonehalf</code>	$\frac{3}{4}$	<code>\textthreequarters</code>
\div	<code>\textdiv</code>	$\frac{1}{4}$	<code>\textonequarter</code>	$\frac{3}{8}$	<code>\textthreesuperior</code>
$/$	<code>\textfractionsolidus</code>	$\frac{1}{1}$	<code>\textonesuperior</code>	\times	<code>\texttimes</code>
$-$	<code>\textlnot</code>	\pm	<code>\textpm</code>	$\frac{2}{2}$	<code>\texttwosuperior</code>
$-$	<code>\textminus</code>	\sqrt	<code>\textsurd</code>		

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

[†] *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 305: Miscellaneous *fge* Math Symbols

\backslash	<code>\fgebackslash</code>	\cap	<code>\fgecap</code>	\cup	<code>\fgecupacute</code>	\setminus	<code>\fgelangle</code>
\trianglelefteq	<code>\fgebaracute</code>	\simeq	<code>\fgecapbar</code>	\asymp	<code>\fgecupbar</code>	\sqsubset	<code>\fgeupbracket</code>
\asymp	<code>\fgebarcap</code>	\cup	<code>\fgecup</code>	\supseteq	<code>\fgeinfty</code>		

TABLE 306: Miscellaneous `mathdesign` Math Symbols

\llcorner \rightangle

TABLE 307: Math Alphabets

Font sample	Generating command	Required package
ABCdef123	<code>\mathrm{ABCdef123}</code>	<i>none</i>
<i>ABCdef123</i>	<code>\mathit{ABCdef123}</code>	<i>none</i>
<i>ABCdef123</i>	<code>\mathnormal{ABCdef123}</code>	<i>none</i>
<i>ABC</i>	<code>\mathcal{ABC}</code>	<i>none</i>
<i>A^BC</i>	<code>\mathscr{ABC}</code> <i>or</i> <code>\mathcal{ABC}</code>	<code>mathrsfs</code> <code>calrsfs</code>
<i>A^BC</i>	<code>\mathcal{ABC}</code> <i>or</i> <code>\mathscr{ABC}</code>	<code>euscript</code> with the <code>mathcal</code> option <code>euscript</code> with the <code>mathscr</code> option
<i>A^BC</i>	<code>\mathcal{ABC}</code> <i>or</i> <code>\mathscr{ABC}</code>	<code>rsfso</code> <code>rsfso</code> with the <code>scr</code> option
<i>ABC</i>	<code>\mathcal{ABC}</code> <i>or</i> <code>\mathscr{ABC}</code>	<code>urwchancal</code> * <code>urwchancal</code> * with the <code>mathscr</code> option
ABC	<code>\mathbb{ABC}</code>	<code>amsfonts</code> , [§] <code>amssymb</code> , <code>txfonts</code> , or <code>pxfonts</code>
ABC	<code>\varmathbb{ABC}</code>	<code>txfonts</code> or <code>pxfonts</code>
ABCdef123	<code>\mathbb{ABCdef123}</code>	<code>bbold</code> or <code>mathbbol</code> †
ABCdef123	<code>\mathbb{ABCdef123}</code>	<code>mbboard</code> †
ABCdef12	<code>\mathbbm{ABCdef12}</code>	<code>bbm</code>
ABCdef12	<code>\mathbbbmss{ABCdef12}</code>	<code>bbm</code>
ABCdef12	<code>\mathbbmtt{ABCdef12}</code>	<code>bbm</code>
A^BC1	<code>\mathbfds{A^BC1}</code>	<code>dsfont</code>
A^BC1	<code>\mathbfds{ABC1}</code>	<code>dsfont</code> with the <code>sans</code> option
ABC	<code>\symA\symB\symC</code>	<code>china2e</code> ‡
A^BCdef123	<code>\mathfrak{ABCdef123}</code>	<code>eufrak</code>
A^BCdef123	<code>\textfrak{ABCdef123}</code>	<code>yfonts</code> ¶
A^BCdef123	<code>\textswab{ABCdef123}</code>	<code>yfonts</code> ¶
A^BC^cef123	<code>\textgoth{ABCdef123}</code>	<code>yfonts</code> ¶

* `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 307, 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 “ \mathfrak{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 `bbgreekl` option is passed to `mathbbol`—Greek letters. For instance, “ $\langle[\alpha\beta]\rangle$ ” is produced by “`\mathbb{\langle\!\!\langle} \alpha\beta \code{\!\!\rangle\!\!\rangle}`”.

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

[‡] The `\sym...` commands provided by the `GfNA2e` package are actually text-mode commands. They are included in Table 307 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 umlauted blackboard-bold letters: `\symAE` (“ \mathbb{A} ”), `\symOE` (“ \mathbb{O} ”), and `\symUE` (“ \mathbb{U} ”). Note that `GfNA2e` does provide math-mode commands for the most common number-set symbols. These are presented in Table 183 on page 96.

[¶] As their `\text...` names imply, the fonts provided by the `yfonts` package are actually text fonts. They are included in Table 307 because they are frequently used in a mathematical context.

[§] An older (i.e., prior to 1991) version of the `AMS`’s fonts rendered \mathbb{C} , \mathbb{N} , \mathbb{R} , \mathbb{S} , and \mathbb{Z} as C , N , R , S , and Z . As some people prefer the older glyphs—much to the `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 $\text{\LaTeX}\,2_{\varepsilon}$ packages for utilizing the now-obsolete glyphs.

4 Science and technology symbols

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

TABLE 308: `gensymb` Symbols Defined to Work in Both Math and Text Mode

$^{\circ}\text{C}$	<code>\celsius</code>	μ	<code>\micro</code>	$\%$	<code>\perthousand</code>
$^{\circ}$	<code>\degree</code>	Ω	<code>\ohm</code>		

TABLE 309: `wasymp` Electrical and Physical Symbols

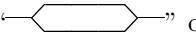
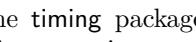
\sim	<code>\AC</code>	\approx	<code>\VHF</code>	$\sim\sim\sim$	<code>\photon</code>	\approx	<code>\HF</code>	$\sim\sim\sim\sim$	<code>\gluon</code>
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TABLE 310: `ifsym` Pulse Diagram Symbols

L_-	<code>\FallingEdge</code>	L_L	<code>\LongPulseLow</code>	L_U	<code>\PulseLow</code>	U_L	<code>\ShortPulseHigh</code>
L_U	<code>\LongPulseHigh</code>	U_L	<code>\PulseHigh</code>	U_-	<code>\RaisingEdge</code>	U_T	<code>\ShortPulseLow</code>

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

$-$	<code>l</code>	$-$	<code>m</code>	$-$	<code>h</code>	$-$	<code>d</code>	$<$	<code><</code>	$>$	<code>></code>
$_$	<code>L</code>	$_$	<code>M</code>	$_$	<code>H</code>	$_$	<code>D</code>	$<$	<code><<</code>	$>$	<code>>></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 “`B`”.

TABLE 311: `ar` Aspect Ratio Symbol

$\mathcal{A}R$ `\AR`

TABLE 312: `textcomp` Text-mode Science and Engineering Symbols

$^{\circ}\text{C}$	<code>\textcelsius</code>	U	<code>\textmho</code>	μ	<code>\textmu</code>	Ω	<code>\textohm</code>
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TABLE 313: *steinmetz* Extensible Phasor Symbol
 \underline{abc} $\backslash\text{phase}\{abc\}$

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

TABLE 314: *emf* Electromotive Force Symbols

\mathcal{E}	<code>\emf</code> with package option <code>boondox</code> (default)
\mathcal{E}	<code>\emf</code> with package option <code>cal</code> *
\mathcal{E}	<code>\emf</code> with package option <code>calligra</code>
\mathcal{E}	<code>\emf</code> with package option <code>chorus</code>
\mathcal{E}	<code>\emf</code> with package option <code>cmr</code>
\mathcal{E}	<code>\emf</code> with package option <code>fourier</code>
\mathcal{E}	<code>\emf</code> with package option <code>frcursive</code>
\mathcal{E}	<code>\emf</code> with package option <code>miam</code>
\mathcal{E}	<code>\emf</code> with package option <code>rsfs</code>

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

TABLE 315: *wasy sym* Astronomical Symbols

$\text{\rm \texttt{\textcircled{M}}}$	<code>\mercury</code>	$\text{\rm \texttt{\textcircled{E}}}$	<code>\earth</code>	$\text{\rm \texttt{\textcircled{J}}}$	<code>\jupiter</code>	$\text{\rm \texttt{\textcircled{U}}}$	<code>\uranus</code>	$\text{\rm \texttt{\textcircled{P}}}$	<code>\pluto</code>
$\text{\rm \texttt{\textcircled{V}}}$	<code>\venus</code>	$\text{\rm \texttt{\textcircled{M}}}$	<code>\mars</code>	$\text{\rm \texttt{\textcircled{S}}}$	<code>\saturn</code>	$\text{\rm \texttt{\textcircled{N}}}$	<code>\neptune</code>		
$\text{\rm \texttt{\textcircled{S}}}$	<code>\astrosun</code>	$\text{\rm \texttt{\textcircled{F}}}$	<code>\fullmoon</code>	$\text{\rm \texttt{\textcircled{L}}}$	<code>\leftmoon</code>	$\text{\rm \texttt{\textcircled{N}}}$	<code>\newmoon</code>	$\text{\rm \texttt{\textcircled{R}}}$	<code>\rightmoon</code>
$\text{\rm \texttt{\textcircled{A}}}$	<code>\aries</code>	$\text{\rm \texttt{\textcircled{C}}}$	<code>\cancer</code>	$\text{\rm \texttt{\textcircled{L}}}$	<code>\libra</code>	$\text{\rm \texttt{\textcircled{Q}}}$	<code>\aquarius</code>		
$\text{\rm \texttt{\textcircled{T}}}$	<code>\taurus</code>	$\text{\rm \texttt{\textcircled{L}}}$	<code>\leo</code>	$\text{\rm \texttt{\textcircled{S}}}$	<code>\scorpio</code>	$\text{\rm \texttt{\textcircled{C}}}$	<code>\capricornus</code>		
$\text{\rm \texttt{\textcircled{G}}}$	<code>\gemini</code>	$\text{\rm \texttt{\textcircled{V}}}$	<code>\virgo</code>	$\text{\rm \texttt{\textcircled{S}}}$	<code>\sagittarius</code>	$\text{\rm \texttt{\textcircled{P}}}$	<code>\pisces</code>		
$\text{\rm \texttt{\textcircled{N}}}$	<code>\ascnode</code>	$\text{\rm \texttt{\textcircled{D}}}$	<code>\descnode</code>	$\text{\rm \texttt{\textcircled{O}}}$	<code>\conjunction</code>	$\text{\rm \texttt{\textcircled{O}}}$	<code>\opposition</code>	$\text{\rm \texttt{\textcircled{V}}}$	<code>\vernal</code>

TABLE 316: marvosym Astronomical Symbols

☿	\Mercury	♂	\Earth	♃	\Jupiter	♄	\Uranus	♅	\Pluto
♀	\Venus	♂'	\Mars	♁	\Saturn	♃'	\Neptune	♆	\
☽	\Moon	○	\Sun						
♈	\Aries	♉	\Cancer	♊	\Libra	♋	\Capricorn		
♉	\Taurus	♌	\Leo	♏	\Scorpio	♒	\Aquarius		
♊	\Gemini	♍	\Virgo	♐	\Sagittarius	♓	\Pisces		

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

TABLE 317: fontawesome Astronomical Symbols

♂	\faMars	☾	\faMoon0	♀	\faVenus
☿	\faMercury	☀	\faSun0		

TABLE 318: mathabx Astronomical Symbols

♀	\Mercury	⊕	\Earth	♃	\Jupiter	♂	\Uranus	♅	\Pluto
♀	\Venus	♂	\Mars	♁	\Saturn	Ψ	\Neptune	♆	\varEarth
○	\fullmoon	☾	\leftmoon	●	\newmoon	☽	\rightmoon	○	\Sun
♈	\Aries	♉	\Taurus	♊	\Gemini				

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

TABLE 319: stix Astronomical Symbols

○	\astrosun	☾	\leftmoon	☽	\rightmoon	⊗	\sun
---	-----------	---	-----------	---	------------	---	------

TABLE 320: starfont Astronomical Symbols

\textdollar	\Mercury	σ^{\bullet}	\Mars	$\text{\textcircled{U}}$	\Uranus	$\text{\textcircled{d}}$	\varTerra
\textdagger	\Venus	$\text{\textcircled{j}}$	\Jupiter	$\text{\textcircled{n}}$	\Neptune	$\text{\textcircled{u}}$	\varUranus
\oplus	\Terra	$\text{\textcircled{s}}$	\Saturn	$\text{\textcircled{p}}$	\Pluto	$\text{\textcircled{z}}$	\varPluto
\odot	\Sun	$\text{\textcircled{m}}$	\Moon	$\text{\textcircled{v}}$	\varMoon		
\textdagger	\Cupido	$\text{\textcircled{k}}$	\Zeus	$\text{\textcircled{w}}$	\Apollon	$\text{\textcircled{x}}$	\Vulkanus
\textdagger	\Hades	$\text{\textcircled{t}}$	\Kronos	$\text{\textcircled{y}}$	\Admetos	$\text{\textcircled{x}}$	\Poseidon
\emptyset	\Lilith	$\text{\textcircled{a}}$	\NorthNode	$\text{\textcircled{o}}$	\SouthNode		
\textdagger	\Amor	$\text{\textcircled{r}}$	\Eros	$\text{\textcircled{f}}$	\Juno	$\text{\textcircled{g}}$	\Sappho
\textdagger	\Ceres	$\text{\textcircled{z}}$	\Hidalgo	$\text{\textcircled{e}}$	\Pallas	$\text{\textcircled{h}}$	\Vesta
\textdagger	\Chiron	$\text{\textcircled{y}}$	\Hygiea	$\text{\textcircled{d}}$	\Psyche		
$\text{\textcircled{*}}$	\Fortune						
\textdagger	\Aries	$\text{\textcircled{l}}$	\Leo	$\text{\textcircled{a}}$	\Sagittarius	$\text{\textcircled{r}}$	\varCapricorn
\textdagger	\Taurus	$\text{\textcircled{m}}$	\Virgo	$\text{\textcircled{b}}$	\Capricorn		
\textdagger	\Gemini	$\text{\textcircled{n}}$	\Libra	$\text{\textcircled{c}}$	\Aquarius		
\textdagger	\Cancer	$\text{\textcircled{p}}$	\Scorpio	$\text{\textcircled{d}}$	\Pisces		
\textdagger	\Conjunction	\square	\Square	$\text{\textcircled{v}}$	\Semisextile		
\textdagger	\Opposition	$\text{\textcircled{x}}$	\Sextile	$\text{\textcircled{z}}$	\Semisquare		
Δ	\Trine	$\text{\textcircled{w}}$	\Quincunx	$\text{\textcircled{e}}$	\Sesquiquadrate		
A^{sc}	\ASC	E^p	\EastPoint	M^c	\MC		
D^{sc}	\DSC	I^c	\IC	V^x	\Vertex		
$D^!$	\Direct	R_x	\Retrograde	$S^!$	\Station		
Δ	\Air	$\text{\textcircled{v}}$	\Earth	Δ	\Fire	∇	\Water
$N^{!!}$	\Natal	\star	\Pentagram	R^{ad}	\Radix		

TABLE 321: wasysym APL Symbols

\square	\APLbox	$\text{\textcircled{:}}$	\APLinv	$*$	\APLstar
\textdagger	\APLcomment	$\text{\textcircled{b}}$	\APLleftarrowbox	Δ	\APLup
∇	\APLdown	$\text{\textcircled{o}}$	\APLlog	$\text{\textcircled{t}}$	\APLuparrowbox
$\text{\textcircled{l}}$	\APLdownarrowbox	$\text{\textcircled{m}}$	\APLminus	$\text{\textcircled{+}}$	\notbackslash
\square	\APLinput	$\text{\textcircled{d}}$	\APLrightarrowbox	$\text{\textcircled{-}}$	\notslash
a	\APLcirc{a}	$\text{\textcircled{a}}$	\APLnot{a}	$\text{\textcircled{f}}$	\APLvert{a}

TABLE 322: stix APL Symbols

	\APLboxquestion		\APLnotbackslash
	\APLboxupcaret		\APLnotslash

TABLE 323: apl APL Symbols

	\AB	..	\DD	¶	\GD	†	\LK	◊	\PD	↑	\UA	G	\ZG	Q	\ZQ
α	\AM	⊥	\DE	≥	\GE	○	\LO	■	\QQ	-	\US	H	\ZH	B	\ZR
\	\BL	▽	\DL	→	\GO	▷	\LU	}	\RB	○	\UU	I	\ZI	S	\ZS
□	\BX	◊	\DM	▲	\GU	≠	\NE	¬	\RK	▲	\XQ	J	\ZJ	T	\ZT
λ	\CB	■	\DQ	¤	\IB	-	\NG	ρ	\RO	¤	\ZA	K	\ZK	U	\ZU
Γ	\CE	∩	\DU	∞	\IO	≀	\NN	℃	\RU	B	\ZB	L	\ZL	V	\ZV
⌚	\CO	τ	\EN	{	\LB	▼	\NR	∅	\RV	C	\ZC	M	\ZM	W	\ZW
◦	\CR	€	\EP	Δ	\LD	~	\NT	◦	\SO	D	\ZD	N	\ZN	X	\ZX
/	\CS	l	\FL	≤	\LE	ω	\OM	SS	\SS	E	\ZE	O	\ZO	Y	\ZY
↓	\DA	¤	\FM	⊗	\LG	∨	\OR	◊	\TR	F	\ZF	P	\ZP	Z	\ZZ

TABLE 324: marvosym Computer Hardware Symbols

	\ComputerMouse		\ParallelPort		\SerialInterface
	\Keyboard		\Printer		\SerialPort

TABLE 325: keystroke Computer Keys

	\Alt		\Enter*		\PrtSc*
	\AltGr		\Esc*		\RArrow
	\Break*		\Home*		\Return
	\BSpace [†]		\Ins*		\Scroll*
	\Ctrl*		\LArrow		\Shift*
	\DArrow		\NumLock		\Spacebar
	\Del*		\PgDown*		\Tab [†]
	\End*		\PgUp*		\UArrow

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

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

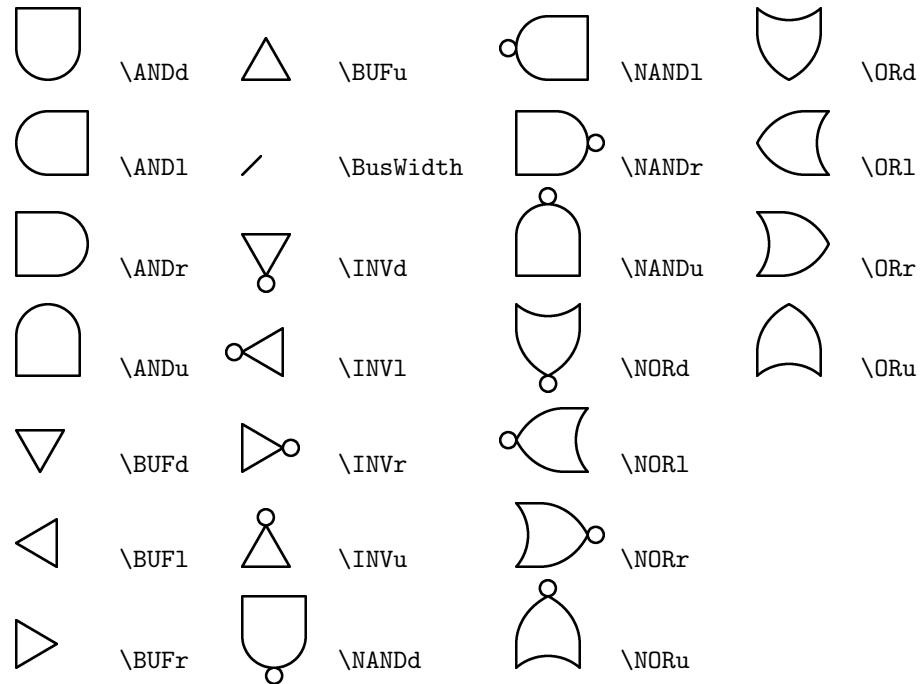
The `\keystroke` command draws a key with an arbitrary label. For example, “`\keystroke{F7}`” produces “”.

TABLE 326: 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 327: logic Logic Gates

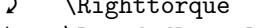
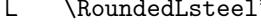


The *logic* package implements the digital logic-gate symbols specified by the U.S. Department of Defense’s MIL-STD-806 standard. Note that on CTAN, the package is *called* *logic*, but the package is *loaded* using \usepackage{milstd}. (There was already a—completely unrelated—*milstd* package on CTAN at the time of *logic*’s release.) Consequently, package details are listed under *milstd* in Table 532 and Table 533 on page 247.

TABLE 328: marvosym Communication Symbols

 \Email	 \fax	 \Faxmachine	 \Lightning	 \Pickup
 \EmailCT	 \FAX	 \Letter	 \Mobilefone	 \Telefon

TABLE 329: marvosym Engineering Symbols

 \Beam	 \Force	 \Octosteel	 \RoundedTTsteel
 \Bearing	 \Hexasteel	 \Rectpipe	 \Squarepipe
 \Circpipe	 \Lefttorque	 \Rectsteel	 \Squaresteel
 \Circsteel	 \Lineload	 \Righttorque	 \Tsteel
 \Fixedbearing	 \Loosebearing	 \RoundedLsteel*	 \TTsteel
 \Flatsteel	 \Lsteel	 \RoundedTsteel*	

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

TABLE 330: wasysym Biological Symbols

 \female  \male

TABLE 331: stix Biological Symbols

 \female	 \male
 \Hermaphrodite	 \neuter

TABLE 332: marvosym Biological Symbols

 \FEMALE	 \FemaleMale	 \Male	 \Neutral
 \Female	 \Hermaphrodite	 \MALE	
 \FemaleFemale	 \HERMAPHRODITE	 \MaleMale	

TABLE 333: fontawesome Biological Symbols

 \faGenderless	 \faMarsStrokeH	 \faTransgenderAlt
 \faMars	 \faMarsStrokeV	 \faVenus
 \faMarsDouble	 \faNeuter	 \faVenusDouble
 \faMarsStroke	 \faTransgender	 \faVenusMars

fontawesome defines \faIntersex as a synonym for \faTransgender

TABLE 334: marvosym Safety-related Symbols

 \Biohazard	 \CEsign	 \Explosionsafe	 \Radioactivity
 \BSEfree	 \Estatically	 \Laserbeam	 \Stopsign

TABLE 335: feyn Feynman Diagram Symbols

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

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 336: svrsymbols Physics Ideograms

	\adsorbate		\experimentalsym		\protein
	\adsorbent		\externalsym		\proton
μ^+	\antimuon		\fermiDistrib		\quadrupole
$\bar{\nu}$	\antineutrino		\fermion		\quark
\bar{n}	\antineutron		\Gluon		\quarkb
p^-	\antiproton		\graphene		\quarkc
\bar{q}	\antiquark		\graviton		\quarkd
\bar{b}	\antiquarkb		\hbond		\quarks
\bar{c}	\antiquarkc		\Higgsboson		\quarkt
\bar{d}	\antiquarkd		\hole		\quarku
\bar{s}	\antiquarks		\interaction		\reference
\bar{t}	\antiquarkt		\internalsym		\resistivity
\bar{u}	\antiquarku		\ion		\rhomesonminus
$\&$	\anyon		\ionicbond		\rhomesonnull
\star	\assumption		\Jpsimeson		\rhomesonplus
\otimes	\atom		\Kaonminus		\solid

(continued on next page)

(continued from previous page)

\star	<code>\bigassumption</code>	K^o	<code>\Kaonnull</code>	$\not\star$	<code>\spin</code>
$\star\star$	<code>\Bigassumption</code>	K^+	<code>\Kaonplus</code>	$\not\star\star$	<code>\spindown</code>
$\star\star\star$	<code>\biggassumption</code>	$\not\rightarrow$	<code>\magnon</code>	$\not\star\star\star$	<code>\spinup</code>
B^-	<code>\Bmesonminus</code>	\mathcal{M}	<code>\maxwellDistrib</code>	$\not B$	<code>\surface</code>
B^o	<code>\Bmesonnull</code>	\mathcal{M}	<code>\metalbond</code>	$\not B$	<code>\svrexample</code>
B^+	<code>\Bmesonplus</code>	\mathcal{M}	<code>\method</code>	$\not f$	<code>\svrphoton</code>
\rightarrow	<code>\bond</code>	μ^-	<code>\muon</code>	$\not t$	<code>\tachyon</code>
\rangle	<code>\boseDistrib</code>	ν	<code>\neutrino</code>	τ^-	<code>\tauleptonminus</code>
\langle	<code>\boson</code>	n^o	<code>\neutron</code>	τ^+	<code>\tauleptonplus</code>
\odot	<code>\conductivity</code>	$\not\bullet$	<code>\nucleus</code>	T^-	<code>\Tmesonminus</code>
\leftarrow	<code>\covbond</code>	$\not\curvearrowright$	<code>\orbit</code>	T^o	<code>\Tmesonnull</code>
d^p	<code>\dipole</code>	ϕ	<code>\phimeson</code>	T^+	<code>\Tmesonplus</code>
D^-	<code>\Dmesonminus</code>	ϕ^o	<code>\phimesonnull</code>	$\not\leftarrow$	<code>\triplecovbond</code>
D^o	<code>\Dmesonnull</code>	\mathcal{F}	<code>\phonon</code>	γ	<code>\Upsilonilonmeson</code>
D^+	<code>\Dmesonplus</code>	π^-	<code>\pionminus</code>	$\not\gamma$	<code>\varphoton</code>
$\leftarrow\leftarrow$	<code>\doublecovbond</code>	π^o	<code>\pionnull</code>	\bullet	<code>\water</code>
e^-	<code>\electron</code>	π^+	<code>\pionplus</code>	W	<code>\Wboson</code>
Ξ	<code>\errorsym</code>	$\not e$	<code>\plasmon</code>	W^-	<code>\Wbosonminus</code>
η	<code>\etameson</code>	$\not\mathfrak{x}$	<code>\polariton</code>	W^+	<code>\Wbosonplus</code>
η'	<code>\etamesonprime</code>	$\not\mathcal{F}$	<code>\polaron</code>	Z	<code>\Zboson</code>
$\exists h^+$	<code>\exciton</code>	e^+	<code>\positron</code>		

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 L^AT_EX 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 337: `bbding` Arrows

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

TABLE 338: `pifont` Arrows

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

TABLE 339: adfsymbols Arrows

\Rightarrow	<code>\adfarrows{1}</code>	\nearrow	<code>\adfarrowsne{1}</code>	\Downarrow	<code>\adfarrows{2}</code>	\nwarrow	<code>\adfarrowsw{1}</code>
\rightarrow	<code>\adfarrows{2}</code>	\nearrow	<code>\adfarrowsne{2}</code>	\downarrow	<code>\adfarrows{3}</code>	\nwarrow	<code>\adfarrowsw{2}</code>
\blackrightarrow	<code>\adfarrows{3}</code>	\nearrow	<code>\adfarrowsne{3}</code>	\downarrow	<code>\adfarrows{4}</code>	\nwarrow	<code>\adfarrowsw{3}</code>
$\rightarrow\rightarrow$	<code>\adfarrows{4}</code>	\nearrow	<code>\adfarrowsne{4}</code>	\downarrow	<code>\adfarrows{5}</code>	\nwarrow	<code>\adfarrowsw{4}</code>
$\rightarrow\rightarrow$	<code>\adfarrows{5}</code>	\nearrow	<code>\adfarrowsne{5}</code>	\downarrow	<code>\adfarrows{6}</code>	\nwarrow	<code>\adfarrowsw{5}</code>
$\rightarrow\rightarrow$	<code>\adfarrows{6}</code>	\nearrow	<code>\adfarrowsne{6}</code>	\Downarrow	<code>\adfarrows{7}</code>	\nwarrow	<code>\adfarrowsw{6}</code>
\uparrow	<code>\adfarrown{1}</code>	\nwarrow	<code>\adfarrownw{1}</code>	\nwarrow	<code>\adfarrows{8}</code>	\nwarrow	<code>\adfarrowsw{1}</code>
\uparrow	<code>\adfarrown{2}</code>	\nwarrow	<code>\adfarrownw{2}</code>	\nwarrow	<code>\adfarrows{9}</code>	\nwarrow	<code>\adfarrowsw{2}</code>
\uparrow	<code>\adfarrown{3}</code>	\nwarrow	<code>\adfarrownw{3}</code>	\nwarrow	<code>\adfarrows{10}</code>	\nwarrow	<code>\adfarrowsw{3}</code>
\uparrow	<code>\adfarrown{4}</code>	\nwarrow	<code>\adfarrownw{4}</code>	\nwarrow	<code>\adfarrows{11}</code>	\nwarrow	<code>\adfarrowsw{4}</code>
\uparrow	<code>\adfarrown{5}</code>	\nwarrow	<code>\adfarrownw{5}</code>	\nwarrow	<code>\adfarrows{12}</code>	\nwarrow	<code>\adfarrowsw{5}</code>
\uparrow	<code>\adfarrown{6}</code>	\nwarrow	<code>\adfarrownw{6}</code>	\nwarrow	<code>\adfarrows{13}</code>	\nwarrow	<code>\adfarrowsw{6}</code>
		\rightsquigarrow	<code>\adfhalfarrowleft</code>		\rightsquigarrow	<code>\adfhalfarrowright</code>	
		\rightsquigarrow	<code>\adfhalfarrowleftsolid</code>		\rightsquigarrow	<code>\adfhalfarrowrightsolid</code>	

Technically, the digit at the end of each `\adfarrows{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 `\adfarrows` command. For example, both `\adfarrows{19}` and `\adfarrows[comic]{east}` produce “ \blackrightarrow ”. See the `adfsymbols` documentation for more information.

TABLE 340: adforn Arrows

\blackleftarrow	<code>\adfhalfleftarrow</code>	\blackrightarrow	<code>\adfhalfrightarrowhead</code>
\blacktriangleleft	<code>\adfhalfleftarrowhead</code>	\blacktriangleleft	<code>\adleftarrowhead</code>
\blacktriangleright	<code>\adfhalfrightarrow</code>	\blacktriangleright	<code>\adrightarrowhead</code>

TABLE 341: arev Arrows

\blacktriangleright `\arrowbullet`

TABLE 342: fontawesome Arrows

\downarrow	<code>\faArrowCircleDown</code>	\downarrow	<code>\faArrowDown</code>	\downarrow	<code>\faLongArrowDown</code>
\circlearrowleft	<code>\faArrowCircleLeft</code>	\leftarrow	<code>\faArrowLeft</code>	\leftarrow	<code>\faLongArrowLeft</code>
\circlearrowdown	<code>\faArrowCircleDown</code>	\rightarrow	<code>\faArrowRight</code>	\rightarrow	<code>\faLongArrowRight</code>
\circlearrowleft	<code>\faArrowCircleLeft</code>	\nexists	<code>\faArrows</code>	\uparrow	<code>\faLongArrowUp</code>
\circlearrowright	<code>\faArrowCircleRight</code>	\nexists	<code>\faArrowsAlt</code>	\textcirclearrowleft	<code>\faRepeat</code>
\circlearrowup	<code>\faArrowCircleUp</code>	\leftrightarrow	<code>\faArrowsH</code>	\textcirclearrowright	<code>\faUndo</code>
\circlearrowright	<code>\faArrowCircleRight</code>	\updownarrow	<code>\faArrowsV</code>		
\circlearrowup	<code>\faArrowCircleUp</code>	\uparrow	<code>\faArrowUp</code>		

`fontawesome` defines `\faRotateLeft` as a synonym for `\faUndo` and `\faRotateRight` as a synonym for `\faRepeat`.

TABLE 343: fontawesome Chevrons

❶ \faChevronCircleDown	❷ \faChevronCircleUp	❸ \faChevronRight
❹ \faChevronCircleLeft	❺ \faChevronDown	❻ \faChevronUp
❻ \faChevronCircleRight	❻ \faChevronLeft	

TABLE 344: marvosym Scissors

✂ \CutLeft	---	\CuttingLine	✂ \RightScissors
✂ \CutRight	✂	\LeftScissors	

TABLE 345: bbdng Scissors

✂ \ScissorHollowLeft	✂ \ScissorLeftBrokenTop
✂ \ScissorHollowRight	✂ \ScissorRight
✂ \ScissorLeft	✂ \ScissorRightBrokenBottom
✂ \ScissorLeftBrokenBottom	✂ \ScissorRightBrokenTop

TABLE 346: pifont Scissors

✂ \ding{33}	✂ \ding{34}	✂ \ding{35}	✂ \ding{36}
-------------	-------------	-------------	-------------

TABLE 347: dingbat Pencils



TABLE 348: arev Pencils

✏ \pencil

TABLE 349: fontawesome Pencils

-pencil \faPencil	-square \faPencilSquare	-square0 \faPencilSquare0
-------------------	-------------------------	---------------------------

TABLE 350: bbdng Pencils and Nibs

↳ \NibLeft	↳ \PencilLeft	↳ \PencilRightDown
↳ \NibRight	↳ \PencilLeftDown	↳ \PencilRightUp
↳ \NibSolidLeft	↳ \PencilLeftUp	
↳ \NibSolidRight	↳ \PencilRight	

TABLE 351: pifont Pencils and Nibs

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

TABLE 352: dingbat Fists

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

TABLE 353: bbding Fists

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

TABLE 354: pifont Fists

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

TABLE 355: fourier Fists

\lefthand \righthand

TABLE 356: arev Fists

\pointright

TABLE 357: fontawesome Fists

\faHandLizard0	\faHandPaper0	\faHandSpock0
\faHand0Down	\faHandPeace0	\faThumbsDown
\faHand0Left	\faHandPointer0	\faThumbs0Down
\faHand0Right	\faHandRock0	\faThumbs0Up
\faHand0Up	\faHandScissors0	\faThumbsUp

fontawesome defines \faHandGrab0 as a synonym for \faHandRock0 and \faHandStop0 as a synonym for \faHandPaper0.

TABLE 358: *bding* Crosses and Plusses

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

TABLE 359: *pifont* Crosses and Plusses

+	<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 360: *adfsymbols* Crosses and Plusses

x	<code>\adfbullet{4}</code>	x	<code>\adfbullet{6}</code>	x	<code>\adfbullet{8}</code>	x	<code>\adfbullet{10}</code>
+	<code>\adfbullet{5}</code>	+	<code>\adfbullet{7}</code>	+	<code>\adfbullet{9}</code>		

TABLE 361: *arev* Crosses

\textcircledast	<code>\eastcross</code>	\textcircledast	<code>\westcross</code>
--------------------------	-------------------------	--------------------------	-------------------------

TABLE 362: *bding* Xs and Check Marks

\checkmark	<code>\Checkmark</code>	\times	<code>\XSolid</code>	\times	<code>\XSolidBrush</code>
\checkmark	<code>\CheckmarkBold</code>	\times	<code>\XSolidBold</code>		

TABLE 363: *pifont* Xs and Check Marks

\checkmark	<code>\ding{51}</code>	\times	<code>\ding{53}</code>	\times	<code>\ding{55}</code>
\checkmark	<code>\ding{52}</code>	\times	<code>\ding{54}</code>	\times	<code>\ding{56}</code>

TABLE 364: *wasysym* Xs and Check Marks

\square	<code>\CheckedBox</code>	\square	<code>\Square</code>	\square	<code>\XBox</code>
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TABLE 365: *marvosym* Xs and Check Marks

\square	<code>\Checkedbox</code>	\times	<code>\CrossedBox*</code>	\square	<code>\HollowBox</code>
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* *marvosym* defines `\Crossedbox` as a synonym for `\CrossedBox`.

TABLE 366: arev Xs and Check Marks

✓	<code>\ballotcheck</code>	✗	<code>\ballotx</code>
---	---------------------------	---	-----------------------

TABLE 367: fontawesome Xs and Check Marks

✓	<code>\faCheck</code>	☒	<code>\faCheckSquare</code>	✖	<code>\faTimesCircle</code>
✓	<code>\faCheckCircle</code>	☒	<code>\faCheckSquare0</code>	✖	<code>\faTimesCircle0</code>
✓	<code>\faCheckCircle0</code>	✗	<code>\faTimes*</code>		

* `fontawesome` defines both `\faClose` and `\faRemove` as synonyms for `\faTimes`.

TABLE 368: pifont Circled Numerals

①	<code>\ding{172}</code>	❶	<code>\ding{182}</code>	①	<code>\ding{192}</code>	❶	<code>\ding{202}</code>
②	<code>\ding{173}</code>	❷	<code>\ding{183}</code>	②	<code>\ding{193}</code>	❷	<code>\ding{203}</code>
③	<code>\ding{174}</code>	❸	<code>\ding{184}</code>	③	<code>\ding{194}</code>	❸	<code>\ding{204}</code>
④	<code>\ding{175}</code>	❹	<code>\ding{185}</code>	④	<code>\ding{195}</code>	❹	<code>\ding{205}</code>
⑤	<code>\ding{176}</code>	❺	<code>\ding{186}</code>	⑤	<code>\ding{196}</code>	❺	<code>\ding{206}</code>
❻	<code>\ding{177}</code>	❻	<code>\ding{187}</code>	❻	<code>\ding{197}</code>	❻	<code>\ding{207}</code>
❷	<code>\ding{178}</code>	❷	<code>\ding{188}</code>	❷	<code>\ding{198}</code>	❷	<code>\ding{208}</code>
❸	<code>\ding{179}</code>	❸	<code>\ding{189}</code>	❸	<code>\ding{199}</code>	❸	<code>\ding{209}</code>
❹	<code>\ding{180}</code>	❹	<code>\ding{190}</code>	❹	<code>\ding{200}</code>	❹	<code>\ding{210}</code>
❻	<code>\ding{181}</code>	❻	<code>\ding{191}</code>	❻	<code>\ding{201}</code>	❻	<code>\ding{211}</code>

`pifont` (part of the `psnfss` package) provides a `dingautolist` environment which resembles `enumerate` but uses circled numbers as bullets.⁴ See the `psnfss` documentation for more information.

TABLE 369: wasysym Stars

◊	<code>\davidsstar</code>	✳	<code>\hexstar</code>	✳	<code>\varhexstar</code>
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⁴In fact, `dingautolist` can use any set of consecutive Zapf Dingbats symbols.

TABLE 370: bbdng Stars, Flowers, and Similar Shapes

* \Asterisk	✿ \FiveFlowerPetal	◆ \JackStar
* \AsteriskBold	★ \FiveStar	◆ \JackStarBold
* \AsteriskCenterOpen	☆ \FiveStarCenterOpen	✿ \SixFlowerAlternate
* \AsteriskRoundedEnds	☆ \FiveStarConvex	✿ \SixFlowerAltPetal
* \AsteriskThin	☆ \FiveStarLines	✿ \SixFlowerOpenCenter
* \AsteriskThinCenterOpen	☆ \FiveStarOpen	✿ \SixFlowerPetalDotted
◊ \DavidStar	● \FiveStarOpenCircled	✿ \SixFlowerPetalRemoved
★ \DavidStarSolid	★ \FiveStarOpenDotted	✿ \SixFlowerRemovedOpenPetal
* \EightAsterisk	★ \FiveStarOutline	★ \SixStar
✿ \EightFlowerPetal	★ \FiveStarOutlineHeavy	✿ \SixteenStarLight
* \EightFlowerPetalRemoved	★ \FiveStarShadow	✿ \Snowflake
* \EightStar	◆ \FourAsterisk	✿ \SnowflakeChevron
* \EightStarBold	✿ \FourCloverOpen	✿ \SnowflakeChevronBold
* \EightStarConvex	✿ \FourCloverSolid	✿ \Sparkle
* \EightStarTaper	◆ \FourStar	✿ \SparkleBold
✿ \FiveFlowerOpen	✿ \FourStarOpen	✿ \TwelveStar

TABLE 371: pifont Stars, Flowers, and Similar Shapes

◊ \ding{65}	★ \ding{74}	* \ding{83}	* \ding{92}	* \ding{101}
◆ \ding{66}	★ \ding{75}	* \ding{84}	* \ding{93}	* \ding{102}
◆ \ding{67}	★ \ding{76}	* \ding{85}	* \ding{94}	* \ding{103}
◆ \ding{68}	★ \ding{77}	* \ding{86}	✿ \ding{95}	* \ding{104}
◆ \ding{69}	★ \ding{78}	* \ding{87}	✿ \ding{96}	* \ding{105}
◆ \ding{70}	★ \ding{79}	* \ding{88}	✿ \ding{97}	* \ding{106}
◆ \ding{71}	★ \ding{80}	* \ding{89}	✿ \ding{98}	* \ding{107}
★ \ding{72}	* \ding{81}	✿ \ding{90}	* \ding{99}	
★ \ding{73}	* \ding{82}	* \ding{91}	* \ding{100}	

TABLE 372: adfsymbols Stars, Flowers, and Similar Shapes

◊ \adfbullet{1}	* \adfbullet{13}	◊ \adfbullet{18}	◊ \adfbullet{23}
◊ \adfbullet{2}	◊ \adfbullet{14}	◊ \adfbullet{19}	◊ \adfbullet{24}
* \adfbullet{3}	◊ \adfbullet{15}	◦ \adfbullet{20}	* \adfbullet{25}
* \adfbullet{11}	◊ \adfbullet{16}	◦ \adfbullet{21}	◊ \adfbullet{26}
* \adfbullet{12}	◊ \adfbullet{17}	◊ \adfbullet{22}	

TABLE 373: adforn Stars

* \adfast{1}	* \adfast{3}	* \adfast{5}	* \adfast{7}	* \adfast{9}
* \adfast{2}	* \adfast{4}	* \adfast{6}	* \adfast{8}	* \adfast{10}

TABLE 374: fontawesome Stars

★ \faStar ▲ \faStarHalf ★ \faStarHalf0 ☆ \faStar0

fontawesome defines both \faStarHalfEmpty and \faStarHalfFull as synonyms for \faStarHalf0.

TABLE 375: fourier Fleurons and Flowers

⌚ \aldine	❖ \decoone	⌚ \floweroneright
⌚ \aldineleft	❖ \decosix	⌚ \leafleft
⌚ \aldineright	❖ \decothreeleft	⌚ \leafNE
⌚ \aldinesmall	❖ \decothreeright	⌚ \leafright
⌚ \decofourleft	❖ \decotwo	+ \starredbullet
⌚ \decofourright	⌚ \floweroneleft	

TABLE 376: adforn Fleurons and Flowers

⌚ \adfdownhalfleafleft	⌚ \adfdownhalfleafright
⌚ \adfdownleafleft	⌚ \adfdownleafright
⌚ \adfflatdownhalfleafleft	⌚ \adfflatdownhalfleafright
⌚ \adfflatdownoutlineleafleft	⌚ \adfflatdownoutlineleafright
⌚ \adfflatleafleft	⌚ \adfflatleafright
⌚ \adfflatleafoutlineleft	⌚ \adfflatleaflineright
⌚ \adfflatleafsolidleft	⌚ \adfflatleafsolidright
⌚ \adfflowerleft	⌚ \adfflowerright
⌚ \adfhalfleafleft	⌚ \adfhalfleafright
⌚ \adfhangingflatleafleft	⌚ \adfhangingflatleafright
⌚ \adfhangingingleafleft	⌚ \adfhangingingleafright
⌚ \adfleafleft	⌚ \adfleafright
⌚ \adfoutlineleafleft	⌚ \adfoutlineleafright
⌚ \adfsmallhangingleafleft	⌚ \adfsmallhangingleafright
⌚ \adfsmallleafleft	⌚ \adfsmallleafright
⌚ \adfsolidleafleft	⌚ \adfsolidleafright

TABLE 377: wasysym Geometric Shapes

○ \Circle	● \LEFTcircle	○ \octagon	○ \RIGHTcircle
● \CIRCLE	● \LEFTCIRCLE	○ \pentagon	● \RIGHTCIRCLE
○ \hexagon	○ \Leftcircle	○ \Rightcircle	○ \varhexagon

TABLE 378: MnSymbol Geometric Shapes

★	\filledlargestar	◊	\largeclozene	◊	\medclozene
◆	\filledlozenge	☆	\largepentagram	◊	\medstarofdavid
◆	\filledmedclozene	□	\largesquare	◊	\smallclozene
○	\largecircle	☆	\largestar		
◇	\largediamond	◊	\largestarofdavid		

MnSymbol defines \bigcirc as a synonym for \largecircle; \bigstar as a synonym for \filledlargestar; \lozene as a synonym for \medclozene; and, \blackclozene as a synonym for \filledmedclozene.

TABLE 379: fdsymbol Geometric Shapes

●	\largeblackcircle	▽	\largeangledown	◊	\medclozene
■	\largeblacksquare	△	\largeangleup	◆	\smallblackclozene
★	\largeblackstar	☆	\largewhitestar	◊	\smallclozene
○	\largecircle	◊	\lozengeminus	◊	\starofdavid
□	\lagesquare	◆	\medblackclozene		

fdsymbol defines synonyms for almost all of the preceding symbols:

○	\bigcirc	■	\lgblksquare	◊	\mdlgwhtclozene
★	\bigstar	○	\lgwhtcircle	◊	\mdwhtclozene
▽	\bigangledown	□	\lgwhtsquare	◆	\smbblkclozene
△	\bigangleup	◊	\lozenge	◊	\smwhtclozene
◆	\blackclozene	◆	\mdblkclozene		
●	\lgblkcircle	◆	\mdlgbblkclozene		

TABLE 380: boisik Geometric Shapes

★	\bigstar	◊	\diamond	▽	\angledown
◆	\blackclozene	◊	\lozenge	◀	\angleleft
■	\blacksquare	◊	\lozengedot	▷	\angleright
▲	\blacktriangle	□	\square	▫	\varlrttriangle
▼	\blackangledown	*	\star		

TABLE 381: stix Geometric Shapes

○	\acwopencirclearrow
↖	\barovernorthwestarrow
◎	\benznr
▼	\bigblacktriangledown
▲	\bigblacktriangleup
★	\bigstar
▽	\bigtriangledown
◀	\bigtriangleleft
△	\bigtriangleup
☆	\bigwhitestar
●	\blackcircledownarrow
●	\blackcircledrightdot
●	\blackcircledtwodots
●	\blackcircleulquadwhite
◆	\blackdiamonddownarrow
◆	\blackinwhitediamond
◻	\blackinwhitesquare
◀	\blacklefthalfcircle
◆	\blacklozenge
◀	\blackpointerleft
▶	\blackpointerright
▶	\blackrighthalfcircle
▲	\blacktriangle
▼	\blacktriangledown
◀	\blacktriangleleft
▶	\blacktriangleright
●	\blkhorzoval
●	\blkvertoval
○	\botsemicircle
⊕	\boxonbox
◎	\bullseye
○	\circ
●	\circlebottomhalfblack
●	\circledbullet
♀	\circledownarrow
○	\circledrightdot
✿	\circledstar
○	\circledtwodots
◎	\circledwhitebullet
●	\circlelefthalfblack
○	\circlellquad
○	\circlelrquad
●	\circlerighthalfblack
●	\circletophalfblack
○	\circleulquad
○	\circleurquad
●	\circleurquadblack
▼	\downtriangleleftblack
▼	\downtrianglerightblack
○	\enclosecircle
◇	\enclosediamond
□	\enclosesquare
△	\enclosetriangle
●	\errbarblackcircle
◆	\errbarblackdiamond
■	\errbarblacksquare
○	\errbarcircle
◊	\errbardiamond
□	\errbarsquare
○	\fisheye
□	\fltns
○	\hexagon
●	\hexagonblack
◊	\house
□	\hrectangle
■	\hrectangleblack
○	\inversewhitecircle
▣	\invwhitehalfcircle
▣	\invwhiteupperhalfcircle
●	\lgbkcircle
■	\lgblksquare
○	\lgwhtcircle
□	\lgwtsquare
◀	\llblacktriangle
▽	\lltriangle
◀	\lrblacktriangle
▽	\lrtriangle
●	\mdblkcircle
◆	\mdblkdiamond
◆	\mdblklozenge
■	\mdblksquare
●	\mdlgbkcircle
◆	\mdlgbldiamond
■	\mdlgbksquare
◊	\mdlgwhtdiamond
◊	\mdlgwhtlozenge
□	\mdlgwtsquare
●	\mdsmblkcircle
■	\mdsmblksquare
○	\mdsmwhtcircle
□	\mdsmwtsquare
○	\mdwhtcircle
◊	\mdwhtdiamond
◊	\mdwhtlozenge
◀	\smalltriangleleft
▶	\smalltriangleright
◆	\smbblkdiamond
◆	\smbblklozenge
■	\smbblksquare
☆	\smwhitestar
○	\smwhtcircle
◊	\smwhtdiamond
◊	\smwhtlozenge
□	\smwhtsquare
□	\sqlozenge
■	\squarebotblack
■	\squarecrossfill
■	\squarehfill
■	\squarehvfill
■	\squareleftblack
■	\squarellblack
■	\squarellquad
■	\squarelrblack
■	\squarelrquad
■	\squareneswfill
■	\squarenwsefill
■	\squarightblack
■	\squaretopblack
■	\squareulblack
■	\squareulquad
■	\squareurblack
■	\squareurquad
■	\squarevfill
○	\squaoval
○	\topsemicircle
□	\trapezium
△	\trianglecdot
▽	\triangledown
▲	\triangleleftblack
△	\triangleodot
▲	\trianglerightblack
△	\triangles
△	\triangleubar
◀	\ulblacktriangle
▽	\ultriangle
◊	\uparrowoncircle
◀	\urblacktriangle
▽	\urtriangle
○	\varhexagon
●	\varhexagonblack
○	\varhexagonrbonds

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◐	\circlevertfill	□	\mdwhtsquare	△	\varlrtriangle
○=	\cirE	★	\medblackstar	*	\varstar
○◦	\cirs cir	☆	\medwhitestar	□	\vrectangle
○○	\cwopencirclearrow	□□	\parallelogram	■	\vrectangleblack
◆	\diamondbotblack	■■	\parallelogramblack	·	\vysmblk square
◊	\diamondondot	○	\pentagon	·	\vysmwht square
◆◆	\diamondleftblack	◆	\pentagonblack	△△	\whiteinwhitetriangle
◆◆	\diamondrightblack	◇	\rightpentagon	▷	\whitepointerleft
◆◆	\diamondtopblack	◆	\rightpentagonblack	▷	\whitepointerright
○○	\dottedcircle	◀	\smallblacktriangleleft	○	\whthorzoval
□□	\dottedsquare	▶	\smallblacktriangleright	○	\whtvertoval

stix defines \diamond as a synonym for \smwhtdiamond, \blacksquare as a synonym for \mdlgbksquare, \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 \mglgwhtlozenge, \bigcirc as a synonym for \mglgwtcircle, \circ as a synonym for \smwhtcircle. and \mdlgbklozenge as a synonym for \blacklozenge.

TABLE 382: ifsym Geometric Shapes

○	\BigCircle	►	\FilledBigTriangleRight	○	\SmallCircle
×	\BigCross	▲	\FilledBigTriangleUp	×	\SmallCross
◊	\BigDiamondshape	●	\FilledCircle	◊	\SmallDiamondshape
—	\BigHBar	♦	\FilledDiamondShadowA	—	\SmallHBar
◆	\BigLowerDiamond	◆	\FilledDiamondShadowC	◆	\SmallLowerDiamond
◆	\BigRightDiamond	◆	\FilledDiamondshape	◆	\SmallRightDiamond
□	\BigSquare	●	\FilledSmallCircle	□	\SmallSquare
▽	\BigTriangleDown	◆	\FilledSmallDiamondshape	▽	\SmallTriangleDown
◀	\BigTriangleLeft	■	\FilledSmallSquare	◀	\SmallTriangleLeft
▷	\BigTriangleRight	▼	\FilledSmallTriangleDown	▷	\SmallTriangleRight
△	\BigTriangleUp	◀	\FilledSmallTriangleLeft	△	\SmallTriangleUp
	\BigVBar	▶	\FilledSmallTriangleRight		\SmallVBar
○	\Circle	▲	\FilledSmallTriangleUp	↓	\SpinDown
×	\Cross	■	\FilledSquare	↑	\SpinUp
◊	\DiamondShadowA	■	\FilledSquareShadowA	□	\Square
◊	\DiamondShadowB	■	\FilledSquareShadowC	□	\SquareShadowA
◊	\DiamondShadowC	▼	\FilledTriangleDown	■	\SquareShadowB
◊	\Diamondshape	◀	\FilledTriangleLeft	□	\SquareShadowC
●	\FilledBigCircle	▶	\FilledTriangleRight	▽	\TriangleDown

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◆ \FilledBigDiamondshape	▲ \FilledTriangleUp	◀ \TriangleLeft
■ \FilledBigSquare	— \HBar	▷ \TriangleRight
▼ \FilledBigTriangleDown	◆ \LowerDiamond	△ \TriangleUp
◀ \FilledBigTriangleLeft	◆ \RightDiamond	\VBar

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 “ \bigcircledcirc ”. Likewise, `\Square` and `\Cross` combine to give “ \boxtimes ”. See Section 10.3 for more information about constructing new symbols out of existing symbols.

TABLE 383: bbdng Geometric Shapes

○ \CircleShadow	█ \Rectangle	□ \SquareShadowTopLeft
● \CircleSolid	█ \RectangleBold	□ \SquareShadowTopRight
◆ \DiamondSolid	█ \RectangleThin	█ \SquareSolid
○ \Ellipse	□ \Square	▼ \TriangleDown
○ \EllipseShadow	□ \SquareCastShadowBottomRight	▲ \TriangleUp
● \EllipseSolid	□ \SquareCastShadowTopLeft	
◀ \HalfCircleLeft	□ \SquareCastShadowTopRight	
▶ \HalfCircleRight	□ \SquareShadowBottomRight	

TABLE 384: pifont Geometric Shapes

● \ding{108}	□ \ding{111}	□ \ding{114}	◆ \ding{117}	▀ \ding{121}
○ \ding{109}	□ \ding{112}	▲ \ding{115}	▷ \ding{119}	■ \ding{122}
■ \ding{110}	□ \ding{113}	▼ \ding{116}	\ding{120}	

TABLE 385: universa Geometric Shapes

● \baucircle	■ \lausquare	▲ \bautriangle
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TABLE 386: adfsymbols Geometric Shapes

• \adfbullet{27}	► \adfbullet{32}	• \adfbullet{43}	♦ \adfbullet{48}
• \adfbullet{28}	▲ \adfbullet{33}	• \adfbullet{44}	♦ \adfbullet{49}
■ \adfbullet{29}	▼ \adfbullet{34}	◦ \adfbullet{45}	♦ \adfbullet{50}
◆ \adfbullet{30}	• \adfbullet{41}	▪ \adfbullet{46}	◊ \adfbullet{51}
◀ \adfbullet{31}	• \adfbullet{42}	▪ \adfbullet{47}	◦ \adfbullet{52}

TABLE 387: fontawesome Geometric Shapes

●	<code>\faCircle</code>	○	<code>\faCircle0Notch</code>	◎	<code>\faDotCircle0</code>	□	<code>\faSquare0</code>
○	<code>\faCircle0</code>	○	<code>\faCircleThin</code>	■	<code>\faSquare</code>		

TABLE 388: L^AT_EX 2 _{ε} Playing-Card Suits

♣ `\clubsuit` ◊ `\diamondsuit` ♥ `\heartsuit` ♠ `\spadesuit`

TABLE 389: txfonts/pfxfonts Playing-Card Suits

♤ `\varclubsuit` ♦ `\vardiamondsuit` ♥ `\varheartsuit` ♧ `\varspadesuit`

TABLE 390: MnSymbol Playing-Card Suits

♣ `\clubsuit` ◊ `\diamondsuit` ♥ `\heartsuit` ♠ `\spadesuit`

TABLE 391: fdsymbol Playing-Card Suits

♣	<code>\clubsuit</code>	♥	<code>\heartsuit</code>	♦	<code>\vardiamondsuit</code>
◊	<code>\diamondsuit</code>	♠	<code>\spadesuit</code>	♥	<code>\varheartsuit</code>

TABLE 392: boisik Playing-Card Suits

♣ `\clubsuit` ◊ `\diamondsuit` ♥ `\heartsuit` ♠ `\spadesuit`

TABLE 393: 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 394: arev Playing-Card Suits

♤ `\varclub` ♦ `\vardiamond` ♥ `\varheart` ♧ `\varspade`

TABLE 395: adforn Flourishes

~	\adfclosedflourishleft	~	\adfclosedflourishright
~~	\adfdoubleflourishleft	~~	\adfdoubleflourishright
~~	\adfdoublesharpflourishleft	~~	\adfdoublesharpflourishright
~	\adfflourishleft	~	\adfflourishright
~~	\adfflourishleftdouble	~~	\adfflourishrightdouble
~	\adfopenflourishleft	~	\adfopenflourishright
—	\adfsharpflourishleft	—	\adfsharpflourishright
~~	\adfsickleflourishleft	~~	\adfsickleflourishright
~	\adfsingleflourishleft	~	\adfsingleflourishright
~~	\adftriplefLOURISHleft	~~	\adftriplefLOURISHright
~~	\adfwavesleft	~~	\adfwavesright

TABLE 396: Miscellaneous dingbat Dingbats

⚓	\anchor	👁	\eye	𝒮	\Sborder
↷	\carriagereturn	❖	\filledsquarewithdots	❖	\squarewithdots
✓	\checkmark	✖	\satellitedish	☒	\Zborder

TABLE 397: Miscellaneous bbdng Dingbats

✉	\Envelope	✉	\Peace	📞	\PhoneHandset	☀	\SunshineOpenCircled
❖	\OrnamentDiamondSolid	☎	\Phone	✈	\Plane	⌚	\Tape

TABLE 398: 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 399: Miscellaneous adforn Dingbats

- \adfbullet ◊ \adfdiamond ⚡ \adfgee § \adfs □ \adfsquare

6 Ancient languages

This section 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 400: phaistos Symbols from the Phaistos Disk

	\PHarrow		\PHeagle		\PHplumedHead
	\PHbee		\PHflute		\PHram
	\PHbeehive		\PHgauntlet		\PHrosette
	\PHboomerang		\PHgrater		\PHsaw
	\PHbow		\PHhelmet		\PHshield
	\PHbullLeg		\PHhide		\PHship
	\PHcaptive		\PHhorn		\PHsling
	\PHcarpentryPlane		\PHlid		\PHsmallAxe
	\PHcat		\PHlily		\PHtrainer
	\PHchild		\PHmanacles		\PHtattooedHead
	\PHclub		\PHmattock		\PHtiara
	\PHcolumn		\PHoxBack		\PHtunny
	\PHcomb		\PHpapyrus		\PHvine
	\PHdolium		\PHpedestrian		\PHwavyBand
	\PHdove		\PHplaneTree		\PHwoman

TABLE 401: protosem Proto-Semitic Characters

	\Aaleph		\AAhe		\Akaph		\Asamekh		\AAresh
	\AAaleph		\Azayin		\AAkaph		\Ape		\Ashin
	\Abeth		\Avav		\Alamed		\AApe		\Ahelmet
	\AAbeth		\Aheth		\AAlamed		\Asade		\AAhelmet
	\Agimel		\AAheth		\Amem		\AAasade		\Atav
	\Adaleth		\Ateth		\Anun		\Aqoph		
	\AAdaleth		\Ayod		\Aayin		\AAqoph		
	\Ahe		\AAyod		\AAayin		\Aresh		

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 “ ”). See the `protosem` documentation for more information.

TABLE 402: hierogl f Hieroglyphics

	\HA		\HI		\Hn		\HT
	\Ha		\Hi		\HO		\Ht
	\HB		\Hibl		\Ho		\Htongue
	\Hb		\Hibp		\Hp		\HU
	\Hc		\Hibs		\HP		\Hu
	\HC		\Hibw		\Hplural		\HV
	\HD		\HJ		\Hplus		\Hv
	\Hd		\Hj		\HQ		\Hvbar
	\Hdual		\Hk		\Hq		\Hw
	\He		\HK		\Hquery		\HW
	\HE		\HL		\HR		\HX
	\Hf		\Hl		\Rr		\Hx
	\HF		\Hm		\Ss		\HY
	\HG		\HM		\HS		\Hy
	\Hg		\Hman		\Hscribe		\Hz
	\Hh		\Hms		\Hslash		\HZ
	\HH		\HN		\Sv		
	\Hone		\Hhundred		\HXthousand		\Hmillion
	\Hten		\Hthousand		\HCthousand		

The hierogl f 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 hierogl f documentation for more information.

TABLE 403: linearA Linear A Script

	\LinearAI		\LinearAXCIX		\LinearACXCVII		\LinearACCXCV
	\LinearAII		\LinearAC		\LinearACXCVIII		\LinearACCXCVI
	\LinearAIII		\LinearACI		\LinearACXCIX		\LinearACCXCVII
	\LinearAIV		\LinearACII		\LinearACC		\LinearACCXCVIII
	\LinearAV		\LinearACIII		\LinearACCI		\LinearACCXCIX
	\LinearAVI		\LinearACIV		\LinearACCII		\LinearACCC
	\LinearAVII		\LinearACV		\LinearACIII		\LinearACCCI
	\LinearAVIII		\LinearACVI		\LinearACCIV		\LinearACCCII
	\LinearAIX		\LinearACVII		\LinearACCV		\LinearACCCIII

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ℳ \LinearAX	ℳ \LinearACVIII	ℳ \LinearACCVI	ℳ \LinearACCCIV
⊕ \LinearAXI	ℳ \LinearACIX	ℳ \LinearACCVII	ℳ \LinearACCCV
ℳ \LinearAXII	ℳ \LinearACX	ℳ \LinearACCVIII	ℳ \LinearACCCVI
ℳ \LinearAXIII	ℳ \LinearACXI	ℳ \LinearACCIX	ℳ \LinearACCCVII
ℳ \LinearAXIV	ℳ \LinearACXII	ℳ \LinearACCX	ℳ \LinearACCCVIII
ℳ \LinearAXV	ℳ \LinearACXIII	ℳ \LinearACCXI	ℳ \LinearACCCIX
ℳ \LinearAXVI	ℳ \LinearACXIV	ℳ \LinearACCXII	ℳ \LinearACCCX
ℳ \LinearAXVII	ℳ \LinearACXV	ℳ \LinearACCXIII	ℳ \LinearACCCXI
ℳ \LinearAXVIII	ℳ \LinearACXVI	ℳ \LinearACCXIV	ℳ \LinearACCCXII
ℳ \LinearAXIX	ℳ \LinearACXVII	ℳ \LinearACCXV	ℳ \LinearACCCXIII
ℳ \LinearAXX	ℳ \LinearACXVIII	ℳ \LinearACCXVI	ℳ \LinearACCCXIV
ℳ \LinearAXXI	ℳ \LinearACXIX	ℳ \LinearACCXVII	ℳ \LinearACCCXV
ℳ \LinearAXXII	ℳ \LinearACXX	ℳ \LinearACCXVIII	ℳ \LinearACCCXVI
ℳ \LinearAXXIII	ℳ \LinearACXXI	ℳ \LinearACCXIX	ℳ \LinearACCCXVII
ℳ \LinearAXXIV	ℳ \LinearACXXII	ℳ \LinearACCXX	ℳ \LinearACCCXVIII
ℳ \LinearAXXV	ℳ \LinearACXXIII	ℳ \LinearACCXI	ℳ \LinearACCCXIX
ℳ \LinearAXXVI	ℳ \LinearACXXIV	ℳ \LinearACCXII	ℳ \LinearACCCXX
ℳ \LinearAXXVII	ℳ \LinearACXXV	ℳ \LinearACCXIII	ℳ \LinearACCCXXI
ℳ \LinearAXXVIII	ℳ \LinearACXXVI	ℳ \LinearACCXIV	ℳ \LinearACCCXXII
ℳ \LinearAXXIX	ℳ \LinearACXXVII	ℳ \LinearACCXV	ℳ \LinearACCCXXIII
ℳ \LinearAXX	ℳ \LinearACXXVIII	ℳ \LinearACCXVI	ℳ \LinearACCCXXIV
ℳ \LinearAXXXI	ℳ \LinearACXXIX	ℳ \LinearACCXVII	ℳ \LinearACCCXXV
ℳ \LinearAXXXII	ℳ \LinearACXXX	ℳ \LinearACCXVIII	ℳ \LinearACCCXXVI
ℳ \LinearAXXXIII	ℳ \LinearACXXXI	ℳ \LinearACCXIX	ℳ \LinearACCCXXVII
ℳ \LinearAXXXIV	ℳ \LinearACXXXII	ℳ \LinearACXXX	ℳ \LinearACCCXXVIII
ℳ \LinearAXXXV	ℳ \LinearACXXXIII	ℳ \LinearACXXXI	ℳ \LinearACCCXXIX
ℳ \LinearAXXXVI	ℳ \LinearACXXXIV	ℳ \LinearACXXXII	ℳ \LinearACCCXXX
ℳ \LinearAXXXVII	ℳ \LinearACXXXV	ℳ \LinearACXXXIII	ℳ \LinearACCCXXXI
ℳ \LinearAXXXVIII	ℳ \LinearACXXXVI	ℳ \LinearACXXXIV	ℳ \LinearACCCXXXII
ℳ \LinearAXXXIX	ℳ \LinearACXXXVII	ℳ \LinearACXXXV	ℳ \LinearACCCXXXIII
ℳ \LinearAXL	ℳ \LinearACXXXVIII	ℳ \LinearACXXXVI	ℳ \LinearACCCXXXIV
ℳ \LinearAXLI	ℳ \LinearACXXXIX	ℳ \LinearACXXXVII	ℳ \LinearACCCXXXV
ℳ \LinearAXLII	ℳ \LinearACXL	ℳ \LinearACXXXVIII	ℳ \LinearACCCXXXVI
ℳ \LinearAXLIII	ℳ \LinearACXLI	ℳ \LinearACXXXIX	ℳ \LinearACCCXXXVII
ℳ \LinearAXLIV	ℳ \LinearACXLII	ℳ \LinearACXL	ℳ \LinearACCCXXXVIII
ℳ \LinearAXLV	ℳ \LinearACXLIII	ℳ \LinearACXLII	ℳ \LinearACCCXXXIX
ℳ \LinearAXLVI	ℳ \LinearACXLIV	ℳ \LinearACXLII	ℳ \LinearACCCXL
ℳ \LinearAXLVII	ℳ \LinearACXLV	ℳ \LinearACXLIII	ℳ \LinearACCCXL
ℳ \LinearAXLVIII	ℳ \LinearACXLVI	ℳ \LinearACXLIV	ℳ \LinearACCCXLII
ℳ \LinearAXLIX	ℳ \LinearACXLVII	ℳ \LinearACXLV	ℳ \LinearACCCXLIII
ℳ \LinearAL	ℳ \LinearACXLVIII	ℳ \LinearACXLVI	ℳ \LinearACCCXLIV
ℳ \LinearALI	ℳ \LinearACXLIX	ℳ \LinearACXLVII	ℳ \LinearACCCXLV
ℳ \LinearALII	ℳ \LinearACL	ℳ \LinearACXLVIII	ℳ \LinearACCCXLVI
ℳ \LinearALIII	ℳ \LinearACLI	ℳ \LinearACXLIX	ℳ \LinearACCCXLVII
ℳ \LinearALIV	ℳ \LinearACLII	ℳ \LinearACCL	ℳ \LinearACCCXLVIII
ℳ \LinearALV	ℳ \LinearACLIII	ℳ \LinearACCLI	ℳ \LinearACCCXLIX
ℳ \LinearALVI	ℳ \LinearACLIV	ℳ \LinearACCLI	ℳ \LinearACCCCL
ℳ \LinearALVII	ℳ \LinearACLV	ℳ \LinearACCLII	ℳ \LinearACCLI
ℳ \LinearALVIII	ℳ \LinearACLVI	ℳ \LinearACCLIII	ℳ \LinearACCLII

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፩	\LinearALIX	፪	\LinearACLVII	፫	\LinearACCLV	፬	\LinearACCIII
፪	\LinearALX	፫	\LinearACLVIII	፬	\LinearACCLVI	፭	\LinearACCIV
፫	\LinearALXI	፯	\LinearACLIX	፭	\LinearACCLVII	፮	\LinearACCIV
፬	\LinearALXII	፯	\LinearACLX	፯	\LinearACCLVIII	፯	\LinearACCIV
፭	\LinearALXIII	፯	\LinearACLXI	፯	\LinearACCLIX	፯	\LinearACCIV
፮	\LinearALXIV	፯	\LinearACLXII	፯	\LinearACCLX	፯	\LinearACCIV
፯	\LinearALXV	፯	\LinearACLXIII	፯	\LinearACCLXI	፯	\LinearACCIV
፰	\LinearALXVI	፯	\LinearACLXIV	፯	\LinearACCLXII	፯	\LinearACCIV
፱	\LinearALXVII	፯	\LinearACLXV	፯	\LinearACCLXIII	፯	\LinearACCIV
፲	\LinearALXVIII	፯	\LinearACLXVI	፯	\LinearACCLXIV	፯	\LinearACCIV
፳	\LinearALXIX	፯	\LinearACLXVII	፯	\LinearACCLXV	፯	\LinearACCIV
፴	\LinearALXX	፯	\LinearACLXVIII	፯	\LinearACCLXVI	፯	\LinearACCIV
፵	\LinearALXXI	፯	\LinearACLXIX	፯	\LinearACCLXVII	፯	\LinearACCIV
፶	\LinearALXXII	፯	\LinearACLXX	፯	\LinearACCLXVIII	፯	\LinearACCIV
፷	\LinearALXXIII	፯	\LinearACLXXI	፯	\LinearACCLXIX	፯	\LinearACCIV
፸	\LinearALXXIV	፯	\LinearACLXXII	፯	\LinearACCLXX	፯	\LinearACCIV
፹	\LinearALXXV	፯	\LinearACLXXIII	፯	\LinearACCLXXI	፯	\LinearACCIV
፺	\LinearALXXVI	፯	\LinearACLXXIV	፯	\LinearACCLXXII	፯	\LinearACCIV
፻	\LinearALXXVII	፯	\LinearACLXXV	፯	\LinearACCLXXIII	፯	\LinearACCIV
፼	\LinearALXXVIII	፯	\LinearACLXXVI	፯	\LinearACCLXXIV	፯	\LinearACCIV
፽	\LinearALXXIX	፯	\LinearACLXXVII	፯	\LinearACCLXXV	፯	\LinearACCIV
፾	\LinearALXXX	፯	\LinearACLXXVIII	፯	\LinearACCLXXVI	፯	\LinearACCIV
፷	\LinearALXXXI	፯	\LinearACLXXIX	፯	\LinearACCLXXVII	፯	\LinearACCIV
፸	\LinearALXXXII	፯	\LinearACLXXX	፯	\LinearACCLXXVIII	፯	\LinearACCIV
፹	\LinearALXXXIII	፯	\LinearACLXXXI	፯	\LinearACCLXXIX	፯	\LinearACCIV
፺	\LinearALXXXIV	፯	\LinearACLXXXII	፯	\LinearACCLXXX	፯	\LinearACCIV
፻	\LinearALXXXV	፯	\LinearACLXXXIII	፯	\LinearACCLXXXI	፯	\LinearACCIV
፼	\LinearALXXXVI	፯	\LinearACLXXXIV	፯	\LinearACCLXXXII	፯	\LinearACCIV
፽	\LinearALXXXVII	፯	\LinearACLXXXV	፯	\LinearACCLXXXIII	፯	\LinearACCIV
፶	\LinearALXXXVIII	፯	\LinearACLXXXVI	፯	\LinearACCLXXXIV	፯	\LinearACCIV
፷	\LinearALXXXIX	፯	\LinearACLXXXVII	፯	\LinearACCLXXXV	፯	\LinearACCIV
፸	\LinearALXXXX	፯	\LinearACLXXXVIII	፯	\LinearACCLXXXVI	፯	\LinearACCIV
፹	\LinearAXCI	፯	\LinearACLXXXIX	፯	\LinearACCLXXXVII	፯	\LinearACCIV
፺	\LinearAXCII	፯	\LinearACLXXXX	፯	\LinearACCLXXXVIII	፯	\LinearACCIV
፻	\LinearAXCIII	፯	\LinearACXCI	፯	\LinearACCLXXXIX	፯	\LinearACCIV
፼	\LinearAXCIV	፯	\LinearACXCII	፯	\LinearACCLXXX	፯	\LinearACCIV
፽	\LinearAXCV	፯	\LinearACXCIII	፯	\LinearACXCII	፯	\LinearACCIV
፾	\LinearAXCVI	፯	\LinearACXCIV	፯	\LinearACXCII	፯	\LinearACCIV
፷	\LinearAXCVII	፯	\LinearACXCV	፯	\LinearACXCIII	፯	\LinearACCIV
፸	\LinearAXCVIII	፯	\LinearACXCVI	፯	\LinearACXCIV	፯	\LinearACCIV

TABLE 404: linearb Linear B Basic and Optional Letters

\Ba	\Bja	\Bmu	\Bpte	\Broii	\Bto
\Baii	\Bje	\Bna	\Bpu	\Bru	\Btu
\Baiii	\Bjo	\Bne	\Bpuii	\Bsa	\Btwo
\Bau	\Bju	\Bni	\Bqa	\Bse	\Bu
\Bda	\Bka	\Bno	\Bqe	\Bsi	\Bwa
\Bde	\Bke	\Bnu	\Bqi	\Bso	\Bwe
\Bdi	\Bki	\Bnwa	\Bqo	\Bsu	\Bwi
\Bdo	\Bko	\Bo	\Bra	\Bswa	\Bwo
\Bdu	\Bku	\Bpa	\Braii	\Bswi	\Bza
\Bdwe	\Bma	\Bpiaii	\Braiii	\Bta	\Bze
\Bdwo	\Bme	\Bpe	\Bre	\Btaii	\Bzo
\Be	\Bmi	\Bpi	\Bri	\Bte	
\Bi	\Bmo	\Bpo	\Bro	\Bti	

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 “`#\V\Y`”, for example. See the `linearb` documentation for more information.

TABLE 405: linearb Linear B Numerals

I	\BNi		\BNvii	==	\BNxl	○	\Bnc	○○○○	\Bndcc
II	\BNii		\BNviii	==	\BNl	○	\BNcc	○○○○	\Bndccc
III	\BNiii		\BNix	==	\BNlx	○○	\BNccc	○○○○○	\BNcm
II	\BNiv	-	\BNx	==	\BNlxx	○○	\BNcd	-○-	\BNm
II	\BNv	=	\BNxx	==	\BNlxxx	○○○	\Bnd		
III	\BNvi	=	\BNxxx	==	\BNxc	○○○	\Bndc		

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope.

TABLE 406: linearb Linear B Weights and Measures

\Btalent	\BPtalent	↑	\BPvolb	↑	\BPvolcf	♂	\BPwtb	♀	\BPwtd
\Bvola	\BPvola	†	\BPvolcd	†	\BPwta	‡	\BPwtc		

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope.

TABLE 407: linearb Linear B Ideograms

\BPamphora	\BPchassis	\BPman	\BPwheat
\BParrow	\BPcloth	\BPnanny	\BPwheel
\BPbarley	\BPCow	\BPolive	\BPwine
\BPbilly	\BPCup	\BPOx	\BPwineiih
\BPboar	\BPeWe	\BPPig	\BPwineiiih
\BPbronze	\BPfoal	\BPram	\BPwineivh
\BPbull	\BPgoat	\BPsheep	\BPwoman
\BPcauldroni	\BPGoblet	\BPsow	\BPwool
\BPcauldronii	\BPGold	\BPspear	
\BPchariot	\BPhorse	\BPsword	

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope.

TABLE 408: linearb Unidentified Linear B Symbols

❀ \BUi	❖ \BUiv	❖ \BUvii	❖ \BUx	❖ \Btwe
❖ \BUii	❖ \BUv	❖ \BUviii	❖ \BUxi	
❖ \BUiii	❖ \BUvi	❖ \BUix	❖ \BUxii	

These symbols must appear either within the argument to `\textlinb` or following the `\linbfamily` font-selection command within a scope.

TABLE 409: 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	F	\Cto	⤻	\Cyo
⤻	\Cka	⤻	\Cma	⤻	\Co	⤻	\Cru	F	\Ctu	⤻	\Cza
⤻	\Cke	⤻	\Cme	⤻	\Cpa	⤻	\Csa	⤻	\Cu	⤻	\Czo
⤻	\Cki	⤻	\Cmi	⤻	\Cpe	⤻	\Cse	⤻	\Cwa	⤻	
⤻	\Cko	⤻	\Cmo	⤻	\Cpi	⤻	\Csi	I	\Cwe	⤻	

TABLE 410: *sarabian* South Arabian Letters

◦	\SAa	☒	\SAz	☒	\SAM	☒	\SAsd	☒	\SAdb
□	\SAb	Ψ	\SAhd	□	\SAN	◊	\SAq	☒	\SATb
□	\SAg	□□	\SATd	☒	\SAs	○	\SAr	□	\SAGa
՚	\SAd	՚	\SAY	◊	\SAf	՚	\SAsv	՚	\SAzd
՚	\SAh	՚	\SAK	՚	\SAlq	X	\SAT	՚	\SAsa
՞	\SAw	՚	\SAl	՚	\SAo	՞	\SAhu	՞	\SAdd

These symbols must appear either within the argument to `\texttsarab` or following the `\sarabfamily` font-selection command within a scope. Single-character shortcuts are also supported: Both “`\texttsarab{\SAb\SAk\SAn}`” and “`\texttsarab{bkn}`” produce “□՚□”, for example. See the *sarabian* documentation for more information.

TABLE 411: *teubner* Archaic Greek Letters and Greek Numerals

Ϙ	\Coppa [†]	F	\Digamma*	ϙ	\sampi*	ϙ	\varstigma
ϙ	\coppa [†]	ϙ	\koppa*	Ϙ	\Stigma		
ϙ	\digamma*,‡	ϙ	\Sampi	ϙ	\stigma*		

* 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`.

† For compatibility with other naming conventions *teubner* defines `\Koppa` as a synonym for `\Coppa` and `\varcoppa` as a synonym for `\coppa`.

‡ If both *teubner* and *amssymb* are loaded, *teubner*'s `\digamma` replaces *amssymb*'s `\digamma`, regardless of package-loading order.

TABLE 412: *boisik* Archaic Greek Letters and Greek Numerals

F	\Digamma	ϙ	\qoppa	ϙ	\stigma	ϙ	\varsampi
F	\digamma	Ϙ	\Qoppa	Ϙ	\Stigma		
ϙ	\heta	ϙ	\Sampi	ϙ	\vardigamma		
ϙ	\Heta	ϙ	\sampi	ϙ	\Varsampi		

TABLE 413: epiolmec Epi-Olmec Script

	\EOafter		\EOMiddle		\EOStarWarrior
	\EOandThen		\EOmonster		\EOstep
	\EOAppear		\EOMountain		\EOSu
	\EOBeardMask		\EOmuu		\EOsu
	\EOBedeck		\EOna		\EOSun
	\EOblood		\EOOne		\EOSuu
	\EObrace		\EOni		\EOSuu
	\EObuilding		\EOnow		\Eota
	\EObundle		\EOnu		\Eote
	\EOchop		\EOnuu		\EOthrone
	\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		\EOpenis		\Eotukpa
	\EOgovernor		\EOpi		\Eoturtle
	\EOguise		\EOPierce		\Eotuu
	\EOhallow		\EOPlant		\Eotza
	\EOja		\EOPlay		\Eotze
	\EOjaguar		\EOpo		\Eotzetz
	\EOje		\EOpriest		\Eotzi
	\EOji		\EOPrince		\Eotzu
	\EOJI		\EOpu		\Eotzuu

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	\EOjo		\EOpuu		\EOundef
	\EOju		\EOpuuk		\EOvarBeardMask
	\EOkak		\EORain		\EOvarja
	\EOke		\EOSa		\EOvarji
	\EOki		\EOsa		\EOvarki
	\EOkij		\EOSacrifice		\EOvarkuu
	\EOKing		\EOSaw		\EOvarni
	\EOknottedCloth		\EOScorpius		\EOvarpa
	\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 414: 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 415: `allrunes` Runes

þ	\a	Þ	E	ɸ	\ING	ᛘ	m	ȝ	R	ȝ	\sthree
*	\A	ȝ	F	ȝ	\ing	ȝ	n	ȝ	\RR	ȝ	T
ȝ	a	ȝ	f	ȝ	\Ing	ȝ	\NG	ȝ	\s	ȝ	t
ȝ	A	X	g	ȝ	\j	ȝ	\ng	ȝ	s	ȝ	\textsection
ȝ	b	H	ȝ	ȝ	j	ȝ	o	ȝ	S	ȝ	\th
ȝ	B	N	H	ȝ	J	ȝ	\p	ȝ	\seight	ȝ	U
ȝ	\d	H	h	ȝ	\k	ȝ	p	ȝ	\sfive	ȝ	u
ȝ	D	ȝ	\i	ȝ	\K	ȝ	P	ȝ	\sfour	ȝ	w
ȝ	d	I	i	ȝ	k	ȝ	\R	ȝ	\seven		
ȝ	e	ȝ	I	ȝ	l	ȝ	r	ȝ	\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 416: `allrunes` Rune Separators

'	\bar	:	\doubleeye	+	\plus	:	\tripledot
*	\cross	‡	\doubleplus	⋮	\quaddot	⋮	\tripleeye
.	\dot	‡	\doublestar	♂	\quadeye	‡	\tripleplus
'	\doublebar	·	\eye	*	\star		
*	\doublecross	⋮	\pentdot	⋮	\triplebar		
:	\doubledot	+	\penteye	⋮⋮	\triplecross		

See the usage comment under Table 415.

7 Musical symbols

The following symbols are used to typeset musical notation. The *lilyglyphs* package provides a large subset of the symbols in this section. Note, however, that *lilyglyphs* depends upon the *fontspec* package, OpenType (.otf) fonts, and some PDF graphics and therefore works only with Lua^LAT_EX or X_EAT_EX.

TABLE 417: L^AT_EX 2_E Musical Symbols

\flat \flat \natural \natural \sharp \sharp

TABLE 418: *textcomp* Musical Symbols

\blacklozenge \textmusicalnote

TABLE 419: *wasy sym* Musical Symbols

\blacklozenge \eighthnote \blacktriangleleft \halfnote \blacktriangleright \two notes \circ \fullnote \downarrow \quarternote

TABLE 420: *MnSymbol* Musical Symbols

\flat \flat \natural \natural \sharp \sharp

TABLE 421: *fdsymbol* Musical Symbols

\flat \flat \natural \natural \sharp \sharp

TABLE 422: *boisik* Musical Symbols

\flat \flat \natural \natural \sharp \sharp

TABLE 423: *stix* Musical Symbols

\blacklozenge	\eighthnote	\blacktriangleleft	\natural	\blacktriangleright	\sharp	\sharp
\flat	\flat	\blacktriangleleft	\quarternote	\blacktriangleright	\two notes	

TABLE 424: *arev* Musical Symbols

\blacklozenge	\quarternote	\blacklozenge	\eighthnote	$\blacklozenge\!\!\!$	\sixteenthnote
-----------------	--------------	-----------------	-------------	-----------------------	----------------

TABLE 425: MusiXTEX Musical Symbols

	\allabreve	>	\lsf		\shake
	\altoclef	v	\lsfz		\Shake
	\backturn	=	\maxima		\Shakel
	\bassclef	+	\meterplus		\Shakene
/	\caesura	*~	\mordent		\Shakenw
	\coda	*~	\Mordent		\Shakesw
	\Coda		\PAUSE		\smallaltoclef
*	\Dep	-	\PAuse		\smallbassclef
[\doublethumb	-	\pause		\smalltrebleclef
[\downbow	Ped.	\Ped		\sPed
γ	\ds	{	\qp		\trebleclef
٪	\duevolte	:	\qqs	~	\trill
߻	\fermatadown	:	\qs	∞	\turn
߻	\fermataup	∅	\reverseallabreve	∨	\upbow
○	\flageolett	CJ	\reverseC	>	\usf
-	\hpause	*	\sDep	^	\usfz
߻	\hs		\Segno	∞	\wq
[\longa		\segno	∞∞	\wqq

All of these symbols are intended to be used in the context of typesetting musical scores. See the MusiXTEX documentation for more information.

TABLE 426: MusiXTEX Alternative Clefs

	\drumclef		\gregorianFclef
	\gregorianCclef		\oldGclef

In addition to MusiXTEX, \drumclef requires the `musixper` package; \oldGclef requires the `musixlit` package; and both \gregorianCclef and \gregorianFclef require the `musixgre` package. Together with MusiXTEX, 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 MusiXTEX documentation for more information.

TABLE 427: harmony Musical Symbols

	\AAcht		\DDohne		\Halb		\SechBR	>	\VM
	\Acht		\Dohne		\HaPa		\SechBr		\Zwdr
	\AchtBL		\Ds		\Pu		\SePa		\ZwPa
	\AchtBR		\DS		\Sech		<	\UB	
	\AcPa		\Ganz		\SechBL		\Vier		
	\DD		\GaPa		\SechBL		\ViPa		

The MusiXTEX package must be installed to use `harmony`.

TABLE 428: harmony Musical Accents

	\Ferli{A}\Ferli{a}*		\Ohne{A}\Ohne{a}*
	\Fermi{A}\Fermi{a}		\Umd{A}\Umd{a}*
	\Kr{A}\Kr{a}		

* 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 “”. 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 “”. As two special cases, “\Takt{c}{0}” produces “C” and “\Takt{c}{1}” produces “C”.

The MusiXTEX package must be installed to use `harmony`.

TABLE 429: *lilyglyphs* Single Notes

	\eighthNote		\quarterNoteDottedDown
	\eighthNoteDotted		\quarterNoteDown
	\eighthNoteDottedDouble		\sixteenthNote
	\eighthNoteDottedDoubleDown		\sixteenthNoteDotted
	\eighthNoteDottedDown		\sixteenthNoteDottedDouble
	\eighthNoteDown		\sixteenthNoteDottedDoubleDown
	\halfNote		\sixteenthNoteDottedDown
	\halfNoteDotted		\sixteenthNoteDown
	\halfNoteDottedDouble		\thirtysecondNote
	\halfNoteDottedDoubleDown		\thirtysecondNoteDotted
	\halfNoteDottedDown		\thirtysecondNoteDottedDouble
	\halfNoteDown		\thirtysecondNoteDottedDoubleDown
	\quarterNote		\thirtysecondNoteDottedDown
	\quarterNoteDotted		\thirtysecondNoteDown
	\quarterNoteDottedDouble		\wholeNote
	\quarterNoteDottedDoubleDown		\wholeNoteDotted

lilyglyphs defines synonyms for all of the preceding symbols:

	\crotchet		\minimDottedDown
	\crotchetDotted		\minimDown
	\crotchetDottedDouble		\quaver
	\crotchetDottedDoubleDown		\quaverDotted
	\crotchetDottedDown		\quaverDottedDouble
	\crotchetDown		\quaverDottedDoubleDown
	\demisemiquaver		\quaverDottedDown
	\demisemiquaverDotted		\quaverDown
	\demisemiquaverDottedDouble		\semibreve
	\demisemiquaverDottedDoubleDown		\semibreveDotted
	\demisemiquaverDottedDown		\semiquaver
	\demisemiquaverDown		\semiquaverDotted
	\minim		\semiquaverDottedDouble
	\minimDotted		\semiquaverDottedDoubleDown
	\minimDottedDouble		\semiquaverDottedDown
	\minimDottedDoubleDown		\semiquaverDown

TABLE 430: *lilyglyphs* Beamed Notes

	\twoBeamedQuavers		\threeBeamedQuaversII
	\threeBeamedQuavers		\threeBeamedQuaversIII
	\threeBeamedQuaversI		

TABLE 431: *lilyglyphs* Clefs

	\clefC		\clefF		\clefG
--	--------	--	--------	--	--------

Each of these symbols provides a smaller, “inline” form (`\clefCInline`, `\clefFInline`, and `\clefGInline`, respectively) intended for use within a paragraph. See the *lilyglyphs* documentation for more information.

TABLE 432: *lilyglyphs* Time Signatures

	\lilyTimeC		\lilyTimeCHalf
--	------------	--	----------------

lilyglyphs also provides a `\lilyTimeSignature` command that lets a user typeset single and compound time signatures by specifying a numerator and a denominator. See the *lilyglyphs* documentation for more information.

TABLE 433: *lilyglyphs* Accidentals

* \doublesharp	# \sharpArrowdown
b \flat	# \sharpArrowup
bb \flatflat	# \sharpSlashslashslashstem
n \natural	# \sharpSlashslashslashslashstem
# \sharp	# \sharpSlashslashstem
# \sharpArrowboth	# \sharpSlashslashstem

TABLE 434: *lilyglyphs* Rests

♪	<code>\crotchetRest</code>	♩	<code>\quaverRestDotted</code>
♪.	<code>\crotchetRestDotted</code>	♩.	<code>\semiquaverRest</code>
—	<code>\halfNoteRest</code>	—.	<code>\semiquaverRestDotted</code>
—.	<code>\halfNoteRestDotted</code>	—	<code>\wholeNoteRest</code>
˘	<code>\quaverRest</code>	˘.	<code>\wholeNoteRestDotted</code>

Multiply dotted rests can be produced with the `\lilyPrintMoreDots` command.
See the *lilyglyphs* documentation for more information.

TABLE 435: *lilyglyphs* Dynamics Letters

f	<code>\lilyDynamics{f}</code>	r	<code>\lilyDynamics{r}</code>
p	<code>\lilyDynamics{p}</code>	s	<code>\lilyDynamics{s}</code>
m	<code>\lilyDynamics{m}</code>	z	<code>\lilyDynamics{z}</code>
rf	<code>\lilyRF</code>	rfz	<code>\lilyRFZ</code>

These letters and the digits 0–9 are the only alphanumerics defined by *lilyglyphs*'s underlying Emmentaler fonts.

TABLE 436: *lilyglyphs* Dynamics Symbols

$<=$ `\crescHairpin` $>=$ `\decrescHairpin`

TABLE 437: *lilyglyphs* Articulations

$>$	<code>\lilyAccent</code>	\wedge	<code>\marcato</code>	$,$	<code>\staccatissimo</code>
$<=$	<code>\lilyEspressivo</code>	\vee	<code>\marcatoDown</code>	$-$	<code>\tenuto</code>
$.$	<code>\lilyStaccato</code>	$\dot{-}$	<code>\portato</code>		
\circ	<code>\lilyThumb</code>	$\dot{-}$	<code>\portatoDown</code>		

TABLE 438: *lilyglyphs* Scripts

♪ `\fermata`

TABLE 439: *lilyglyphs* Accordion Notation

\blacksquare	<code>\accordionBayanBass</code>	\circledast	<code>\accordionOldEE</code>	$\bigcirc\!\!\! \bigcirc$	<code>\accordionStdBass</code>
$\bigcirc\!\!\! \bigcirc$	<code>\accordionDiscant</code>	\triangleright	<code>\accordionPull</code>		
\ominus	<code>\accordionFreeBass</code>	\triangleright	<code>\accordionPush</code>		

TABLE 440: *lily*  **Named Time Signatures**

\lilyGlyph{timesig.C22}	\lilyGlyph{timesig.mensural198}
\lilyGlyph{timesig.C44}	\lilyGlyph{timesig.neomensural22}
\lilyGlyph{timesig.mensural122}	\lilyGlyph{timesig.neomensural24}
\lilyGlyph{timesig.mensural24}	\lilyGlyph{timesig.neomensural32}
\lilyGlyph{timesig.mensural32}	\lilyGlyph{timesig.neomensural34}
\lilyGlyph{timesig.mensural34}	\lilyGlyph{timesig.neomensural44}
\lilyGlyph{timesig.mensural44}	\lilyGlyph{timesig.neomensural48}
\lilyGlyph{timesig.mensural48}	\lilyGlyph{timesig.neomensural64}
\lilyGlyph{timesig.mensural64}	\lilyGlyph{timesig.neomensural68}
\lilyGlyph{timesig.mensural68}	\lilyGlyph{timesig.neomensural68alt}
\lilyGlyph{timesig.mensural68alt}	\lilyGlyph{timesig.neomensural94}
\lilyGlyph{timesig.mensural94}	\lilyGlyph{timesig.neomensural98}

`lilyglyps` defines shorter names for a few of these symbols. See Table 432.

TABLE 441: *lily* **lys** Named Scripts

\lilyGlyph{scripts.arpeggio}
\lilyGlyph{scripts.arpeggio.arrow.1}
\lilyGlyph{scripts.arpeggio.arrow.M1}
\lilyGlyph{scripts.augmentum}

` \lilyGlyph{scripts.barline.kievan}
// \lilyGlyph{scripts.caesura.curved}
// \lilyGlyph{scripts.caesura.straight}
\lilyGlyph{scripts.circulus}
◊ \lilyGlyph{scripts.coda}
\lilyGlyph{scripts.daccentus}
⌚ \lilyGlyph{scripts.dfermata}
⌚ \lilyGlyph{scripts.dlongfermata}
▼ \lilyGlyph{scripts.dmarcato}
□ \lilyGlyph{scripts.downbow}
~~ \lilyGlyph{scripts.downmordent}
~~ \lilyGlyph{scripts.downprall}
○ \lilyGlyph{scripts.dpedalheel}
^ \lilyGlyph{scripts.dpedaltoe}
- \lilyGlyph{scripts.dportato}
\lilyGlyph{scripts.dsemicirculus}
▽ \lilyGlyph{scripts.dshortfermata}
⌚ \lilyGlyph{scripts.dsignumcongruentiae}
⌚ \lilyGlyph{scripts.dstaccatissimo}
⌚ \lilyGlyph{scripts.dverylongfermata}
<> \lilyGlyph{scripts.espr}

~~ \lilyGlyph{scripts.prallmordent}
~~ \lilyGlyph{scripts.prallprall}
~~ \lilyGlyph{scripts.prallup}
, \lilyGlyph{scripts.rcomma}

∞ \lilyGlyph{scripts.reverseturn}
/ \lilyGlyph{scripts.rvarcomma}
‰ \lilyGlyph{scripts.segno}
> \lilyGlyph{scripts.sforzato}
◊ \lilyGlyph{scripts.snappizzicato}
. \lilyGlyph{scripts.staccato}
+ \lilyGlyph{scripts.stopped}
- \lilyGlyph{scripts.tenuto}
◊ \lilyGlyph{scripts.thumb}
✓ \lilyGlyph{scripts.tickmark}
• \lilyGlyph{scripts.trilelement}
♪ \lilyGlyph{scripts.trill}
~ \lilyGlyph{scripts.trill_element}
∞ \lilyGlyph{scripts.turn}
. \lilyGlyph{scripts.uaccentus}
⌚ \lilyGlyph{scripts.ufermata}
□ \lilyGlyph{scripts.ulongfermata}
^ \lilyGlyph{scripts.umarcato}
∨ \lilyGlyph{scripts.upbow}
◊ \lilyGlyph{scripts.upedalheel}
∨ \lilyGlyph{scripts.upedaltoe}

(continued on next page)

(continued from previous page)

◦ \lilyGlyph{scripts.flageolet}	↖ \lilyGlyph{scripts.upmordent}
◊ \lilyGlyph{scripts.halfopen}	↙ \lilyGlyph{scripts.uportato}
◊ \lilyGlyph{scripts.halfopenvertical}	⤸ \lilyGlyph{scripts.upprall}
⠄ \lilyGlyph{scripts.ictus}	⤹ \lilyGlyph{scripts.usemicirculus}
⠄ \lilyGlyph{scripts.lcomma}	⤻ \lilyGlyph{scripts.ushortfermata}
⤸ \lilyGlyph{scripts.lineprall}	⤻ \lilyGlyph{scripts.usignumcongruentiae}
⤸ \lilyGlyph{scripts.lvarcomma}	⤻ \lilyGlyph{scripts.ustaccatissimo}
⤸ \lilyGlyph{scripts.mordent}	⤸ \lilyGlyph{scripts.uverylongfermata}
◦ \lilyGlyph{scripts.open}	⤸ \lilyGlyph{scripts.varcoda}
⤸ \lilyGlyph{scripts.prall}	⤸ \lilyGlyph{scripts.varsegno}
⤸ \lilyGlyph{scripts.pralldown}	

lilyglypbs defines \fermata as a shorter name for “♪” than \lilyGlyph{scripts.ufermata}. See Table 438.

TABLE 442: *lilyglypbs* Named Rests

- \lilyGlyph{rests.0}	· \lilyGlyph{rests.4mensural}
- \lilyGlyph{rests.0mensural}	· \lilyGlyph{rests.4neomensural}
- \lilyGlyph{rests.0neomensural}	· \lilyGlyph{rests.5}
- \lilyGlyph{rests.0o}	· \lilyGlyph{rests.6}
- \lilyGlyph{rests.1}	· \lilyGlyph{rests.7}
- \lilyGlyph{rests.1mensural}	· \lilyGlyph{rests.M1}
- \lilyGlyph{rests.1neomensural}	· \lilyGlyph{rests.M1mensural}
- \lilyGlyph{rests.1o}	· \lilyGlyph{rests.M1neomensural}
⤸ \lilyGlyph{rests.2}	⤸ \lilyGlyph{rests.M1o}
⤸ \lilyGlyph{rests.2classical}	⤸ \lilyGlyph{rests.M2}
⤸ \lilyGlyph{rests.2mensural}	⤸ \lilyGlyph{rests.M2mensural}
⤸ \lilyGlyph{rests.2neomensural}	⤸ \lilyGlyph{rests.M2neomensural}
⤸ \lilyGlyph{rests.3}	⤸ \lilyGlyph{rests.M3}
⤸ \lilyGlyph{rests.3mensural}	⤸ \lilyGlyph{rests.M3mensural}
⤸ \lilyGlyph{rests.3neomensural}	⤸ \lilyGlyph{rests.M3neomensural}
⤸ \lilyGlyph{rests.4}	

lilyglypbs defines shorter names for a few of these symbols. See Table 434.

TABLE 443: *lilyglypbs* Named Pedals

* \lilyGlyph{pedal.*}	- \lilyGlyph{pedal.M}
. \lilyGlyph{pedal..}	⤸ \lilyGlyph{pedal.P}
⤸ \lilyGlyph{pedal.d}	⤸ \lilyGlyph{pedal.Ped}
⤸ \lilyGlyph{pedal.e}	

TABLE 444: *lilyglyphs* Named Flags

/ \lilyGlyph{flags.d3}) \lilyGlyph{flags.mensuralu03}
/ \lilyGlyph{flags.d4}) \lilyGlyph{flags.mensuralu04}
/ \lilyGlyph{flags.d5}) \lilyGlyph{flags.mensuralu05}
/ \lilyGlyph{flags.d6}) \lilyGlyph{flags.mensuralu06}
/ \lilyGlyph{flags.d7}) \lilyGlyph{flags.mensuralu13}
\ \lilyGlyph{flags.dgrace}) \lilyGlyph{flags.mensuralu14}
{ \lilyGlyph{flags.mensurald03}) \lilyGlyph{flags.mensuralu15}
{ \lilyGlyph{flags.mensurald04}) \lilyGlyph{flags.mensuralu16}
{ \lilyGlyph{flags.mensurald05}) \lilyGlyph{flags.mensuralu23}
{ \lilyGlyph{flags.mensurald06}) \lilyGlyph{flags.mensuralu24}
{ \lilyGlyph{flags.mensurald13}) \lilyGlyph{flags.mensuralu25}
{ \lilyGlyph{flags.mensurald14}) \lilyGlyph{flags.mensuralu26}
{ \lilyGlyph{flags.mensurald15}) \lilyGlyph{flags.u3}
{ \lilyGlyph{flags.mensurald16}) \lilyGlyph{flags.u4}
{ \lilyGlyph{flags.mensurald23}) \lilyGlyph{flags.u5}
{ \lilyGlyph{flags.mensurald24}) \lilyGlyph{flags.u6}
{ \lilyGlyph{flags.mensurald25}) \lilyGlyph{flags.u7}
{ \lilyGlyph{flags.mensurald26}) \lilyGlyph{flags.ugrace}

TABLE 445: *lilyglyphs* Named Custodes

^ \lilyGlyph{custodes.hufnagel.d0}	" \lilyGlyph{custodes.mensural.d0}
^ \lilyGlyph{custodes.hufnagel.d1}	" \lilyGlyph{custodes.mensural.d1}
^ \lilyGlyph{custodes.hufnagel.d2}	" \lilyGlyph{custodes.mensural.d2}
✓ \lilyGlyph{custodes.hufnagel.u0}	" \lilyGlyph{custodes.mensural.u0}
✓ \lilyGlyph{custodes.hufnagel.u1}	" \lilyGlyph{custodes.mensural.u1}
✓ \lilyGlyph{custodes.hufnagel.u2}	" \lilyGlyph{custodes.mensural.u2}
\lilyGlyph{custodes.medicaea.d0}	\lilyGlyph{custodes.vaticana.d0}
\lilyGlyph{custodes.medicaea.d1}	\lilyGlyph{custodes.vaticana.d1}
\lilyGlyph{custodes.medicaea.d2}	\lilyGlyph{custodes.vaticana.d2}
\lilyGlyph{custodes.medicaea.u0}	\lilyGlyph{custodes.vaticana.u0}
\lilyGlyph{custodes.medicaea.u1}	\lilyGlyph{custodes.vaticana.u1}
\lilyGlyph{custodes.medicaea.u2}	\lilyGlyph{custodes.vaticana.u2}

TABLE 446: *lilyGlyphs* Named Clefs

	\lilyGlyph{clefs.blackmensural.c}		\lilyGlyph{clefs.mensural.g_change}
	\lilyGlyph{clefs.blackmensural.c_change}		\lilyGlyph{clefs.neomensural.c}
	\lilyGlyph{clefs.C}		\lilyGlyph{clefs.neomensural.c_change}
	\lilyGlyph{clefs.C_change}		\lilyGlyph{clefs.percussion}
	\lilyGlyph{clefs.F}		\lilyGlyph{clefs.percussion_change}
	\lilyGlyph{clefs.F_change}		\lilyGlyph{clefs.petrucci.c1}
	\lilyGlyph{clefs.G}		\lilyGlyph{clefs.petrucci.c1_change}
	\lilyGlyph{clefs.G_change}		\lilyGlyph{clefs.petrucci.c2}
	\lilyGlyph{clefs.hufnagel.do}		\lilyGlyph{clefs.petrucci.c2_change}
	\lilyGlyph{clefs.hufnagel.do.fa}		\lilyGlyph{clefs.petrucci.c3}
	\lilyGlyph{clefs.hufnagel.do.fa_change}		\lilyGlyph{clefs.petrucci.c3_change}
	\lilyGlyph{clefs.hufnagel.do_change}		\lilyGlyph{clefs.petrucci.c4}
	\lilyGlyph{clefs.hufnagel.fa}		\lilyGlyph{clefs.petrucci.c4_change}
	\lilyGlyph{clefs.hufnagel.fa_change}		\lilyGlyph{clefs.petrucci.c5}
	\lilyGlyph{clefs.kievan.do}		\lilyGlyph{clefs.petrucci.c5_change}
	\lilyGlyph{clefs.kievan.do_change}		\lilyGlyph{clefs.petrucci.f}
	\lilyGlyph{clefs.medicaea.do}		\lilyGlyph{clefs.petrucci.f_change}
	\lilyGlyph{clefs.medicaea.do_change}		\lilyGlyph{clefs.petrucci.g}
	\lilyGlyph{clefs.medicaea.fa}		\lilyGlyph{clefs.petrucci.g_change}
	\lilyGlyph{clefs.medicaea.fa_change}		\lilyGlyph{clefs.tab}
	\lilyGlyph{clefs.mensural.c}		\lilyGlyph{clefs.tab_change}
	\lilyGlyph{clefs.mensural.c_change}		\lilyGlyph{clefs.vaticana.do}
	\lilyGlyph{clefs.mensural.f}		\lilyGlyph{clefs.vaticana.do_change}
	\lilyGlyph{clefs.mensural.f_change}		\lilyGlyph{clefs.vaticana.fa}
	\lilyGlyph{clefs.mensural.g}		\lilyGlyph{clefs.vaticana.fa_change}

lilyGlyphs defines shorter names for a few of these symbols. See Table 431.

TABLE 447: *lilyglypbs* Named Noteheads

```
\lilyGlyph{noteheads .d0doFunk}
\lilyGlyph{noteheads .d0fa}
\lilyGlyph{noteheads .d0faFunk}
\lilyGlyph{noteheads .d0faThin}
\diamond \lilyGlyph{noteheads .d0miFunk}
\triangle \lilyGlyph{noteheads .d0reFunk}
\diamond \lilyGlyph{noteheads .d0tiFunk}
\triangleright \lilyGlyph{noteheads .d1do}
\square \lilyGlyph{noteheads .d1doFunk}
\triangleright \lilyGlyph{noteheads .d1doThin}
\square \lilyGlyph{noteheads .d1doWalker}
\triangledown \lilyGlyph{noteheads .d1fa}
\triangleright \lilyGlyph{noteheads .d1faFunk}
\triangledown \lilyGlyph{noteheads .d1faThin}
\triangleright \lilyGlyph{noteheads .d1faWalker}
\diamond \lilyGlyph{noteheads .d1miFunk}
\triangle \lilyGlyph{noteheads .d1re}
\triangle \lilyGlyph{noteheads .d1reFunk}
\circle \lilyGlyph{noteheads .d1reThin}
\triangle \lilyGlyph{noteheads .d1reWalker}
\diamond \lilyGlyph{noteheads .d1ti}
\diamond \lilyGlyph{noteheads .d1tiFunk}
\triangleright \lilyGlyph{noteheads .d1tiThin}
\triangle \lilyGlyph{noteheads .d1tiWalker}
\triangleright \lilyGlyph{noteheads .d1triangle}
\triangle \lilyGlyph{noteheads .d2do}
\square \lilyGlyph{noteheads .d2doFunk}
\triangle \lilyGlyph{noteheads .d2doThin}
\square \lilyGlyph{noteheads .d2doWalker}
\triangleright \lilyGlyph{noteheads .d2fa}
\triangleright \lilyGlyph{noteheads .d2faFunk}
\triangleright \lilyGlyph{noteheads .d2faThin}
\triangleright \lilyGlyph{noteheads .d2faWalker}
\triangleright \lilyGlyph{noteheads .d2kievan}
\bullet \lilyGlyph{noteheads .d2re}
\triangle \lilyGlyph{noteheads .d2reFunk}
\bullet \lilyGlyph{noteheads .d2reThin}
\triangle \lilyGlyph{noteheads .d2reWalker}
\triangleright \lilyGlyph{noteheads .d2ti}
\bullet \lilyGlyph{noteheads .d2tiFunk}
\triangleright \lilyGlyph{noteheads .d2tiThin}
\triangle \lilyGlyph{noteheads .d2tiWalker}
\triangleright \lilyGlyph{noteheads .d2triangle}
\triangleright \lilyGlyph{noteheads .d3kievan}
\triangleright \lilyGlyph{noteheads .dM2}
\triangleright \lilyGlyph{noteheads .dM2blackmensural}
```

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```
▀ \lilyGlyph{noteheads . dM2mensural}
▀ \lilyGlyph{noteheads . dM2neomensural}
▀ \lilyGlyph{noteheads . dM2semimensural}
▀ \lilyGlyph{noteheads . dM3blackmensural}
▀ \lilyGlyph{noteheads . dM3mensural}
▀ \lilyGlyph{noteheads . dM3neomensural}
▀ \lilyGlyph{noteheads . dM3semimensural}
▀ \lilyGlyph{noteheads . drM2mensural}
▀ \lilyGlyph{noteheads . drM2neomensural}
▀ \lilyGlyph{noteheads . drM2semimensural}
▀ \lilyGlyph{noteheads . drM3mensural}
▀ \lilyGlyph{noteheads . drM3neomensural}
▀ \lilyGlyph{noteheads . drM3semimensural}
o \lilyGlyph{noteheads . s0}
· \lilyGlyph{noteheads . s0blackmensural}
♦ \lilyGlyph{noteheads . s0blackpetrucci}
≈ \lilyGlyph{noteheads . s0cross}
◊ \lilyGlyph{noteheads . s0diamond}
△ \lilyGlyph{noteheads . s0do}
△ \lilyGlyph{noteheads . s0doThin}
△ \lilyGlyph{noteheads . s0doWalker}
△ \lilyGlyph{noteheads . s0faWalker}
◊ \lilyGlyph{noteheads . s0harmonic}
♦ \lilyGlyph{noteheads . s0kievan}
■ \lilyGlyph{noteheads . s0la}
□ \lilyGlyph{noteheads . s0laFunk}
□ \lilyGlyph{noteheads . s0laThin}
□ \lilyGlyph{noteheads . s0laWalker}
◊ \lilyGlyph{noteheads . s0mensural}
◊ \lilyGlyph{noteheads . s0mi}
◊ \lilyGlyph{noteheads . s0miMirror}
◊ \lilyGlyph{noteheads . s0miThin}
◊ \lilyGlyph{noteheads . s0miWalker}
◊ \lilyGlyph{noteheads . s0neomensural}
◊ \lilyGlyph{noteheads . s0petrucci}
o \lilyGlyph{noteheads . s0re}
o \lilyGlyph{noteheads . s0reThin}
a \lilyGlyph{noteheads . s0reWalker}
▷ \lilyGlyph{noteheads . s0slash}
o \lilyGlyph{noteheads . s0sol}
o \lilyGlyph{noteheads . s0solFunk}
◊ \lilyGlyph{noteheads . s0ti}
◊ \lilyGlyph{noteheads . s0tiThin}
△ \lilyGlyph{noteheads . s0tiWalker}
▼ \lilyGlyph{noteheads . s0triangle}
o \lilyGlyph{noteheads . s1}
♦ \lilyGlyph{noteheads . s1blackpetrucci}
≈ \lilyGlyph{noteheads . s1cross}
```

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```
¤ \lilyGlyph{noteheads .s1diamond}
` \lilyGlyph{noteheads .s1kievan}
= \lilyGlyph{noteheads .s1la}
o \lilyGlyph{noteheads .s1laFunk}
o \lilyGlyph{noteheads .s1laThin}
o \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}
o \lilyGlyph{noteheads .s1sol}
o \lilyGlyph{noteheads .s1solFunk}
• \lilyGlyph{noteheads .s2}
◊ \lilyGlyph{noteheads .s2blackpetrucci}
x \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.1pes}
◊ \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 .sM2blackligemensural}
■ \lilyGlyph{noteheads .sM2kievan}
```

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```
  \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.cehalicus}
  \lilyGlyph{noteheads.svaticana.epiphonus}
  \lilyGlyph{noteheads.svaticana.inclinatum}
  \lilyGlyph{noteheads.svaticana.inner.cehalicus}
  \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}
  \lilyGlyph{noteheads.svaticana.quilisma}
  \lilyGlyph{noteheads.svaticana.reverse.plica}
  \lilyGlyph{noteheads.svaticana.reverse.vplica}
  \lilyGlyph{noteheads.svaticana.upes}
  \lilyGlyph{noteheads.svaticana.vephonous}
  \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}
```

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```
▷      \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}
▷      \lilyGlyph{noteheads .u2ti}
▷      \lilyGlyph{noteheads .u2tiFunk}
▷      \lilyGlyph{noteheads .u2tiThin}
▷      \lilyGlyph{noteheads .u2tiWalker}
▷      \lilyGlyph{noteheads .u2triangle}
▷      \lilyGlyph{noteheads .u3kievan}

\underline{\lilyGlyph{noteheads .uM2}}
\underline{\lilyGlyph{noteheads .uM2blackmensural}}
\underline{\lilyGlyph{noteheads .uM2mensural}}
\underline{\lilyGlyph{noteheads .uM2neomensural}}
\underline{\lilyGlyph{noteheads .uM2semimensural}}
\underline{\lilyGlyph{noteheads .uM3blackmensural}}
\underline{\lilyGlyph{noteheads .uM3mensural}}
\underline{\lilyGlyph{noteheads .uM3neomensural}}
\underline{\lilyGlyph{noteheads .uM3semimensural}}
\underline{\lilyGlyph{noteheads .urM2mensural}}
```

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```
▀ \lilyGlyph{noteheads.urM2neomensural}
▀ \lilyGlyph{noteheads.urM2semimensural}
▀ \lilyGlyph{noteheads.urM3mensural}
▀ \lilyGlyph{noteheads.urM3neomensural}
▀ \lilyGlyph{noteheads.urM3semimensural}
```

TABLE 448: *lilyglyp̄s* Named Accordion Symbols

▀	\lilyGlyph{accordion.bayanbass}	▀	\lilyGlyph{accordion.oldEE}
⊖	\lilyGlyph{accordion.discant}	▀	\lilyGlyph{accordion.pull}
.	\lilyGlyph{accordion.dot}	▀	\lilyGlyph{accordion.push}
⊖	\lilyGlyph{accordion.freebass}	▀	\lilyGlyph{accordion.stdbass}

lilyglyp̄s defines shorter names for all of these symbols except `\lilyGlyph{accordion.dot}`. See Table 439.

TABLE 449: *lilyglyp̄s* Named Accidentals

```
* \lilyGlyph{accidentals.doublesharp}
♭ \lilyGlyph{accidentals.flat}
↑ \lilyGlyph{accidentals.flat.arrowboth}
↓ \lilyGlyph{accidentals.flat.arrowdown}
↑ \lilyGlyph{accidentals.flat.arrowup}
‡ \lilyGlyph{accidentals.flat.slash}
§ \lilyGlyph{accidentals.flat.slashslash}
𝄪 \lilyGlyph{accidentals.flatflat}
𝄫 \lilyGlyph{accidentals.flatflat.slash}
𝄪 \lilyGlyph{accidentals.hufnagelM1}
𝄪 \lilyGlyph{accidentals.kievan1}
𝄪 \lilyGlyph{accidentals.kievanM1}
( \lilyGlyph{accidentals.leftparen}
) \lilyGlyph{accidentals.medicaealM1}
× \lilyGlyph{accidentals.mensural1}
♭ \lilyGlyph{accidentals.mensuralM1}
♩ \lilyGlyph{accidentals.mirroredflat}
♩ \lilyGlyph{accidentals.mirroredflat.backslash}
```

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```
↳ \lilyGlyph{accidentals.mirroredflat.flat}
↳ \lilyGlyph{accidentals.natural}
↑
↓ \lilyGlyph{accidentals.natural.arrowboth}
↓ \lilyGlyph{accidentals.natural.arrowdown}
↑ \lilyGlyph{accidentals.natural.arrowup}
) \lilyGlyph{accidentals.rightparen}
# \lilyGlyph{accidentals.sharp}
#
↳ \lilyGlyph{accidentals.sharp.arrowboth}
# \lilyGlyph{accidentals.sharp.arrowdown}
# \lilyGlyph{accidentals.sharp.arrowup}
# \lilyGlyph{accidentals.sharp.slashslash.stem}
# \lilyGlyph{accidentals.sharp.slashslash.stemstem}
# \lilyGlyph{accidentals.sharp.slashslashslash.stem}
# \lilyGlyph{accidentals.sharp.slashslashslash.stemstem}
\lilyGlyph{accidentals.vaticana0}
\lilyGlyph{accidentals.vaticanaM1}
```

lilyglyphs defines shorter names for a few of these symbols. See Table 433.

TABLE 450: *lilyglyphs* Named Arrowheads

► \lilyGlyph{arrowheads.close.01}	> \lilyGlyph{arrowheads.open.01}
◀ \lilyGlyph{arrowheads.close.0M1}	< \lilyGlyph{arrowheads.open.0M1}
▲ \lilyGlyph{arrowheads.close.11}	^ \lilyGlyph{arrowheads.open.11}
▼ \lilyGlyph{arrowheads.close.1M1}	▼ \lilyGlyph{arrowheads.open.1M1}

TABLE 451: *lilyglyphs* Named Alphanumerics and Punctuation

0 \lilyGlyph{zero}	4 \lilyGlyph{four}	8 \lilyGlyph{eight}
1 \lilyGlyph{one}	5 \lilyGlyph{five}	9 \lilyGlyph{nine}
2 \lilyGlyph{two}	6 \lilyGlyph{six}	
3 \lilyGlyph{three}	7 \lilyGlyph{seven}	
f \lilyGlyph{f}	p \lilyGlyph{p}	s \lilyGlyph{s}
m \lilyGlyph{m}	r \lilyGlyph{r}	z \lilyGlyph{z}
,	.	\lilyGlyph{period}
-	+	\lilyGlyph{plus}

See Table 435 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 452: Miscellaneous *lily\lyp\bs* Named Musical Symbols

˘	\lilyGlyph{brackettips.down}	.	\lilyGlyph{dots.dotvaticana}
˙	\lilyGlyph{brackettips.up}	˘	\lilyGlyph{ties.lyric.default}
.	\lilyGlyph{dots.dot}	˙	\lilyGlyph{ties.lyric.short}
◆	\lilyGlyph{dots.dotkievan}		

8 Other symbols

The following are all the symbols that didn't fit neatly or unambiguously into any of the previous sections. (Do weather symbols belong under "Science and technology"? Should dice be considered "mathematics"?) While some of the tables contain clearly related groups of symbols (e.g., symbols related to various board games), others represent motley assortments of whatever the font designer felt like drawing.

TABLE 453: `textcomp` Genealogical Symbols

★	<code>\textborn</code>	○○	<code>\textdivorced</code>	⊗	<code>\textmarried</code>
†	<code>\textdied</code>	Ѡ	<code>\textleaf</code>		

TABLE 454: `wasy sym` General Symbols

⌚	<code>\ataribox</code>	⌚	<code>\clock</code>	◀	<code>\LEFTarrow</code>	▶	<code>\RIGHTarrow</code>
🛎	<code>\bell</code>	∅	<code>\diameter</code>	⟳	<code>\leftturn</code>	⟳	<code>\rightturn</code>
☺	<code>\blacksmiley</code>	▼	<code>\DOWNNarrow</code>	⚡	<code>\lightning</code>	☺	<code>\smiley</code>
Ⓜ	<code>\Bowtie</code>	☹	<code>\frownie</code>	☎	<code>\phone</code>	☀	<code>\sun</code>
⠇	<code>\brokenvert</code>	¤	<code>\invdiameter</code>	👉	<code>\pointer</code>	▲	<code>\UParrow</code>
✓	<code>\checked</code>	✖	<code>\kreuz</code>	ଓ	<code>\recorder</code>	□	<code>\wasylozenge</code>

TABLE 455: `manfnt` Dangerous Bend Symbols

	<code>\dbend</code>		<code>\lhbend</code>		<code>\reversedvideobend</code>
-------------------------------------------------------------------------------------	---------------------	-------------------------------------------------------------------------------------	----------------------	-------------------------------------------------------------------------------------	---------------------------------

Note that these symbols descend far beneath the baseline. `manfnt` also defines non-descending versions, which it calls, correspondingly, `\textdbend`, `\textlhbend`, and `\textreversedvideobend`.

TABLE 456: 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>\mantiltedpennib</code>
—	<code>\manhpennib</code>	▼	<code>\mantriangledown</code>
▣	<code>\manimpossiblecube</code>	►	<code>\mantriangleright</code>
○	<code>\mankidney</code>	▲	<code>\mantriangleup</code>
○	<code>\manlpennkidney</code>	↓	<code>\manvpennib</code>

TABLE 457: marvosym Media Control Symbols

▶	\Forward	▼	\MoveDown	◀◀	\RewindToIndex	▲	\ToTop
▶▶	\ForwardToEnd	▲	\MoveUp	◀	\RewindToStart		
▶▶▶	\ForwardToIndex	◀	\Rewind	▼	\ToBottom		

TABLE 458: marvosym Laundry Symbols

⌚	\AtForty	⌚	\Handwash	⌚	\ShortNinetyFive
⌚	\AtNinetyFive	⌚	\IroningI	⌚	\ShortSixty
⌚	\AtSixty	⌚	\IroningII	⌚	\ShortThirty
△	\Bleech	⌚	\IroningIII	⌚	\SpecialForty
Ⓐ	\CleaningA	△	\NoBleech	⌚	\Tumbler
Ⓕ	\CleaningF	○	\NoChemicalCleaning	⌚	\WashCotton
Ⓕ	\CleaningFF	⌚	\NoIroning	⌚	\WashSynthetics
Ⓟ	\CleaningP	▢	\NoTumbler	⌚	\WashWool
Ⓟ	\CleaningPP	⌚	\ShortFifty		
ⓧ	\Dontwash	⌚	\ShortForty		

TABLE 459: marvosym Information Symbols

🚲	\Bicycle	🚹	\Gentsroom	👉	\PointingHand
⌚	\ClockLogo	🏭	\Industry	♿	\Wheelchair
☕	\Coffeecup	ℹ	\Info	✍	\WritingHand
⚽	\Football	🚻	\Ladiesroom		

TABLE 460: Other marvosym Symbols

†	\Ankh	﴿	\Bouquet	♥	\Heart	🐦	\PeaceDove
🦇	\Bat	❖	\Celtcross	👤	\ManFace	😊	\Smiley
BOOLE	\BOLogo	Ⓐ	\CircledA	⚒	\MineSign	👩	\WomanFace
BOOLE	\BOLogoL	†	\Cross	👤	\Mundus	☯	\Yinyang
BOOLE	\BOLogoP	☺	\Frowny	@	\MVAt		

TABLE 461: Miscellaneous universa Symbols

∅ ⊕ \bauforms ⊖ \bauhead

TABLE 462: Miscellaneous fourier Symbols

💣	\bomb	☺	\grimace	☒	\textthing*	☒	\textxswup*
⚠	\danger	▬	\noway	☒	\textxswdown*		

* fourier defines math-mode synonyms for a few of the preceding symbols: \textthing (“☒”), \textxswup (“☒”), and \textxswdown (“☒”).

TABLE 463: ifsym Weather Symbols

	\Cloud		\Hail		\Sleet		\WeakRain
	\FilledCloud		\HalfSun		\Snow		\WeakRainCloud
	\FilledRainCloud		\Lightning		\SnowCloud		\FilledSnowCloud
	\FilledSunCloud		\NoSun		\Sun		
	\FilledWeakRainCloud		\Rain		\SunCloud		
	\Fog		\RainCloud		\ThinFog		

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 464: ifsym Alpine Symbols

	\SummitSign		\Summit		\SurveySign		\HalfFilledHut
	\StoneMan		\Mountain		\Joch		\VarSummit
	\Hut		\IceMountain		\Flag		
	\FilledHut		\VarMountain		\VarFlag		
	\Village		\VarIceMountain		\Tent		

TABLE 465: ifsym Clocks

	\Interval		\StopWatchStart		\VarClock		\Wecker
	\StopWatchEnd		\Taschenuhr		\VarTaschenuhr		

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 466: Other ifsym Symbols

	\FilledSectioningDiamond		\Letter		\Radiation
	\Fire		\PaperLandscape		\SectioningDiamond
	\Irritant		\PaperPortrait		\Telephone
	\Cube{1}		\Cube{3}		\Cube{5}
	\Cube{2}		\Cube{4}		\Cube{6}
	\StrokeOne		\StrokeThree		\StrokeFive
	\StrokeTwo		\StrokeFour		

TABLE 467: clock Clocks

\ClockStyle	\ClockFramefalse	\ClockFrametrue
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 `\ClockFrame=true` or `\ClockFrame=false` as illustrated above. See the `clock` documentation for more information.

TABLE 468: epsdice Dice

\epsdice{1} \epsdice{3} \epsdice{5}
\epsdice{2} \epsdice{4} \epsdice{6}

TABLE 469: hhcount Dice

□ \fcdice{1} □ \fcdice{3} □ \fcdice{5}
□ \fcdice{2} □ \fcdice{4} □ \fcdice{6}

The `\fcdice` command accepts values larger than 6. For example, “`\fcdice{47}`” produces “”.

TABLE 470: stix Dice

\dicei \diceiii \dicev
 \diceii \diceiv \dicevi

TABLE 471: `\bullcntr` Tally Markers

•	<code>\bullcntr{<1>}</code>		<code>\bullcntr{<4>}</code>		<code>\bullcntr{<7>}</code>
• •	<code>\bullcntr{<2>}</code>		<code>\bullcntr{<5>}</code>		<code>\bullcntr{<8>}</code>
• • •	<code>\bullcntr{<3>}</code>		<code>\bullcntr{<6>}</code>		<code>\bullcntr{<9>}</code>

The notation for `\bullcntr` used in the above bears explanation. `\bullcntr` does not take a number as its argument but rather a L^AT_EX 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 L^AT_EX’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{<5>}</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 472: `hhcount` Tally Markers

	<code>\fcscore{1}</code>		<code>\fcscore{3}</code>	##	<code>\fcscore{5}</code>
	<code>\fcscore{2}</code>		<code>\fcscore{4}</code>		

The `\fcscore` command accepts values larger than 5. For example, “`\fcscore{47}`” produces “##########################”.

TABLE 473: 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 474: *skull* Symbols

	\skull
-----------------------------------------------------------------------------------	--------

TABLE 475: Non-Mathematical *mathabx* Symbols

	\rip
-----------------------------------------------------------------------------------	------

TABLE 476: *skak* Chess Informator Symbols

\mp	\bbetter	\circ	\doublepawns	$\circ\circ$	\seppawns
$\rightarrow+$	\bdecisive	\perp	\ending	O-O	\shortcastling
\supset	\betteris	=	\equal	\oplus	\timelimit
\boxplus	\bishoppair	\Leftrightarrow	\file	∞	\unclear
\mp	\bupperhand	\gg	\kside	$\circ\circ$	\unitedpawns
\times	\capturesymbol	O-O-O	\longcastling	R	\various
O	\castlingchar	X	\markera	\pm	\wbetter
-	\castlinghyphen	O	\markerb	$+-$	\wdecisive
\boxplus	\centre	#	\mate	\times	\weakpt
+	\checksymbol	>	\morepawns	\sqsubset	\with
RR	\chesscomment	O	\moreroom	\rightarrow	\withattack
\parallel	\chessetc	N	\novelty	\triangle	\withidea
$\overline{-}$	\chesssee	\square	\onlymove	\uparrow	\withinit
$\overline{\approx}$	\compensation	\blacksquare	\opposbishops	\sqcup	\without
\rightleftharpoons	\counterplay	\diamond	\passedpawn	\pm	\wupperhand
C	\devadvantage	\ll	\qside	\odot	\zugzwang
$\nearrow\swarrow$	\diagonal	\blacksquare	\samebishops		

TABLE 477: skak Chess Pieces and Chessboard Squares

	\BlackBishopOnBlack		\BlackRookOnBlack		\WhiteKingOnBlack
	\BlackBishopOnWhite		\BlackRookOnWhite		\WhiteKingOnWhite
	\BlackEmptySquare		\symbishop		\WhiteKnightOnBlack
	\BlackKingOnBlack		\symking		\WhiteKnightOnWhite
	\BlackKingOnWhite		\symknight		\WhitePawnOnBlack
	\BlackKnightOnBlack		\sympawn		\WhitePawnOnWhite
	\BlackKnightOnWhite		\symqueen		\WhiteQueenOnBlack
	\BlackPawnOnBlack		\symrook		\WhiteQueenOnWhite
	\BlackPawnOnWhite		\WhiteBishopOnBlack		\WhiteRookOnBlack
	\BlackQueenOnBlack		\WhiteBishopOnWhite		\WhiteRookOnWhite
	\BlackQueenOnWhite		\WhiteEmptySquare		

The *skak* package also provides commands for drawing complete chessboards. See the *skak* documentation for more information.

TABLE 478: igo Go Symbols

○ \blackstone[\igocircle]	○ \whitestone[\igocircle]
✗ \blackstone[\igocross]	✗ \whitestone[\igocross]
● \blackstone[\igonone]	○ \whitestone[\igonone]
□ \blackstone[\igosquare]	□ \whitestone[\igosquare]
△ \blackstone[\igotriangle]	△ \whitestone[\igotriangle]

In addition to the symbols shown above, *igo*'s `\blackstone` and `\whitestone` commands accept numbers from 1 to 99 and display them circled as ①, ②, ③, ..., ⑨9 and ①, ②, ③, ..., ⑨9, respectively.

The *igo* package is intended to typeset complete Go boards (goban). See the *igo* documentation for more information.

TABLE 479: go Go Symbols

+	\botborder	L	\lftbotcorner	T	\rttopcorner
+	\empty	F	\lfttopcorner	O	\square
+	\hoshi	H	\rtborder	T	\topborder
F	\lftborder	J	\rtbotcorner	O	\triangle

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 ①, ②, ③, ..., ㉚ and ①, ②, ③, ..., ㉚, respectively. \black and \white additionally accept \square and \triangle as arguments, producing O and Δ for \black and O and Δ for \white.

The go package is intended to typeset complete Go boards (goban). See the go documentation for more information.

TABLE 480: metre Metrical Symbols

x	\a	⌿	\bBm		\cc	⌿	\Mbb	:	\Pppp	⊗	\t
⌚	\B	⌚	\bbm		\Ccc	⌚	\mbbx	⋮	\pppp	—	\tsbm
⌚	\b	⌚	\Bbm	—	\m	∞	\oo	⋮	\Ppppp	—	\tsmb
⌚	\Bb	⌚	\bbmb	‘	\M	.	\p	⋮	\ppppp	—	\tsmm
⌚	\BB	⌚	\bbmx	ꝝ	\ma	ꝝ	\pm	⠇	\ps	⋮	\vppm
⌚	\bb	⌚	\bm	ꝝ	\Mb	:	\pp	⋮	\pxp	⋮	\vpppm
⌚	\bB	⌚	\Bm	ꝝ	\mb	:	\Pp	⋮	\Pxp	::	\x
⌚	\bba		\c	⌚	\mBb	ꝝ	\ppm	~	\R		
⌚	\bbb		\C	⌚	\mbB	⋮	\ppp	~	\r		
⌚	\BBm		\Cc	ꝝ	\mbb	:	\Ppp	⊗	\T		

The preceding symbols are valid only within the argument to the `metre` command.

TABLE 481: metre Small and Large Metrical Symbols

÷	\anaclasis	÷	\Anaclasis
<	\antidiple	<	\Antidiple
≺	\antidiple*	≺	\Antidiple*
○	\antisigma	○	\Antisigma
※	\asteriscus	※	\Asteriscus
˄	\catalexis	˄	\Catalexis
˃	\diple	˃	\Diple
⩸	\diple*	⩸	\Diple*
—	\obelus	—	\Obelus
÷	\obelus*	÷	\Obelus*
~	\respondens	~	\Respondens
⊗	\terminus	⊗	\Terminus
⊕	\terminus*	⊕	\Terminus*

TABLE 482: teubner Metrical Symbols

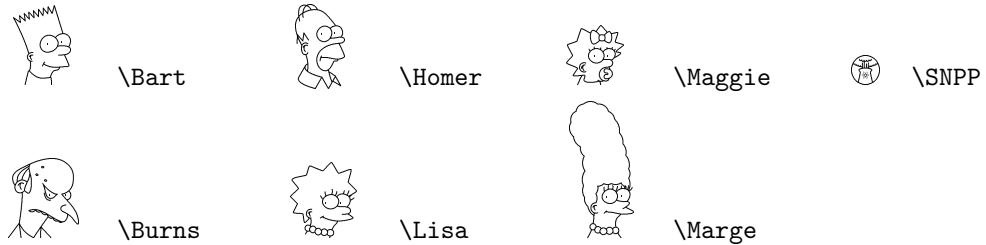
oo	\aeolicbii	o	\barbrevis	+	\ipercatal
ooo	\aeolicbiii	oo	\bbrevis	-	\longa
oooo	\aeolicbiv	u	\brevis	~~	\ubarbbrevis
x	\anceps	^	\catal	~	\ubarbrevis
~	\ancepsdbrevis	o	\corona	~~~	\ubarsbrevis
~	\banceps	o	\coronainv	o	\ubrevislonga
~~	\barbbrevis	H	\hiatus		

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 `\longas`, two `\barbbrevises`, four `\brevises`, and a `\dBar` into “`_~~_~~_|_oo_oo_`”. See the *teubner* documentation for more information.

TABLE 483: dictsym Dictionary Symbols

☒	\dsaeronautical	†	\dscommercial	☒	\dsmedical
↗	\dsagricultural	☒	\dsheraldical	☒	\dsmilitary
▲	\dsarchitectural	☒	\dsjuridical	☒	\dsrailways
⌚	\dsbiological	☒	\dsliterary	☒	\dstechnical
⚗	\dschemical	☒	\dsmathematical		

TABLE 484: simpsons Characters from *The Simpsons*



The location of the characters' pupils can be controlled with the `\Goofy` command. See *A METAFONT of ‘Simpsons’ characters* [Che97] for more information. Also, each of the above can be prefixed with `\Left` to make the character face left instead of right:

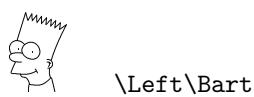


TABLE 485: pmboxdraw Box-Drawing Symbols

	\textblock		\textSFli		\textSFxli		\textSFxxiii
	\textdkshade		\textSFlii		\textSFxlvi		\textSFxxiv
	\textdnblock		\textSFliii	=	\textSFxlivi		\textSFxxv
	\textlfblock		\textSFliv		\textSFxliv		\textSFxxvi
	\textltshade		\textSFv		\textSFxlxi		\textSFxxvii
	\textrtblock		\textSFvi		\textSFxlvi		\textSFxxviii
	\textSFi		\textSFvii		\textSFxlvi		\textSFxxxix
	\textSFii		\textSFviii		\textSFxlvii		\textSFxxxvi
	\textSFiii		\textSFx		\textSFxlviii		\textSFxxxvii
	\textSFiv		\textSFxi		\textSFxx		\textSFxxxviii
	\textSFix		\textSFxix		\textSFxxi		\textshade
	\textSFiI		\textSFxl		\textSFxxii		\textupblock

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 486: staves Magical Staves

	\staveI		\staveXXIV		\staveXLVII
	\staveII		\staveXXV		\staveXLVIII
	\staveIII		\staveXXVI		\staveXLIX
	\staveIV		\staveXXVII		\staveL
	\staveV		\staveXXVIII		\staveLI
	\staveVI		\staveXXIX		\staveLII
	\staveVII		\staveXXX		\staveLIII
	\staveVIII		\staveXXXI		\staveLIV
	\staveIX		\staveXXXII		\staveLV

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	\staveX		\staveXXXIV		\staveLVI
	\staveXI		\staveXXXV		\staveLVII
	\staveXII		\staveXXXV		\staveLVIII
	\staveXIII		\staveXXXVI		\staveLIX
	\staveXIV		\staveXXXVII		\staveLX
	\staveXV		\staveXXXVIII		\staveLXI
	\staveXVI		\staveXXXIX		\staveLXII
	\staveXVII		\staveXL		\staveLXIII
	\staveXVIII		\staveXLI		\staveLXIV
	\staveXIX		\staveXLII		\staveLXV
	\staveXX		\staveXLIII		\staveLXVI
	\staveXXI		\staveXLIV		\staveLXVII
	\staveXXII		\staveXLV		\staveLXVIII
	\staveXXIII		\staveXLVI		

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§ionid=5&id=18&Itemid=60 (TinyURL: <http://tinyurl.com/25979m>). For example, \staveL (“

TABLE 487: 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 488: GIMP Phases of the Moon

⊕ \MoonPha{1} ♂ \MoonPha{2} ☽ \MoonPha{3} ♀ \MoonPha{4}

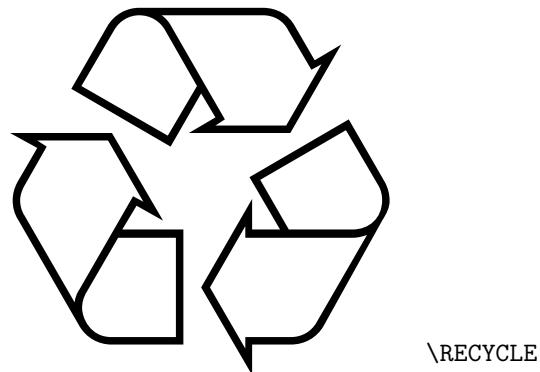
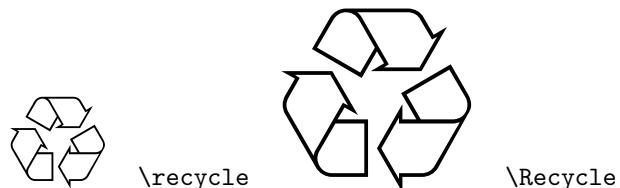
TABLE 489: $\text{G}^{\text{I}}\text{T}_{\text{2}}\text{e}$ Recycling Symbols

 \Greenpoint

TABLE 490: marvosym Recycling Symbols

 \PackingWaste  \Recycling

TABLE 491: recycle Recycling Symbols



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 *number*)” 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 492: Other $\text{G}^{\text{I}}\text{T}_{\text{2}}\text{e}$ Symbols

 \Info	 \Request
 \Postbox	 \Telephone

TABLE 493: soyombo Soyombo Symbols

	\Soyombo		\sA*		\sO*
--	----------	--	------	--	------

* These symbols require that the Soyombo font be active (“{\text{\\soyombo} … }”).

TABLE 494: knitting Knitting Symbols

	\textknit{!}		\textknit{[]}		\textknit{Q}
	\textknit{"}		\textknit{[]}}		\textknit{q}
	\textknit{()}		\textknit{A}		\textknit{R}
	\textknit{()}}		\textknit{a}		\textknit{r}
	\textknit{*}		\textknit{B}		\textknit{S}
	\textknit{-}		\textknit{b}		\textknit{s}
	\textknit{2}		\textknit{E}		\textknit{T}
	\textknit{3}		\textknit{F}		\textknit{t}
	\textknit{4}		\textknit{f}		\textknit{U}
	\textknit{5}		\textknit{H}		\textknit{u}
	\textknit{6}		\textknit{h}		\textknit{V}
	\textknit{7}		\textknit{I}		\textknit{v}
	\textknit{8}		\textknit{i}		\textknit{W}
	\textknit{9}		\textknit{j}		\textknit{w}
	\textknit{:}		\textknit{j}		\textknit{X}
	\textknit{;}		\textknit{l}		\textknit{x}
	\textknit{<}		\textknit{l}		\textknit{Y}
	\textknit{=}		\textknit{M}		\textknit{y}
	\textknit{>}		\textknit{m}		\textknit{Z}
	\textknit{@}		\textknit{o}		\textknit{z}

The `knitting` package is intended to typeset complete knitting charts. See the `knitting` documentation for more information.

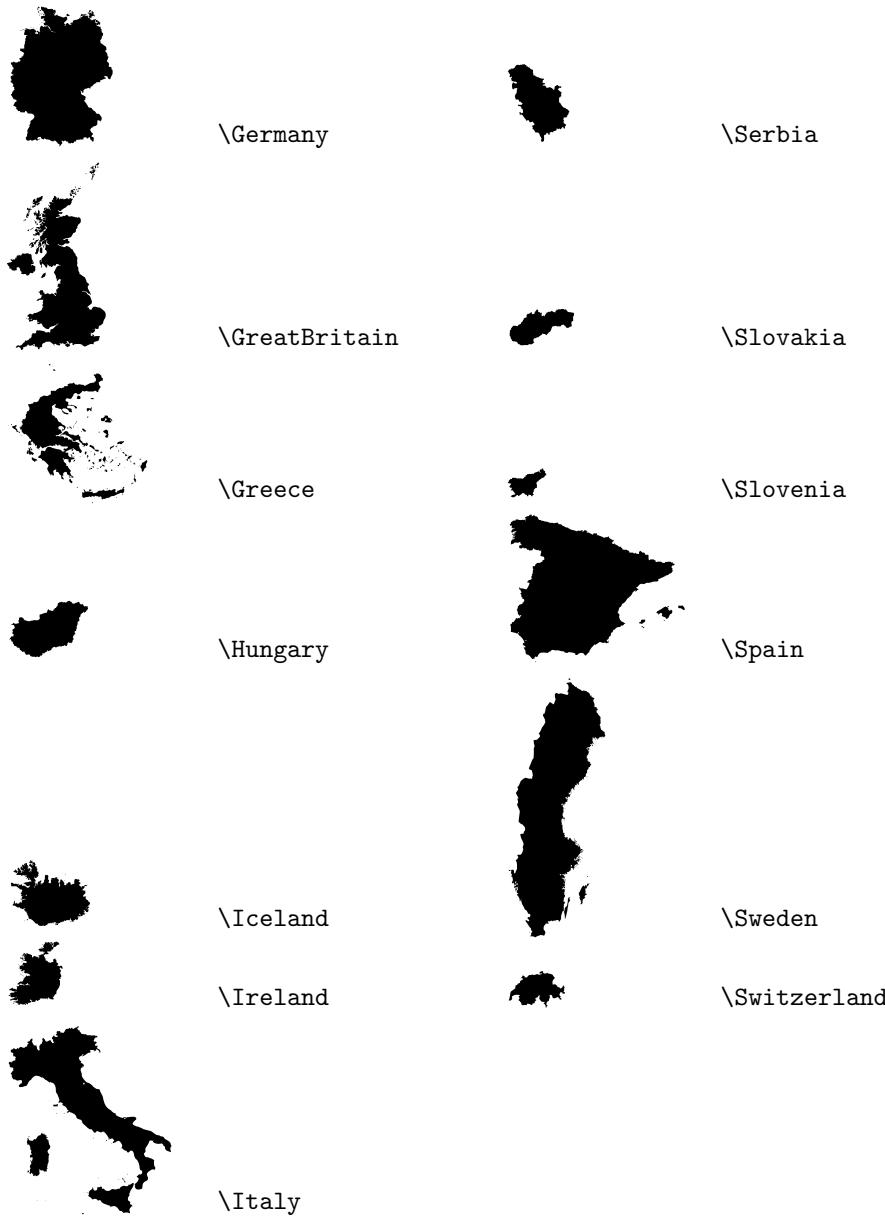
Some symbols behave differently when used as part of a sequence. For example, contrast `\textknit{1}` (“+”), `\textknit{11}` (“++”), and `\textknit{111}` (“+++”). Similarly, contrast `\textknit{"}` (“””) and `\textknit{""}` (“””). Again, see the `knitting` documentation for more information.

TABLE 495: CountriesOfEurope Country Maps

	\Albania		\Latvia
	\Andorra		\Liechtenstein
	\Austria		\Lithuania
	\Belarus		\Luxembourg
	\Belgium		\Macedonia
	\Bosnia		\Malta
	\Bulgaria		\Moldova
	\Croatia		\Montenegro
	\Czechia		\Netherlands
	\Denmark		\Norway
	\Estonia		\Poland
	\Finland		\Portugal
	\France		\Romania

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The preceding commands work only when the `CountriesOfEurope` font family is active. For convenience, the package defines a `\CountriesOfEuropeFamily` command that switches to that font family.

By default, countries are drawn in the current font size. Hence, “`\CountriesOfEuropeFamily\France`” draws a nearly unrecognizable “”. For clarity of presentation, Table 495 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 496: Miscellaneous arev Symbols

	\anchor		\invsmileface		\skull		\warning
	\biohazard		\radiation		\smileface		\yinyang
	\heavyqtleft		\recycle		\steaming		
	\heavyqtright		\sadface		\swords		

TABLE 497: cookingsymbols Cooking Symbols

	\Bottomheat		\Fork		\Knife		\Topbottomheat
	\Dish		\Gasstove		\Oven		\Topheat
	\Fanoven		\Gloves		\Spoon		

TABLE 498: tikzsymbols Cooking Symbols

	\bakingplate		\cooker		\oven		\rollingpin
	\blender		\eggbeater		\pan		\sieve
	\bottle		\fryingpan		\peeler		\squeezer
	\bowl		\grater		\pot		\trident

`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, \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 499: tikzsymbols Emoticons

	\Annoey		\Neutrey		\rWalley		\Womey
	\Cat		\NiceReapey		\Sadey		\Walley
	\Cooley		\Ninja		\Sey		\Winkey
	\Innocey		\Nursey		\Smiley		\wInnocey
	\Laughey		\oldWinkey		\Tongey		\Xkey

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. See the `tikzsymbols` documentation for more information.

TABLE 500: *tikzsymbols* 3D Emoticons

	\dAnnoey		\dNinja		\dSmiley		\dKey
	\dCooley		\dNursey		\dTongey		\olddWinkey
	\dInnocey		\drWalley		\dVomey		
	\dLaughey		\dSadey		\dWalley		
	\dNeutrey		\dSey		\dWinkey		

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 500 accepts one or more color arguments for further customization. See the *tikzsymbols* documentation for more information.

TABLE 501: *tikzsymbols* Trees

	\Autumntree		\Summertree		\WorstTree
	\Springtree		\Wintertree		

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 502: Miscellaneous *tikzsymbols* Symbols

	\Bed		\Chair		\Fire		\Snowman		\Tribar
	\Candle		\Coffeecup		\Moai		\Strichmaxerl		

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 503: Miscellaneous *bclogo* Symbols

	\bcattention		\bcetoile		\bcpanchant
	\bcbombe		\bcfemme		\bcpeaceandlove
	\bcbook		\bcfeujaune		\bcpluie

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	\bccalendrier		\bcfeuro rouge		\bcplume
	\bccle		\bcfeutricolore		\bcpoisson
	\bcclefa		\bcfeuvert		\bcquestion
	\bcclesol		\bcfleur		\bcrecyclage
	\bccoeur		\bchomme		\bcrosevents
	\bccrayon		\bchorloge		\bcsmbh
	\bccube		\bcicosaedre		\bcsmmh
	\bcdallemande		\bcinfo		\bcsoleil
	\bcdanger		\bcinterdit		\bcspadesuit
	\bcdautriche		\bclampe		\bcstop
	\bcdbelgique		\bccloupe		\bctakecare
	\bcdbulgarie		\bcneige		\bctetraedre
	\bcdfrance		\bcnote		\bctrefle
	\bcditalie		\bcnucleaire		\bctrombone
	\bcdluxembourg		\bcoctaedre		\bcvaletcoeur
	\bcdodecaedre		\bcoeil		\bcvelo
	\bcdpaysbas		\bcorne		\bcyin
	\bcdz		\bcours		
	\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 504: fontawesome Web-Related Icons

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\faBitbucket	\faGithubSquare	\faShoppingCart
\faBitbucketSquare	\faGitSquare	\faSignal
\faBlackTie	\faGlass	\faSignIn
\faBold	\faGlobe	\faSignOut
\faBolt	\faGoogle	\faSimplybuilt
\faBomb	\faGooglePlus	\faSitemap
\faBook	\faGooglePlusSquare	\faSkyatlas
\faBookmark	\faGoogleWallet	\faSkype
\faBookmark0	\faGraduationCap	\faSlack
\faBriefcase	\faGratipay	\faSliders
\faBug	\faHackerNews	\faSlideshare
\faBuilding	\faHdd0	\faSmile0
\faBuilding0	\faHeader	\faSort
\faBullhorn	\faHeadphones	\faSortAlphaAsc
\faBullseye	\faHeart	\faSortAlphaDesc
\faBus	\faHeartbeat	\faSortAmountAsc
\faBuySellads	\faHeart0	\faSortAmountDesc
\faCalculator	\faHistory	\faSortAsc
\faCalendar	\faHome	\faSortDesc
\faCalendarCheck0	\faHospital0	\faSortNumericAsc
\faCalendarMinus0	\faHourglass	\faSortNumericDesc
\faCalendar0	\faHourglassEnd	\faSoundcloud
\faCalendarPlus0	\faHourglassHalf	\faSpaceShuttle
\faCalendarTimes0	\faHourglass0	\faSpinner
\faCamera	\faHourglassStart	\faSpoon
\faCameraRetro	\faHouzz	\faSpotify
\faCar	\faHSquare	\faStackExchange
\faCaretDown	\faHtml5	\faStackOverflow
\faCaretLeft	\faICursor	\faSteam
\faCaretRight	\faInbox	\faSteamSquare
\faCaretSquare0Down	\faIndent	\faStepBackward
\faCaretSquare0Left	\faIndustry	\faStepForward
\faCaretSquare0Right	\faInfo	\faStethoscope
\faCaretSquare0Up	\faInfoCircle	\faStickyNote
\faCaretUp	\faInstagram	\faStickyNote0
\faCartArrowDown	\faInternetExplorer	\faStop
\faCartPlus	\faIoxhost	\faStreetView
\faCc	\faItalic	\faStrikethrough
\faCcAmex	\faJoomla	\faStumbleupon
\faCcDinersClub	\faJsfiddle	\faStumbleuponCircle
\faCcDiscover	\faKey	\faSubscript
\faCcJcb	\faKeyboard0	\faSubway
\faCcMastercard	\faLanguage	\faSuitcase
\faCcPaypal	\faLaptop	\faSuperscript
\faCcStripe	\faLastfm	\faTable
\faCcVisa	\faLastfmSquare	\faTablet
\faCertificate	\faLeaf	\faTachometer
\faChainBroken	\faLeanpub	\faTag
\faChild	\faLemon0	\faTags

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⌚	\faChrome	⬇	\faLevelDown	☰	\faTasks
📋	\faClipboard	⬆	\faLevelUp	🚕	\faTaxi
🕒	\faClockO	🌐	\faLifeRing	📺	\faTelevision
📄	\faClone	💡	\faLightbulbO)._	\faTencentWeibo
☁	\faCloud	📈	\faLineChart	₏	\faTerminal
🌩	\faCloudDownload	🔑	\faLink	❗	\faTextHeight
🌩	\faCloudUpload	.linkedin	\faLinkedin	ተ	\faTextWidth
</>	\faCode	linkedin	\faLinkedinSquare	☷	\faTh
⚡	\faCodeFork	🐧	\faLinux	☷	\faThLarge
깃	\faCodepen	☰	\faList	☷	\faThList
☕	\faCoffee	☰	\faListAlt	📌	\faThumbTack
⚙	\faCog	☰	\faListOl	🎟	\faTicket
⚙	\faCogs	☰	\faListUl	💧	\faTint
☷	\faColumns	↗	\faLocationArrow	“(”)	\faToggleOff
💬	\faComment	🔒	\faLock	“(”)	\faToggleOn
💬	\faCommenting	✍	\faMagic	🚂	\faTrain
💬	\faCommentingO	🧲	\faMagnet	🗑	\faTrash
💬	\faCommentO	🚹	\faMale	🗑	\faTrashO
💬	\faComments	gMaps	\faMap	🌲	\faTree
💬	\faCommentsO	📍	\faMapMarker	▣	\faTrello
🧭	\faCompass	📍	\faMapO	🧭	\faTripadvisor
↗	\faCompress	📍	\faMapPin	🏆	\faTrophy
🌐	\faConnectdevelop	➡	\faMapSigns	🚚	\faTruck
💻	\faContao	Ⓜ	\faMaxcdn	TTY	\faTty
💳	\faCreditCard	Ⓜ	\faMeanpath	Tumblr	\faTumblr
✂	\faCrop	Ⓜ	\faMedium	Tumblr	\faTumblrSquare
❖	\faCrosshairs	__["`"]	\faMedkit	ETwitter	\faTwitter
.Css	\faCss3	☺	\faMehO	ETwitter	\faTwitterSquare
📦	\faCube	🎤	\faMicrophone	☂	\faUmbrella
📦	\faCubes	🎤	\faMicrophoneSlash	_UNDERLINE	\faUnderline
🍴	\faCutlery	-	\faMinus	🏛	\faUniversity
📦	\faDashcube	●	\faMinusCircle	🔓	\faUnlock
📦	\faDatabase	◻	\faMinusSquare	🔒	\faUnlockAlt
📦	\faDelicious	□	\faMinusSquareO	⬆	\faUpload
💻	\faDesktop	□	\faMobile	👤	\faUser
✗	\faDeviantart	💰	\faMoney	👤	\faUserMd
iamond	\faDiamond	🏍	\faMotorcycle	👤+	\faUserPlus
digg	\faDigg	↗	\faMousePointer	👤	\faUsers
⬇	\faDownload	🎵	\faMusic	🔒	\faUserSecret
🏀	\faDribbble	📰	\faNewspaperO	✖	\faUserTimes
Dropbox	\faDropbox	🖼	\faObjectGroup	🎥	\faVideoCamera
Drupal	\faDrupal	🖼	\faObjectUngroup	Vimeo	\faVimeo
⏏	\faEject	ଓ	\faOdnoklassniki	Vimeo	\faVimeoSquare
⋮	\faEllipsisH	ଓ	\faOdnoklassnikiSquare	Vine	\faVine
⋮	\faEllipsisV	⠇	\faOpenCart	VK	\faVk
✳	\faEmpire	👤	\faOpenid	🔉	\faVolumeDown
✉	\faEnvelope	O	\faOpera	🔉	\faVolumeOff
✉	\faEnvelopeO	✉	\faOptinMonster	🔉	\faVolumeUp
✉	\faEnvelopeSquare	☰	\faOutdent		

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	\faEraser		\faPagelines		\faWeibo
	\faExchange		\faPaintBrush		\faWeixin
	\faExclamation		\faPaperclip		\faWhatsapp
	\faExclamationCircle		\faPaperPlane		\faWheelchair
	\faExclamationTriangle		\faPaperPlane0		\faWifi
	\faExpand		\faParagraph		\faWikipediaW
	\faExpeditedssl		\faPause		\faWindows
	\faExternalLink		\faPaw		\faWordpress
	\faExternalLinkSquare		\faPaypal		\faWrench
	\faEye		\faPhone		\faKing
	\faEyedropper		\faPhoneSquare		\faKingSquare
	\faEyeSlash		\faPicture0		\faYahoo
	\faFacebook		\faPieChart		\faYCombinator
	\faFacebookOfficial		\faPiedPiper		\faYelp
	\faFacebookSquare		\faPiedPiperAlt		\faYoutube
	\faFastBackward		\faPinterest		\faYoutubePlay
	\faFastForward		\faPinterestP		\faYoutubeSquare
	\faFax		\faPinterestSquare		

fontawesome defines synonyms for many of the preceding symbols:

	\faAutomobile		\faFileZip0		\faRa
	\faBank		\faFlash		\faReorder
	\faBarChart0		\faGe		\faSave
	\faBattery0		\faGear		\faSend
	\faBattery1		\faGears		\faSend0
	\faBattery2		\faGittip		\faSoccerBall0
	\faBattery3		\faGroup		\faSortDown
	\faBattery4		\faHotel		\faSortUp
	\faCab		\faImage		\faSupport
	\faChain		\faInstitution		\faToggleDown
	\faCopy		\faLegal		\faToggleLeft
	\faCut		\faLifeBouy		\faToggleRight
	\faDashboard		\faLifeSaver		\faToggleUp
	\faDedent		\faMailForward		\faTv
	\faEdit		\faMailReply		\faUnlink
	\faFacebookF		\faMailReplyAll		\faUnsorted
	\faFeed		\faMobilePhone		\faWarning
	\faFileMovie0		\faMortarBoard		\faWechat
	\faFilePhoto0		\faNavicon		\faYc
	\faFilePicture0		\faPaste		\faYCombinator
	\faFileSound0		\faPhoto		\faYCombinatorSquare
					\faYcSquare

TABLE 505: rubikcube Rubik's Cube Rotations

	\rrhD		\rrhF		\rrhLw		\rrhRw		\rrhU
	\rrhDa		\rrhFp		\rrhLwp		\rrhRwp		\rrhUa
	\rrhDap		\rrhFw		\rrhM		\rrhSd		\rrhUap
	\rrhDp		\rrhFwp		\rrhMp		\rrhSdp		\rrhUp
	\rrhDs		\rrhL		\rrhR		\rrhS1		\rrhUs
	\rrhDsp		\rrhLa		\rrhRa		\rrhSlp		\rrhUsp
	\rrhDw		\rrhLap		\rrhRap		\rrhSr		\rrhUw
	\rrhDwp		\rrhLp		\rrhRp		\rrhSrp		\rrhUwp
	\rrhE		\rrhLs		\rrhRs		\rrhSu		
	\rrhEp		\rrhLsp		\rrhRsp		\rrhSup		

All `rubikcube` symbols are implemented with 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 “**Ua**) as well as commands that produce colored illustrations of Rubik's Cube configurations and rotations. See the `rubikcube` documentation for more information.

9 Fonts with minimal L^AT_EX support

The symbol fonts shown in this section are provided without a corresponding L^AT_EX 2_< 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^AT_EX font family. Alas, most of the fonts in this section do not even define a L^AT_EX 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 ** 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 506: hands Fists

	\Pisymbol{hands}{65}		\Pisymbol{hands}{67}
	\Pisymbol{hands}{66}		\Pisymbol{hands}{68}

TABLE 507: greenpoint Recycling Symbols

TABLE 508: nkarta Map Symbols

○	\Pisymbol{nkarta}{33}	◊	\Pisymbol{nkarta}{96}	●	\Pisymbol{nkarta}{193}
◎	\Pisymbol{nkarta}{34}	◀	\Pisymbol{nkarta}{97}	□	\Pisymbol{nkarta}{194}
△	\Pisymbol{nkarta}{35}	↑	\Pisymbol{nkarta}{98}	■	\Pisymbol{nkarta}{195}
◇	\Pisymbol{nkarta}{36}	🌐	\Pisymbol{nkarta}{99}	▢	\Pisymbol{nkarta}{196}
○	\Pisymbol{nkarta}{37}	▲	\Pisymbol{nkarta}{100}	▢	\Pisymbol{nkarta}{197}
★	\Pisymbol{nkarta}{38}	★	\Pisymbol{nkarta}{101}	✈	\Pisymbol{nkarta}{198}
⊕	\Pisymbol{nkarta}{39}	✉	\Pisymbol{nkarta}{102}	✉	\Pisymbol{nkarta}{199}
↓	\Pisymbol{nkarta}{40}	↑	\Pisymbol{nkarta}{103}	→	\Pisymbol{nkarta}{200}
↓	\Pisymbol{nkarta}{41}	↳	\Pisymbol{nkarta}{104}	▲	\Pisymbol{nkarta}{201}
★	\Pisymbol{nkarta}{42}	🕒	\Pisymbol{nkarta}{105}	◆	\Pisymbol{nkarta}{202}
..	\Pisymbol{nkarta}{43}	▲	\Pisymbol{nkarta}{106}	■	\Pisymbol{nkarta}{203}
☞	\Pisymbol{nkarta}{44}	➤	\Pisymbol{nkarta}{107}	■	\Pisymbol{nkarta}{204}

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	\Pisymbol{nkarta}{92}	\boxtimes	\Pisymbol{nkarta}{189}		\Pisymbol{nkarta}{252}
	\Pisymbol{nkarta}{93}	\times	\Pisymbol{nkarta}{190}		\Pisymbol{nkarta}{253}
	\Pisymbol{nkarta}{94}	\circ	\Pisymbol{nkarta}{191}		\Pisymbol{nkarta}{254}
	\Pisymbol{nkarta}{95}	$*$	\Pisymbol{nkarta}{192}		

TABLE 509: moonphase Astronomical Symbols

	\Pisymbol{moonphase}{0}		\Pisymbol{moonphase}{2}
	\Pisymbol{moonphase}{1}		\Pisymbol{moonphase}{3}

TABLE 510: astrosym Astronomical Symbols

	\Pisymbol{astrosym}{0}		\Pisymbol{astrosym}{132}
	\Pisymbol{astrosym}{1}		\Pisymbol{astrosym}{133}
	\Pisymbol{astrosym}{2}		\Pisymbol{astrosym}{134}
	\Pisymbol{astrosym}{3}		\Pisymbol{astrosym}{135}
	\Pisymbol{astrosym}{4}		\Pisymbol{astrosym}{136}
	\Pisymbol{astrosym}{5}		\Pisymbol{astrosym}{137}
	\Pisymbol{astrosym}{6}		\Pisymbol{astrosym}{138}
	\Pisymbol{astrosym}{7}		\Pisymbol{astrosym}{139}
	\Pisymbol{astrosym}{8}		\Pisymbol{astrosym}{140}
	\Pisymbol{astrosym}{9}		\Pisymbol{astrosym}{141}
	\Pisymbol{astrosym}{10}		\Pisymbol{astrosym}{142}
	\Pisymbol{astrosym}{11}		\Pisymbol{astrosym}{143}
	\Pisymbol{astrosym}{12}		\Pisymbol{astrosym}{144}
	\Pisymbol{astrosym}{13}		\Pisymbol{astrosym}{145}
	\Pisymbol{astrosym}{14}		\Pisymbol{astrosym}{146}
	\Pisymbol{astrosym}{15}		\Pisymbol{astrosym}{147}
	\Pisymbol{astrosym}{16}		\Pisymbol{astrosym}{148}
	\Pisymbol{astrosym}{17}		\Pisymbol{astrosym}{149}
	\Pisymbol{astrosym}{18}		\Pisymbol{astrosym}{150}
	\Pisymbol{astrosym}{19}		\Pisymbol{astrosym}{151}

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⌚	\Pisymbol{astrosym}{20}	⌚	\Pisymbol{astrosym}{152}
❖	\Pisymbol{astrosym}{21}	❖	\Pisymbol{astrosym}{153}
♓	\Pisymbol{astrosym}{22}	♓	\Pisymbol{astrosym}{154}
♑	\Pisymbol{astrosym}{23}	♑	\Pisymbol{astrosym}{155}
♒	\Pisymbol{astrosym}{24}	♒	\Pisymbol{astrosym}{156}
♑	\Pisymbol{astrosym}{25}	♑	\Pisymbol{astrosym}{157}
♒	\Pisymbol{astrosym}{26}	♒	\Pisymbol{astrosym}{158}
♒	\Pisymbol{astrosym}{27}	♒	\Pisymbol{astrosym}{159}
♒	\Pisymbol{astrosym}{28}	★	\Pisymbol{astrosym}{160}
⊕	\Pisymbol{astrosym}{29}	△	\Pisymbol{astrosym}{161}
♂	\Pisymbol{astrosym}{30}	□	\Pisymbol{astrosym}{162}
♃	\Pisymbol{astrosym}{31}	▲	\Pisymbol{astrosym}{163}
♄	\Pisymbol{astrosym}{32}	♂	\Pisymbol{astrosym}{164}
*	\Pisymbol{astrosym}{33}	♃	\Pisymbol{astrosym}{165}
♌	\Pisymbol{astrosym}{34}	♅	\Pisymbol{astrosym}{166}
↖	\Pisymbol{astrosym}{35}	♌	\Pisymbol{astrosym}{167}
♌	\Pisymbol{astrosym}{36}	♍	\Pisymbol{astrosym}{168}
♌	\Pisymbol{astrosym}{37}	*	\Pisymbol{astrosym}{169}
□	\Pisymbol{astrosym}{38}	♎	\Pisymbol{astrosym}{178}
○	\Pisymbol{astrosym}{39}	♎	\Pisymbol{astrosym}{179}
●	\Pisymbol{astrosym}{40}	▽	\Pisymbol{astrosym}{180}
☽	\Pisymbol{astrosym}{41}	▽	\Pisymbol{astrosym}{181}
☾	\Pisymbol{astrosym}{42}	*	\Pisymbol{astrosym}{182}
☽	\Pisymbol{astrosym}{43}	△	\Pisymbol{astrosym}{183}
☽	\Pisymbol{astrosym}{44}	□	\Pisymbol{astrosym}{184}
☽	\Pisymbol{astrosym}{45}	▲	\Pisymbol{astrosym}{185}
☽	\Pisymbol{astrosym}{46}	♂	\Pisymbol{astrosym}{186}
☽	\Pisymbol{astrosym}{47}	♃	\Pisymbol{astrosym}{187}
☽	\Pisymbol{astrosym}{48}	♅	\Pisymbol{astrosym}{188}
☽	\Pisymbol{astrosym}{49}	♌	\Pisymbol{astrosym}{189}
*	\Pisymbol{astrosym}{50}	♍	\Pisymbol{astrosym}{190}
*	\Pisymbol{astrosym}{51}	*	\Pisymbol{astrosym}{191}
*	\Pisymbol{astrosym}{52}	⊙	\Pisymbol{astrosym}{200}
❖	\Pisymbol{astrosym}{53}	♂	\Pisymbol{astrosym}{201}
❖	\Pisymbol{astrosym}{54}	♃	\Pisymbol{astrosym}{202}
❖	\Pisymbol{astrosym}{55}	♅	\Pisymbol{astrosym}{203}
❖	\Pisymbol{astrosym}{56}	♂	\Pisymbol{astrosym}{204}

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⌚	\Pisymbol{astrosym}{57}	⌚	\Pisymbol{astrosym}{205}
⚡	\Pisymbol{astrosym}{58}	⚡	\Pisymbol{astrosym}{206}
└	\Pisymbol{astrosym}{59}	↑	\Pisymbol{astrosym}{207}
*	\Pisymbol{astrosym}{60}	↑↑	\Pisymbol{astrosym}{208}
△	\Pisymbol{astrosym}{61}	▷	\Pisymbol{astrosym}{209}
▣	\Pisymbol{astrosym}{62}	🕒	\Pisymbol{astrosym}{210}
➤	\Pisymbol{astrosym}{63}	▼	\Pisymbol{astrosym}{211}
❖	\Pisymbol{astrosym}{64}	❖	\Pisymbol{astrosym}{212}
❖	\Pisymbol{astrosym}{65}	❖	\Pisymbol{astrosym}{213}
❖	\Pisymbol{astrosym}{66}	⌚	\Pisymbol{astrosym}{214}
⌚	\Pisymbol{astrosym}{67}	⌚	\Pisymbol{astrosym}{215}
⌚	\Pisymbol{astrosym}{68}	⌚	\Pisymbol{astrosym}{216}
*	\Pisymbol{astrosym}{69}	⌚	\Pisymbol{astrosym}{217}
☺	\Pisymbol{astrosym}{90}	♏	\Pisymbol{astrosym}{218}
☻	\Pisymbol{astrosym}{91}	↗	\Pisymbol{astrosym}{219}
Ѡ	\Pisymbol{astrosym}{92}	Ѡ	\Pisymbol{astrosym}{220}
Ѡ	\Pisymbol{astrosym}{93}	Ѡ	\Pisymbol{astrosym}{221}
Ѡ	\Pisymbol{astrosym}{94}	Ѡ	\Pisymbol{astrosym}{222}
Ѡ	\Pisymbol{astrosym}{95}	Ѡ	\Pisymbol{astrosym}{223}
Ѡ	\Pisymbol{astrosym}{100}	⇅	\Pisymbol{astrosym}{224}
Ѡ	\Pisymbol{astrosym}{101}	⇅	\Pisymbol{astrosym}{225}
Ѡ	\Pisymbol{astrosym}{102}	⇅	\Pisymbol{astrosym}{226}
Ѡ	\Pisymbol{astrosym}{103}	≈	\Pisymbol{astrosym}{227}
Ѡ	\Pisymbol{astrosym}{104}	≈	\Pisymbol{astrosym}{228}
Ѡ	\Pisymbol{astrosym}{105}	⊕	\Pisymbol{astrosym}{229}
Ѡ	\Pisymbol{astrosym}{106}	♂	\Pisymbol{astrosym}{230}
Ѡ	\Pisymbol{astrosym}{107}	ᴾ	\Pisymbol{astrosym}{231}
ѿ	\Pisymbol{astrosym}{108}	□	\Pisymbol{astrosym}{232}
Ѽ	\Pisymbol{astrosym}{109}	*	\Pisymbol{astrosym}{233}
Ѽ	\Pisymbol{astrosym}{110}	Ѡ	\Pisymbol{astrosym}{234}
Ѽ	\Pisymbol{astrosym}{111}	↖	\Pisymbol{astrosym}{235}
Ѽ	\Pisymbol{astrosym}{112}	Ѡ	\Pisymbol{astrosym}{236}
Ѽ	\Pisymbol{astrosym}{113}	Ѡ	\Pisymbol{astrosym}{237}
Ѽ	\Pisymbol{astrosym}{114}	□	\Pisymbol{astrosym}{238}
Ѡ	\Pisymbol{astrosym}{115}	○	\Pisymbol{astrosym}{239}
Ѽ	\Pisymbol{astrosym}{116}	●	\Pisymbol{astrosym}{240}
Ѽ	\Pisymbol{astrosym}{117}	○	\Pisymbol{astrosym}{241}
Ѽ	\Pisymbol{astrosym}{118}	●	\Pisymbol{astrosym}{242}

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	\Pisymbol{astrosym}{119}		\Pisymbol{astrosym}{243}
	\Pisymbol{astrosym}{120}		\Pisymbol{astrosym}{244}
	\Pisymbol{astrosym}{121}		\Pisymbol{astrosym}{245}
	\Pisymbol{astrosym}{122}		\Pisymbol{astrosym}{246}
	\Pisymbol{astrosym}{123}		\Pisymbol{astrosym}{247}
	\Pisymbol{astrosym}{124}		\Pisymbol{astrosym}{248}
	\Pisymbol{astrosym}{125}		\Pisymbol{astrosym}{249}
	\Pisymbol{astrosym}{126}		\Pisymbol{astrosym}{250}
	\Pisymbol{astrosym}{127}		\Pisymbol{astrosym}{251}
	\Pisymbol{astrosym}{128}		\Pisymbol{astrosym}{252}
	\Pisymbol{astrosym}{129}		\Pisymbol{astrosym}{253}
	\Pisymbol{astrosym}{130}		\Pisymbol{astrosym}{254}
	\Pisymbol{astrosym}{131}		\Pisymbol{astrosym}{255}

TABLE 511: webomints Decorative Borders

	\Pisymbol{WebOMintsGD}{47}		\Pisymbol{WebOMintsGD}{87}
	\Pisymbol{WebOMintsGD}{48}		\Pisymbol{WebOMintsGD}{88}
	\Pisymbol{WebOMintsGD}{49}		\Pisymbol{WebOMintsGD}{89}
	\Pisymbol{WebOMintsGD}{50}		\Pisymbol{WebOMintsGD}{90}
	\Pisymbol{WebOMintsGD}{51}		\Pisymbol{WebOMintsGD}{91}
	\Pisymbol{WebOMintsGD}{52}		\Pisymbol{WebOMintsGD}{93}
	\Pisymbol{WebOMintsGD}{53}		\Pisymbol{WebOMintsGD}{97}
	\Pisymbol{WebOMintsGD}{54}		\Pisymbol{WebOMintsGD}{98}
	\Pisymbol{WebOMintsGD}{55}		\Pisymbol{WebOMintsGD}{99}
	\Pisymbol{WebOMintsGD}{56}		\Pisymbol{WebOMintsGD}{100}
	\Pisymbol{WebOMintsGD}{57}		\Pisymbol{WebOMintsGD}{101}
	\Pisymbol{WebOMintsGD}{65}		\Pisymbol{WebOMintsGD}{102}
	\Pisymbol{WebOMintsGD}{66}		\Pisymbol{WebOMintsGD}{103}
	\Pisymbol{WebOMintsGD}{67}		\Pisymbol{WebOMintsGD}{104}
	\Pisymbol{WebOMintsGD}{68}		\Pisymbol{WebOMintsGD}{105}
	\Pisymbol{WebOMintsGD}{69}		\Pisymbol{WebOMintsGD}{106}
	\Pisymbol{WebOMintsGD}{70}		\Pisymbol{WebOMintsGD}{107}
	\Pisymbol{WebOMintsGD}{71}		\Pisymbol{WebOMintsGD}{108}
	\Pisymbol{WebOMintsGD}{72}		\Pisymbol{WebOMintsGD}{109}
	\Pisymbol{WebOMintsGD}{73}		\Pisymbol{WebOMintsGD}{110}
	\Pisymbol{WebOMintsGD}{74}		\Pisymbol{WebOMintsGD}{111}
	\Pisymbol{WebOMintsGD}{75}		\Pisymbol{WebOMintsGD}{112}

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	\Pisymbol{WebOMintsGD}{76}		\Pisymbol{WebOMintsGD}{113}
	\Pisymbol{WebOMintsGD}{77}		\Pisymbol{WebOMintsGD}{114}
	\Pisymbol{WebOMintsGD}{78}		\Pisymbol{WebOMintsGD}{115}
	\Pisymbol{WebOMintsGD}{79}		\Pisymbol{WebOMintsGD}{116}
	\Pisymbol{WebOMintsGD}{80}		\Pisymbol{WebOMintsGD}{117}
	\Pisymbol{WebOMintsGD}{81}		\Pisymbol{WebOMintsGD}{118}
	\Pisymbol{WebOMintsGD}{82}		\Pisymbol{WebOMintsGD}{119}
	\Pisymbol{WebOMintsGD}{83}		\Pisymbol{WebOMintsGD}{120}
	\Pisymbol{WebOMintsGD}{84}		\Pisymbol{WebOMintsGD}{121}
	\Pisymbol{WebOMintsGD}{85}		\Pisymbol{WebOMintsGD}{122}
	\Pisymbol{WebOMintsGD}{86}		

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}{x1}{n}\char73\char74`—alternatively, `\usefont{U}{webo}{x1}{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 512: umranda Decorative Borders

	\Pisymbol{umranda}{0}		\Pisymbol{umranda}{34}		\Pisymbol{umranda}{68}
	\Pisymbol{umranda}{1}		\Pisymbol{umranda}{35}		\Pisymbol{umranda}{69}
	\Pisymbol{umranda}{2}		\Pisymbol{umranda}{36}		\Pisymbol{umranda}{70}
	\Pisymbol{umranda}{3}		\Pisymbol{umranda}{37}		\Pisymbol{umranda}{71}
	\Pisymbol{umranda}{4}		\Pisymbol{umranda}{38}		\Pisymbol{umranda}{72}
	\Pisymbol{umranda}{5}		\Pisymbol{umranda}{39}		\Pisymbol{umranda}{73}
	\Pisymbol{umranda}{6}		\Pisymbol{umranda}{40}		\Pisymbol{umranda}{74}
	\Pisymbol{umranda}{7}		\Pisymbol{umranda}{41}		\Pisymbol{umranda}{75}
	\Pisymbol{umranda}{8}		\Pisymbol{umranda}{42}		\Pisymbol{umranda}{76}
	\Pisymbol{umranda}{9}		\Pisymbol{umranda}{43}		\Pisymbol{umranda}{77}
	\Pisymbol{umranda}{10}		\Pisymbol{umranda}{44}		\Pisymbol{umranda}{78}
	\Pisymbol{umranda}{11}		\Pisymbol{umranda}{45}		\Pisymbol{umranda}{79}
	\Pisymbol{umranda}{12}		\Pisymbol{umranda}{46}		\Pisymbol{umranda}{80}
	\Pisymbol{umranda}{13}		\Pisymbol{umranda}{47}		\Pisymbol{umranda}{81}
	\Pisymbol{umranda}{14}		\Pisymbol{umranda}{48}		\Pisymbol{umranda}{82}

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	\Pisymbol{umranda}{15}		\Pisymbol{umranda}{49}		\Pisymbol{umranda}{83}
	\Pisymbol{umranda}{16}		\Pisymbol{umranda}{50}		\Pisymbol{umranda}{84}
	\Pisymbol{umranda}{17}		\Pisymbol{umranda}{51}		\Pisymbol{umranda}{85}
	\Pisymbol{umranda}{18}		\Pisymbol{umranda}{52}		\Pisymbol{umranda}{86}
	\Pisymbol{umranda}{19}		\Pisymbol{umranda}{53}		\Pisymbol{umranda}{87}
	\Pisymbol{umranda}{20}		\Pisymbol{umranda}{54}		\Pisymbol{umranda}{88}
	\Pisymbol{umranda}{21}		\Pisymbol{umranda}{55}		\Pisymbol{umranda}{89}
	\Pisymbol{umranda}{22}		\Pisymbol{umranda}{56}		\Pisymbol{umranda}{90}
	\Pisymbol{umranda}{23}		\Pisymbol{umranda}{57}		\Pisymbol{umranda}{91}
	\Pisymbol{umranda}{24}		\Pisymbol{umranda}{58}		\Pisymbol{umranda}{92}
	\Pisymbol{umranda}{25}		\Pisymbol{umranda}{59}		\Pisymbol{umranda}{93}
	\Pisymbol{umranda}{26}		\Pisymbol{umranda}{60}		\Pisymbol{umranda}{94}
	\Pisymbol{umranda}{27}		\Pisymbol{umranda}{61}		\Pisymbol{umranda}{95}
	\Pisymbol{umranda}{28}		\Pisymbol{umranda}{62}		\Pisymbol{umranda}{96}
	\Pisymbol{umranda}{29}		\Pisymbol{umranda}{63}		\Pisymbol{umranda}{97}
	\Pisymbol{umranda}{30}		\Pisymbol{umranda}{64}		\Pisymbol{umranda}{98}
	\Pisymbol{umranda}{31}		\Pisymbol{umranda}{65}		\Pisymbol{umranda}{99}
	\Pisymbol{umranda}{32}		\Pisymbol{umranda}{66}		\Pisymbol{umranda}{100}
	\Pisymbol{umranda}{33}		\Pisymbol{umranda}{67}		\Pisymbol{umranda}{101}

The niceframe package can be used to typeset decorative frames using fonts such as `umranda`.

TABLE 513: `umrandb` Decorative Borders

	\Pisymbol{umrandb}{0}		\Pisymbol{umrandb}{42}		\Pisymbol{umrandb}{84}
	\Pisymbol{umrandb}{1}		\Pisymbol{umrandb}{43}		\Pisymbol{umrandb}{85}
	\Pisymbol{umrandb}{2}		\Pisymbol{umrandb}{44}		\Pisymbol{umrandb}{86}
	\Pisymbol{umrandb}{3}		\Pisymbol{umrandb}{45}		\Pisymbol{umrandb}{87}
	\Pisymbol{umrandb}{4}		\Pisymbol{umrandb}{46}		\Pisymbol{umrandb}{88}
	\Pisymbol{umrandb}{5}		\Pisymbol{umrandb}{47}		\Pisymbol{umrandb}{89}
	\Pisymbol{umrandb}{6}		\Pisymbol{umrandb}{48}		\Pisymbol{umrandb}{90}
	\Pisymbol{umrandb}{7}		\Pisymbol{umrandb}{49}		\Pisymbol{umrandb}{91}
	\Pisymbol{umrandb}{8}		\Pisymbol{umrandb}{50}		\Pisymbol{umrandb}{92}
	\Pisymbol{umrandb}{9}		\Pisymbol{umrandb}{51}		\Pisymbol{umrandb}{93}

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⠼	\Pisymbol{umrandb}{10}	⠼	\Pisymbol{umrandb}{52}	⠼	\Pisymbol{umrandb}{94}
⠼	\Pisymbol{umrandb}{11}	⠼	\Pisymbol{umrandb}{53}	⠼	\Pisymbol{umrandb}{95}
⠼	\Pisymbol{umrandb}{12}	⠼	\Pisymbol{umrandb}{54}	⠼	\Pisymbol{umrandb}{96}
⠼	\Pisymbol{umrandb}{13}	⠼	\Pisymbol{umrandb}{55}	⠼	\Pisymbol{umrandb}{97}
⠼	\Pisymbol{umrandb}{14}	⠼	\Pisymbol{umrandb}{56}	⠼	\Pisymbol{umrandb}{98}
⠼	\Pisymbol{umrandb}{15}	⠼	\Pisymbol{umrandb}{57}	⠼	\Pisymbol{umrandb}{99}
⠼	\Pisymbol{umrandb}{16}	⠼	\Pisymbol{umrandb}{58}	⠼	\Pisymbol{umrandb}{100}
⠼	\Pisymbol{umrandb}{17}	⠼	\Pisymbol{umrandb}{59}	⠼	\Pisymbol{umrandb}{101}
⠼	\Pisymbol{umrandb}{18}	⠼	\Pisymbol{umrandb}{60}	⠼	\Pisymbol{umrandb}{102}
⠼	\Pisymbol{umrandb}{19}	⠼	\Pisymbol{umrandb}{61}	⠼	\Pisymbol{umrandb}{103}
⠼	\Pisymbol{umrandb}{20}	⠼	\Pisymbol{umrandb}{62}	⠼	\Pisymbol{umrandb}{104}
⠼	\Pisymbol{umrandb}{21}	⠼	\Pisymbol{umrandb}{63}	⠼	\Pisymbol{umrandb}{105}
⠼	\Pisymbol{umrandb}{22}	⠼	\Pisymbol{umrandb}{64}	⠼	\Pisymbol{umrandb}{106}
⠼	\Pisymbol{umrandb}{23}	⠼	\Pisymbol{umrandb}{65}	⠼	\Pisymbol{umrandb}{107}
⠼	\Pisymbol{umrandb}{24}	⠼	\Pisymbol{umrandb}{66}	⠼	\Pisymbol{umrandb}{108}
⠼	\Pisymbol{umrandb}{25}	⠼	\Pisymbol{umrandb}{67}	⠼	\Pisymbol{umrandb}{109}
⠼	\Pisymbol{umrandb}{26}	⠼	\Pisymbol{umrandb}{68}	⠼	\Pisymbol{umrandb}{110}
⠼	\Pisymbol{umrandb}{27}	⠼	\Pisymbol{umrandb}{69}	⠼	\Pisymbol{umrandb}{111}
⠼	\Pisymbol{umrandb}{28}	⠼	\Pisymbol{umrandb}{70}	⠼	\Pisymbol{umrandb}{112}
⠼	\Pisymbol{umrandb}{29}	⠼	\Pisymbol{umrandb}{71}	⠼	\Pisymbol{umrandb}{113}
⠼	\Pisymbol{umrandb}{30}	⠼	\Pisymbol{umrandb}{72}	⠼	\Pisymbol{umrandb}{114}
⠼	\Pisymbol{umrandb}{31}	⠼	\Pisymbol{umrandb}{73}	⠼	\Pisymbol{umrandb}{115}
⠼	\Pisymbol{umrandb}{32}	⠼	\Pisymbol{umrandb}{74}	⠼	\Pisymbol{umrandb}{116}
⠼	\Pisymbol{umrandb}{33}	⠼	\Pisymbol{umrandb}{75}	⠼	\Pisymbol{umrandb}{117}
⠼	\Pisymbol{umrandb}{34}	⠼	\Pisymbol{umrandb}{76}	⠼	\Pisymbol{umrandb}{118}
⠼	\Pisymbol{umrandb}{35}	⠼	\Pisymbol{umrandb}{77}	⠼	\Pisymbol{umrandb}{119}
⠼	\Pisymbol{umrandb}{36}	⠼	\Pisymbol{umrandb}{78}	⠼	\Pisymbol{umrandb}{120}
⠼	\Pisymbol{umrandb}{37}	⠼	\Pisymbol{umrandb}{79}	⠼	\Pisymbol{umrandb}{121}
⠼	\Pisymbol{umrandb}{38}	⠼	\Pisymbol{umrandb}{80}	⠼	\Pisymbol{umrandb}{122}
⠼	\Pisymbol{umrandb}{39}	⠼	\Pisymbol{umrandb}{81}	⠼	\Pisymbol{umrandb}{123}
⠼	\Pisymbol{umrandb}{40}	⠼	\Pisymbol{umrandb}{82}		
⠼	\Pisymbol{umrandb}{41}	⠼	\Pisymbol{umrandb}{83}		

The niceframe package can be used to typeset decorative frames using fonts such as `umrandb`.

TABLE 514: `dingbat` Decorative Borders

	\Pisymbol{dingbat}{69}		\Pisymbol{dingbat}{97}
	\Pisymbol{dingbat}{70}		\Pisymbol{dingbat}{98}
	\Pisymbol{dingbat}{71}		\Pisymbol{dingbat}{99}
	\Pisymbol{dingbat}{72}		\Pisymbol{dingbat}{100}
	\Pisymbol{dingbat}{74}		\Pisymbol{dingbat}{101}
	\Pisymbol{dingbat}{75}		\Pisymbol{dingbat}{102}
	\Pisymbol{dingbat}{76}		\Pisymbol{dingbat}{103}
	\Pisymbol{dingbat}{77}		\Pisymbol{dingbat}{104}

The preceding table is incomplete in that it includes only unnamed `dingbat` symbols. Named symbols are included in Table 352 and Table 396 (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 Section 9.

The `niceframe` package can be used to typeset decorative frames using fonts such as `dingbat`.

TABLE 515: `knot` Celtic Knots

	\Pisymbol{knot1}{48}		\Pisymbol{knot1}{68}		\Pisymbol{knot1}{84}
	\Pisymbol{knot1}{49}		\Pisymbol{knot1}{69}		\Pisymbol{knot1}{85}
	\Pisymbol{knot1}{50}		\Pisymbol{knot1}{70}		\Pisymbol{knot1}{86}
◆	\Pisymbol{knot1}{51}		\Pisymbol{knot1}{71}		\Pisymbol{knot1}{87}
●	\Pisymbol{knot1}{52}		\Pisymbol{knot1}{72}		\Pisymbol{knot1}{88}
	\Pisymbol{knot1}{53}		\Pisymbol{knot1}{73}		\Pisymbol{knot1}{96}
	\Pisymbol{knot1}{58}		\Pisymbol{knot1}{74}		\Pisymbol{knot1}{97}

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	\Pisymbol{knot1}{59}		\Pisymbol{knot1}{75}		\Pisymbol{knot1}{98}
	\Pisymbol{knot1}{60}		\Pisymbol{knot1}{76}		\Pisymbol{knot1}{99}
	\Pisymbol{knot1}{61}		\Pisymbol{knot1}{77}		\Pisymbol{knot1}{100}
	\Pisymbol{knot1}{62}		\Pisymbol{knot1}{78}		\Pisymbol{knot1}{101}
	\Pisymbol{knot1}{63}		\Pisymbol{knot1}{79}		\Pisymbol{knot1}{102}
	\Pisymbol{knot1}{64}		\Pisymbol{knot1}{80}		\Pisymbol{knot1}{103}
	\Pisymbol{knot1}{65}		\Pisymbol{knot1}{81}		\Pisymbol{knot1}{104}
	\Pisymbol{knot1}{66}		\Pisymbol{knot1}{82}		\Pisymbol{knot1}{105}
	\Pisymbol{knot1}{67}		\Pisymbol{knot1}{83}		
	\Pisymbol{knot2}{48}		\Pisymbol{knot2}{68}		\Pisymbol{knot2}{84}
	\Pisymbol{knot2}{49}		\Pisymbol{knot2}{69}		\Pisymbol{knot2}{85}
	\Pisymbol{knot2}{50}		\Pisymbol{knot2}{70}		\Pisymbol{knot2}{86}
◆	\Pisymbol{knot2}{51}		\Pisymbol{knot2}{71}		\Pisymbol{knot2}{87}
●	\Pisymbol{knot2}{52}		\Pisymbol{knot2}{72}		\Pisymbol{knot2}{88}
	\Pisymbol{knot2}{53}		\Pisymbol{knot2}{73}		\Pisymbol{knot2}{96}
	\Pisymbol{knot2}{58}		\Pisymbol{knot2}{74}		\Pisymbol{knot2}{97}
	\Pisymbol{knot2}{59}		\Pisymbol{knot2}{75}		\Pisymbol{knot2}{98}
	\Pisymbol{knot2}{60}		\Pisymbol{knot2}{76}		\Pisymbol{knot2}{99}
	\Pisymbol{knot2}{61}		\Pisymbol{knot2}{77}		\Pisymbol{knot2}{100}
	\Pisymbol{knot2}{62}		\Pisymbol{knot2}{78}		\Pisymbol{knot2}{101}
	\Pisymbol{knot2}{63}		\Pisymbol{knot2}{79}		\Pisymbol{knot2}{102}
	\Pisymbol{knot2}{64}		\Pisymbol{knot2}{80}		\Pisymbol{knot2}{103}
	\Pisymbol{knot2}{65}		\Pisymbol{knot2}{81}		\Pisymbol{knot2}{104}
	\Pisymbol{knot2}{66}		\Pisymbol{knot2}{82}		\Pisymbol{knot2}{105}
	\Pisymbol{knot2}{67}		\Pisymbol{knot2}{83}		
	\Pisymbol{knot3}{48}		\Pisymbol{knot3}{68}		\Pisymbol{knot3}{84}
	\Pisymbol{knot3}{49}		\Pisymbol{knot3}{69}		\Pisymbol{knot3}{85}
	\Pisymbol{knot3}{50}		\Pisymbol{knot3}{70}		\Pisymbol{knot3}{86}
◆	\Pisymbol{knot3}{51}		\Pisymbol{knot3}{71}		\Pisymbol{knot3}{87}
●	\Pisymbol{knot3}{52}		\Pisymbol{knot3}{72}		\Pisymbol{knot3}{88}
	\Pisymbol{knot3}{53}		\Pisymbol{knot3}{73}		\Pisymbol{knot3}{96}
	\Pisymbol{knot3}{58}		\Pisymbol{knot3}{74}		\Pisymbol{knot3}{97}
	\Pisymbol{knot3}{59}		\Pisymbol{knot3}{75}		\Pisymbol{knot3}{98}
	\Pisymbol{knot3}{60}		\Pisymbol{knot3}{76}		\Pisymbol{knot3}{99}
	\Pisymbol{knot3}{61}		\Pisymbol{knot3}{77}		\Pisymbol{knot3}{100}

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\Pisymbol{knot3}{62}		\Pisymbol{knot3}{78}		\Pisymbol{knot3}{101}
\Pisymbol{knot3}{63}		\Pisymbol{knot3}{79}		\Pisymbol{knot3}{102}
\Pisymbol{knot3}{64}		\Pisymbol{knot3}{80}		\Pisymbol{knot3}{103}
\Pisymbol{knot3}{65}		\Pisymbol{knot3}{81}		\Pisymbol{knot3}{104}
\Pisymbol{knot3}{66}		\Pisymbol{knot3}{82}		\Pisymbol{knot3}{105}
\Pisymbol{knot3}{67}		\Pisymbol{knot3}{83}		
\Pisymbol{knot4}{48}		\Pisymbol{knot4}{68}		\Pisymbol{knot4}{84}
\Pisymbol{knot4}{49}		\Pisymbol{knot4}{69}		\Pisymbol{knot4}{85}
\Pisymbol{knot4}{50}		\Pisymbol{knot4}{70}		\Pisymbol{knot4}{86}
◆	\Pisymbol{knot4}{51}	\Pisymbol{knot4}{71}		\Pisymbol{knot4}{87}
●	\Pisymbol{knot4}{52}	\Pisymbol{knot4}{72}		\Pisymbol{knot4}{88}
□	\Pisymbol{knot4}{53}	\Pisymbol{knot4}{73}		\Pisymbol{knot4}{96}
□	\Pisymbol{knot4}{58}	\Pisymbol{knot4}{74}		\Pisymbol{knot4}{97}
□	\Pisymbol{knot4}{59}	\Pisymbol{knot4}{75}		\Pisymbol{knot4}{98}
□	\Pisymbol{knot4}{60}	\Pisymbol{knot4}{76}		\Pisymbol{knot4}{99}
□	\Pisymbol{knot4}{61}	\Pisymbol{knot4}{77}		\Pisymbol{knot4}{100}
□	\Pisymbol{knot4}{62}	\Pisymbol{knot4}{78}		\Pisymbol{knot4}{101}
□	\Pisymbol{knot4}{63}	\Pisymbol{knot4}{79}		\Pisymbol{knot4}{102}
□	\Pisymbol{knot4}{64}	\Pisymbol{knot4}{80}		\Pisymbol{knot4}{103}
□	\Pisymbol{knot4}{65}	\Pisymbol{knot4}{81}		\Pisymbol{knot4}{104}
□	\Pisymbol{knot4}{66}	\Pisymbol{knot4}{82}		\Pisymbol{knot4}{105}
□	\Pisymbol{knot4}{67}	\Pisymbol{knot4}{83}		
\Pisymbol{knot5}{48}		\Pisymbol{knot5}{68}		\Pisymbol{knot5}{84}
\Pisymbol{knot5}{49}		\Pisymbol{knot5}{69}		\Pisymbol{knot5}{85}
\Pisymbol{knot5}{50}		\Pisymbol{knot5}{70}		\Pisymbol{knot5}{86}
◆	\Pisymbol{knot5}{51}	\Pisymbol{knot5}{71}		\Pisymbol{knot5}{87}
●	\Pisymbol{knot5}{52}	\Pisymbol{knot5}{72}		\Pisymbol{knot5}{88}
□	\Pisymbol{knot5}{53}	\Pisymbol{knot5}{73}		\Pisymbol{knot5}{96}
□	\Pisymbol{knot5}{58}	\Pisymbol{knot5}{74}		\Pisymbol{knot5}{97}
□	\Pisymbol{knot5}{59}	\Pisymbol{knot5}{75}		\Pisymbol{knot5}{98}
□	\Pisymbol{knot5}{60}	\Pisymbol{knot5}{76}		\Pisymbol{knot5}{99}
□	\Pisymbol{knot5}{61}	\Pisymbol{knot5}{77}		\Pisymbol{knot5}{100}
□	\Pisymbol{knot5}{62}	\Pisymbol{knot5}{78}		\Pisymbol{knot5}{101}
□	\Pisymbol{knot5}{63}	\Pisymbol{knot5}{79}		\Pisymbol{knot5}{102}
□	\Pisymbol{knot5}{64}	\Pisymbol{knot5}{80}		\Pisymbol{knot5}{103}

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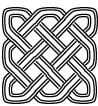
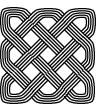
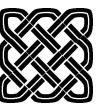
	\Pisymbol{knot5}{65}		\Pisymbol{knot5}{81}		\Pisymbol{knot5}{104}
	\Pisymbol{knot5}{66}		\Pisymbol{knot5}{82}		\Pisymbol{knot5}{105}
	\Pisymbol{knot5}{67}		\Pisymbol{knot5}{83}		
	\Pisymbol{knot6}{48}		\Pisymbol{knot6}{68}		\Pisymbol{knot6}{84}
	\Pisymbol{knot6}{49}		\Pisymbol{knot6}{69}		\Pisymbol{knot6}{85}
	\Pisymbol{knot6}{50}		\Pisymbol{knot6}{70}		\Pisymbol{knot6}{86}
◆	\Pisymbol{knot6}{51}		\Pisymbol{knot6}{71}		\Pisymbol{knot6}{87}
●	\Pisymbol{knot6}{52}		\Pisymbol{knot6}{72}		\Pisymbol{knot6}{88}
	\Pisymbol{knot6}{53}		\Pisymbol{knot6}{73}		\Pisymbol{knot6}{96}
	\Pisymbol{knot6}{58}		\Pisymbol{knot6}{74}		\Pisymbol{knot6}{97}
	\Pisymbol{knot6}{59}		\Pisymbol{knot6}{75}		\Pisymbol{knot6}{98}
	\Pisymbol{knot6}{60}		\Pisymbol{knot6}{76}		\Pisymbol{knot6}{99}
	\Pisymbol{knot6}{61}		\Pisymbol{knot6}{77}		\Pisymbol{knot6}{100}
	\Pisymbol{knot6}{62}		\Pisymbol{knot6}{78}		\Pisymbol{knot6}{101}
	\Pisymbol{knot6}{63}		\Pisymbol{knot6}{79}		\Pisymbol{knot6}{102}
	\Pisymbol{knot6}{64}		\Pisymbol{knot6}{80}		\Pisymbol{knot6}{103}
	\Pisymbol{knot6}{65}		\Pisymbol{knot6}{81}		\Pisymbol{knot6}{104}
	\Pisymbol{knot6}{66}		\Pisymbol{knot6}{82}		\Pisymbol{knot6}{105}
	\Pisymbol{knot6}{67}		\Pisymbol{knot6}{83}		
	\Pisymbol{knot7}{48}		\Pisymbol{knot7}{68}		\Pisymbol{knot7}{84}
	\Pisymbol{knot7}{49}		\Pisymbol{knot7}{69}		\Pisymbol{knot7}{85}
	\Pisymbol{knot7}{50}		\Pisymbol{knot7}{70}		\Pisymbol{knot7}{86}
◆	\Pisymbol{knot7}{51}		\Pisymbol{knot7}{71}		\Pisymbol{knot7}{87}
●	\Pisymbol{knot7}{52}		\Pisymbol{knot7}{72}		\Pisymbol{knot7}{88}
	\Pisymbol{knot7}{53}		\Pisymbol{knot7}{73}		\Pisymbol{knot7}{96}
	\Pisymbol{knot7}{58}		\Pisymbol{knot7}{74}		\Pisymbol{knot7}{97}
	\Pisymbol{knot7}{59}		\Pisymbol{knot7}{75}		\Pisymbol{knot7}{98}
	\Pisymbol{knot7}{60}		\Pisymbol{knot7}{76}		\Pisymbol{knot7}{99}
	\Pisymbol{knot7}{61}		\Pisymbol{knot7}{77}		\Pisymbol{knot7}{100}
	\Pisymbol{knot7}{62}		\Pisymbol{knot7}{78}		\Pisymbol{knot7}{101}
	\Pisymbol{knot7}{63}		\Pisymbol{knot7}{79}		\Pisymbol{knot7}{102}
	\Pisymbol{knot7}{64}		\Pisymbol{knot7}{80}		\Pisymbol{knot7}{103}
	\Pisymbol{knot7}{65}		\Pisymbol{knot7}{81}		\Pisymbol{knot7}{104}
	\Pisymbol{knot7}{66}		\Pisymbol{knot7}{82}		\Pisymbol{knot7}{105}

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 \Pisymbol{knot7}{67}  \Pisymbol{knot7}{83}

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							
CEA							

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 516: dancers Dancing Men

 \Pisymbol{dancers}{0}	 \Pisymbol{dancers}{86}	 \Pisymbol{dancers}{172}
 \Pisymbol{dancers}{1}	 \Pisymbol{dancers}{87}	 \Pisymbol{dancers}{173}
 \Pisymbol{dancers}{2}	 \Pisymbol{dancers}{88}	 \Pisymbol{dancers}{174}
 \Pisymbol{dancers}{3}	 \Pisymbol{dancers}{89}	 \Pisymbol{dancers}{175}
 \Pisymbol{dancers}{4}	 \Pisymbol{dancers}{90}	 \Pisymbol{dancers}{176}
 \Pisymbol{dancers}{5}	 \Pisymbol{dancers}{91}	 \Pisymbol{dancers}{177}
 \Pisymbol{dancers}{6}	 \Pisymbol{dancers}{92}	 \Pisymbol{dancers}{178}
 \Pisymbol{dancers}{7}	 \Pisymbol{dancers}{93}	 \Pisymbol{dancers}{179}
 \Pisymbol{dancers}{8}	 \Pisymbol{dancers}{94}	 \Pisymbol{dancers}{180}
 \Pisymbol{dancers}{9}	 \Pisymbol{dancers}{95}	 \Pisymbol{dancers}{181}
 \Pisymbol{dancers}{10}	 \Pisymbol{dancers}{96}	 \Pisymbol{dancers}{182}
 \Pisymbol{dancers}{11}	 \Pisymbol{dancers}{97}	 \Pisymbol{dancers}{183}
 \Pisymbol{dancers}{12}	 \Pisymbol{dancers}{98}	 \Pisymbol{dancers}{184}
 \Pisymbol{dancers}{13}	 \Pisymbol{dancers}{99}	 \Pisymbol{dancers}{185}
 \Pisymbol{dancers}{14}	 \Pisymbol{dancers}{100}	 \Pisymbol{dancers}{186}
 \Pisymbol{dancers}{15}	 \Pisymbol{dancers}{101}	 \Pisymbol{dancers}{187}
 \Pisymbol{dancers}{16}	 \Pisymbol{dancers}{102}	 \Pisymbol{dancers}{188}

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\Pisymbol{dancers}{17}	\Pisymbol{dancers}{103}	\Pisymbol{dancers}{189}
\Pisymbol{dancers}{18}	\Pisymbol{dancers}{104}	\Pisymbol{dancers}{190}
\Pisymbol{dancers}{19}	\Pisymbol{dancers}{105}	\Pisymbol{dancers}{191}
\Pisymbol{dancers}{20}	\Pisymbol{dancers}{106}	\Pisymbol{dancers}{192}
\Pisymbol{dancers}{21}	\Pisymbol{dancers}{107}	\Pisymbol{dancers}{193}
\Pisymbol{dancers}{22}	\Pisymbol{dancers}{108}	\Pisymbol{dancers}{194}
\Pisymbol{dancers}{23}	\Pisymbol{dancers}{109}	\Pisymbol{dancers}{195}
\Pisymbol{dancers}{24}	\Pisymbol{dancers}{110}	\Pisymbol{dancers}{196}
\Pisymbol{dancers}{25}	\Pisymbol{dancers}{111}	\Pisymbol{dancers}{197}
\Pisymbol{dancers}{26}	\Pisymbol{dancers}{112}	\Pisymbol{dancers}{198}
\Pisymbol{dancers}{27}	\Pisymbol{dancers}{113}	\Pisymbol{dancers}{199}
\Pisymbol{dancers}{28}	\Pisymbol{dancers}{114}	\Pisymbol{dancers}{200}
\Pisymbol{dancers}{29}	\Pisymbol{dancers}{115}	\Pisymbol{dancers}{201}
\Pisymbol{dancers}{30}	\Pisymbol{dancers}{116}	\Pisymbol{dancers}{202}
\Pisymbol{dancers}{31}	\Pisymbol{dancers}{117}	\Pisymbol{dancers}{203}
\Pisymbol{dancers}{32}	\Pisymbol{dancers}{118}	\Pisymbol{dancers}{204}
\Pisymbol{dancers}{33}	\Pisymbol{dancers}{119}	\Pisymbol{dancers}{205}
\Pisymbol{dancers}{34}	\Pisymbol{dancers}{120}	\Pisymbol{dancers}{206}
\Pisymbol{dancers}{35}	\Pisymbol{dancers}{121}	\Pisymbol{dancers}{207}
\Pisymbol{dancers}{36}	\Pisymbol{dancers}{122}	\Pisymbol{dancers}{208}
\Pisymbol{dancers}{37}	\Pisymbol{dancers}{123}	\Pisymbol{dancers}{209}
\Pisymbol{dancers}{38}	\Pisymbol{dancers}{124}	\Pisymbol{dancers}{210}
\Pisymbol{dancers}{39}	\Pisymbol{dancers}{125}	\Pisymbol{dancers}{211}
\Pisymbol{dancers}{40}	\Pisymbol{dancers}{126}	\Pisymbol{dancers}{212}
\Pisymbol{dancers}{41}	\Pisymbol{dancers}{127}	\Pisymbol{dancers}{213}
\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}

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\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}
\Pisymbol{dancers}{60}	\Pisymbol{dancers}{146}	\Pisymbol{dancers}{232}
\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}
\Pisymbol{dancers}{72}	\Pisymbol{dancers}{158}	\Pisymbol{dancers}{244}
\Pisymbol{dancers}{73}	\Pisymbol{dancers}{159}	\Pisymbol{dancers}{245}
\Pisymbol{dancers}{74}	\Pisymbol{dancers}{160}	\Pisymbol{dancers}{246}
\Pisymbol{dancers}{75}	\Pisymbol{dancers}{161}	\Pisymbol{dancers}{247}
\Pisymbol{dancers}{76}	\Pisymbol{dancers}{162}	\Pisymbol{dancers}{248}
\Pisymbol{dancers}{77}	\Pisymbol{dancers}{163}	\Pisymbol{dancers}{249}
\Pisymbol{dancers}{78}	\Pisymbol{dancers}{164}	\Pisymbol{dancers}{250}
\Pisymbol{dancers}{79}	\Pisymbol{dancers}{165}	\Pisymbol{dancers}{251}
\Pisymbol{dancers}{80}	\Pisymbol{dancers}{166}	\Pisymbol{dancers}{252}

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\Pisymbol{dancers}{81}	\Pisymbol{dancers}{167}	\Pisymbol{dancers}{253}
\Pisymbol{dancers}{82}	\Pisymbol{dancers}{168}	\Pisymbol{dancers}{254}
\Pisymbol{dancers}{83}	\Pisymbol{dancers}{169}	\Pisymbol{dancers}{255}
\Pisymbol{dancers}{84}	\Pisymbol{dancers}{170}	
\Pisymbol{dancers}{85}	\Pisymbol{dancers}{171}	

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 517: semaphor Semaphore Alphabet

\Pisymbol{smfpr10}{34}	\Pisymbol{smfpr10}{116}	\Pisymbol{smfpr10}{184}
\Pisymbol{smfpr10}{35}	\Pisymbol{smfpr10}{117}	\Pisymbol{smfpr10}{185}
\Pisymbol{smfpr10}{36}	\Pisymbol{smfpr10}{118}	\Pisymbol{smfpr10}{186}
\Pisymbol{smfpr10}{42}	\Pisymbol{smfpr10}{119}	\Pisymbol{smfpr10}{187}
\Pisymbol{smfpr10}{46}	\Pisymbol{smfpr10}{120}	\Pisymbol{smfpr10}{192}
\Pisymbol{smfpr10}{48}	\Pisymbol{smfpr10}{121}	\Pisymbol{smfpr10}{193}
\Pisymbol{smfpr10}{49}	\Pisymbol{smfpr10}{122}	\Pisymbol{smfpr10}{194}
\Pisymbol{smfpr10}{50}	\Pisymbol{smfpr10}{126}	\Pisymbol{smfpr10}{195}
\Pisymbol{smfpr10}{51}	\Pisymbol{smfpr10}{128}	\Pisymbol{smfpr10}{196}
\Pisymbol{smfpr10}{52}	\Pisymbol{smfpr10}{129}	\Pisymbol{smfpr10}{197}
\Pisymbol{smfpr10}{53}	\Pisymbol{smfpr10}{130}	\Pisymbol{smfpr10}{199}
\Pisymbol{smfpr10}{54}	\Pisymbol{smfpr10}{131}	\Pisymbol{smfpr10}{200}
\Pisymbol{smfpr10}{55}	\Pisymbol{smfpr10}{132}	\Pisymbol{smfpr10}{201}
\Pisymbol{smfpr10}{56}	\Pisymbol{smfpr10}{133}	\Pisymbol{smfpr10}{202}
\Pisymbol{smfpr10}{57}	\Pisymbol{smfpr10}{134}	\Pisymbol{smfpr10}{203}
\Pisymbol{smfpr10}{65}	\Pisymbol{smfpr10}{135}	\Pisymbol{smfpr10}{204}
\Pisymbol{smfpr10}{66}	\Pisymbol{smfpr10}{136}	\Pisymbol{smfpr10}{205}
\Pisymbol{smfpr10}{67}	\Pisymbol{smfpr10}{137}	\Pisymbol{smfpr10}{206}
\Pisymbol{smfpr10}{68}	\Pisymbol{smfpr10}{138}	\Pisymbol{smfpr10}{207}
\Pisymbol{smfpr10}{69}	\Pisymbol{smfpr10}{139}	\Pisymbol{smfpr10}{209}
\Pisymbol{smfpr10}{70}	\Pisymbol{smfpr10}{140}	\Pisymbol{smfpr10}{210}
\Pisymbol{smfpr10}{71}	\Pisymbol{smfpr10}{142}	\Pisymbol{smfpr10}{211}
\Pisymbol{smfpr10}{72}	\Pisymbol{smfpr10}{143}	\Pisymbol{smfpr10}{212}
\Pisymbol{smfpr10}{73}	\Pisymbol{smfpr10}{144}	\Pisymbol{smfpr10}{213}
\Pisymbol{smfpr10}{74}	\Pisymbol{smfpr10}{145}	\Pisymbol{smfpr10}{214}
\Pisymbol{smfpr10}{75}	\Pisymbol{smfpr10}{146}	\Pisymbol{smfpr10}{216}
\Pisymbol{smfpr10}{76}	\Pisymbol{smfpr10}{147}	\Pisymbol{smfpr10}{217}
\Pisymbol{smfpr10}{77}	\Pisymbol{smfpr10}{148}	\Pisymbol{smfpr10}{218}

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\Pisymbol{smfpr10}{78}	\Pisymbol{smfpr10}{149}	\Pisymbol{smfpr10}{219}
\Pisymbol{smfpr10}{79}	\Pisymbol{smfpr10}{150}	\Pisymbol{smfpr10}{220}
\Pisymbol{smfpr10}{80}	\Pisymbol{smfpr10}{151}	\Pisymbol{smfpr10}{221}
\Pisymbol{smfpr10}{81}	\Pisymbol{smfpr10}{152}	\Pisymbol{smfpr10}{224}
\Pisymbol{smfpr10}{82}	\Pisymbol{smfpr10}{153}	\Pisymbol{smfpr10}{225}
\Pisymbol{smfpr10}{83}	\Pisymbol{smfpr10}{154}	\Pisymbol{smfpr10}{226}
\Pisymbol{smfpr10}{84}	\Pisymbol{smfpr10}{155}	\Pisymbol{smfpr10}{227}
\Pisymbol{smfpr10}{85}	\Pisymbol{smfpr10}{157}	\Pisymbol{smfpr10}{228}
\Pisymbol{smfpr10}{86}	\Pisymbol{smfpr10}{158}	\Pisymbol{smfpr10}{229}
\Pisymbol{smfpr10}{87}	\Pisymbol{smfpr10}{160}	\Pisymbol{smfpr10}{231}
\Pisymbol{smfpr10}{88}	\Pisymbol{smfpr10}{161}	\Pisymbol{smfpr10}{232}
\Pisymbol{smfpr10}{89}	\Pisymbol{smfpr10}{162}	\Pisymbol{smfpr10}{233}
\Pisymbol{smfpr10}{90}	\Pisymbol{smfpr10}{163}	\Pisymbol{smfpr10}{234}
\Pisymbol{smfpr10}{97}	\Pisymbol{smfpr10}{164}	\Pisymbol{smfpr10}{235}
\Pisymbol{smfpr10}{98}	\Pisymbol{smfpr10}{165}	\Pisymbol{smfpr10}{236}
\Pisymbol{smfpr10}{99}	\Pisymbol{smfpr10}{166}	\Pisymbol{smfpr10}{237}
\Pisymbol{smfpr10}{100}	\Pisymbol{smfpr10}{167}	\Pisymbol{smfpr10}{238}
\Pisymbol{smfpr10}{101}	\Pisymbol{smfpr10}{168}	\Pisymbol{smfpr10}{239}
\Pisymbol{smfpr10}{102}	\Pisymbol{smfpr10}{169}	\Pisymbol{smfpr10}{241}
\Pisymbol{smfpr10}{103}	\Pisymbol{smfpr10}{170}	\Pisymbol{smfpr10}{242}
\Pisymbol{smfpr10}{104}	\Pisymbol{smfpr10}{171}	\Pisymbol{smfpr10}{243}
\Pisymbol{smfpr10}{105}	\Pisymbol{smfpr10}{172}	\Pisymbol{smfpr10}{244}
\Pisymbol{smfpr10}{106}	\Pisymbol{smfpr10}{174}	\Pisymbol{smfpr10}{245}
\Pisymbol{smfpr10}{107}	\Pisymbol{smfpr10}{175}	\Pisymbol{smfpr10}{246}
\Pisymbol{smfpr10}{108}	\Pisymbol{smfpr10}{176}	\Pisymbol{smfpr10}{248}
\Pisymbol{smfpr10}{109}	\Pisymbol{smfpr10}{177}	\Pisymbol{smfpr10}{249}
\Pisymbol{smfpr10}{110}	\Pisymbol{smfpr10}{178}	\Pisymbol{smfpr10}{250}
\Pisymbol{smfpr10}{111}	\Pisymbol{smfpr10}{179}	\Pisymbol{smfpr10}{251}
\Pisymbol{smfpr10}{112}	\Pisymbol{smfpr10}{180}	\Pisymbol{smfpr10}{252}
\Pisymbol{smfpr10}{113}	\Pisymbol{smfpr10}{181}	\Pisymbol{smfpr10}{253}
\Pisymbol{smfpr10}{114}	\Pisymbol{smfpr10}{182}	
\Pisymbol{smfpr10}{115}	\Pisymbol{smfpr10}{183}	

`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 518: cryst Crystallography Symbols

◦	\Pisymbol{cryst}{0}	◆	\Pisymbol{cryst}{63}	◀	\Pisymbol{cryst}{138}
◆	\Pisymbol{cryst}{2}	◆	\Pisymbol{cryst}{64}	◀	\Pisymbol{cryst}{139}
▲	\Pisymbol{cryst}{3}	◆	\Pisymbol{cryst}{65}	■	\Pisymbol{cryst}{140}
◆	\Pisymbol{cryst}{4}	◆	\Pisymbol{cryst}{66}	▶	\Pisymbol{cryst}{141}
→	\Pisymbol{cryst}{5}	↖	\Pisymbol{cryst}{75}	◀	\Pisymbol{cryst}{142}
●	\Pisymbol{cryst}{6}	↖	\Pisymbol{cryst}{77}	▶	\Pisymbol{cryst}{143}
→	\Pisymbol{cryst}{7}	↖	\Pisymbol{cryst}{78}	↗	\Pisymbol{cryst}{145}
→	\Pisymbol{cryst}{8}	↖	\Pisymbol{cryst}{79}	↙	\Pisymbol{cryst}{147}
→	\Pisymbol{cryst}{9}	↖	\Pisymbol{cryst}{80}	↙	\Pisymbol{cryst}{148}
◦	\Pisymbol{cryst}{10}	↖	\Pisymbol{cryst}{81}	↙	\Pisymbol{cryst}{149}
◊	\Pisymbol{cryst}{12}	↖	\Pisymbol{cryst}{82}	↑	\Pisymbol{cryst}{155}
◆	\Pisymbol{cryst}{15}	↖	\Pisymbol{cryst}{83}	↓	\Pisymbol{cryst}{157}
◆	\Pisymbol{cryst}{20}	↖	\Pisymbol{cryst}{84}	↓	\Pisymbol{cryst}{158}
◆	\Pisymbol{cryst}{21}	↖	\Pisymbol{cryst}{85}	↓	\Pisymbol{cryst}{159}
◆	\Pisymbol{cryst}{22}	↖	\Pisymbol{cryst}{87}	↖	\Pisymbol{cryst}{175}
◆	\Pisymbol{cryst}{24}	↖	\Pisymbol{cryst}{88}	↖	\Pisymbol{cryst}{177}
↗	\Pisymbol{cryst}{25}	↖	\Pisymbol{cryst}{89}	↖	\Pisymbol{cryst}{178}
↗	\Pisymbol{cryst}{27}	↖	\Pisymbol{cryst}{95}	↖	\Pisymbol{cryst}{179}
↗	\Pisymbol{cryst}{28}	↖	\Pisymbol{cryst}{97}	↖	\Pisymbol{cryst}{185}
↗	\Pisymbol{cryst}{29}	↖	\Pisymbol{cryst}{98}	↖	\Pisymbol{cryst}{187}
▲	\Pisymbol{cryst}{30}	↖	\Pisymbol{cryst}{99}	↖	\Pisymbol{cryst}{188}
▲	\Pisymbol{cryst}{31}	◆	\Pisymbol{cryst}{102}	↖	\Pisymbol{cryst}{189}
▲	\Pisymbol{cryst}{32}	◆	\Pisymbol{cryst}{103}	↖	\Pisymbol{cryst}{195}
↗	\Pisymbol{cryst}{35}	▶	\Pisymbol{cryst}{104}	↖	\Pisymbol{cryst}{197}
●	\Pisymbol{cryst}{36}	◀	\Pisymbol{cryst}{105}	↖	\Pisymbol{cryst}{198}
↗	\Pisymbol{cryst}{37}	◀	\Pisymbol{cryst}{107}	↖	\Pisymbol{cryst}{199}
↗	\Pisymbol{cryst}{38}	◀	\Pisymbol{cryst}{108}	◆	\Pisymbol{cryst}{202}
↗	\Pisymbol{cryst}{39}	◀	\Pisymbol{cryst}{109}	◀	\Pisymbol{cryst}{203}
◆	\Pisymbol{cryst}{40}	◆	\Pisymbol{cryst}{112}	◀	\Pisymbol{cryst}{204}
◆	\Pisymbol{cryst}{41}	◀	\Pisymbol{cryst}{113}	◆	\Pisymbol{cryst}{210}
◆	\Pisymbol{cryst}{42}	◆	\Pisymbol{cryst}{120}	◆	\Pisymbol{cryst}{212}
◆	\Pisymbol{cryst}{43}	◆	\Pisymbol{cryst}{121}	◀	\Pisymbol{cryst}{213}
■	\Pisymbol{cryst}{44}	◀	\Pisymbol{cryst}{123}	◆	\Pisymbol{cryst}{220}
↗	\Pisymbol{cryst}{45}	▶	\Pisymbol{cryst}{124}	◆	\Pisymbol{cryst}{221}
↗	\Pisymbol{cryst}{47}	▶	\Pisymbol{cryst}{125}	◀	\Pisymbol{cryst}{223}
↗	\Pisymbol{cryst}{48}	▶	\Pisymbol{cryst}{127}	◀	\Pisymbol{cryst}{224}
↗	\Pisymbol{cryst}{49}	◀	\Pisymbol{cryst}{128}	◦	\Pisymbol{cryst}{230}
◆	\Pisymbol{cryst}{50}	◀	\Pisymbol{cryst}{129}	◆	\Pisymbol{cryst}{231}
↑	\Pisymbol{cryst}{55}	◀	\Pisymbol{cryst}{130}	◆	\Pisymbol{cryst}{232}
↑	\Pisymbol{cryst}{57}	◀	\Pisymbol{cryst}{131}	◀	\Pisymbol{cryst}{233}
↑	\Pisymbol{cryst}{58}	◀	\Pisymbol{cryst}{132}	◆	\Pisymbol{cryst}{236}
↑	\Pisymbol{cryst}{59}	◀	\Pisymbol{cryst}{133}	◆	\Pisymbol{cryst}{240}
◆	\Pisymbol{cryst}{60}	✓	\Pisymbol{cryst}{135}	◀	\Pisymbol{cryst}{241}
◀	\Pisymbol{cryst}{61}	◀	\Pisymbol{cryst}{136}	▶	\Pisymbol{cryst}{242}
◀	\Pisymbol{cryst}{62}	✓	\Pisymbol{cryst}{137}	◀	\Pisymbol{cryst}{243}

TABLE 519: dice Dice

□	\Pisymbol{dice3d}{49}	□	\Pisymbol{dice3d}{101}	□	\Pisymbol{dice3d}{111}
□	\Pisymbol{dice3d}{50}	□	\Pisymbol{dice3d}{102}	□	\Pisymbol{dice3d}{112}
□	\Pisymbol{dice3d}{51}	□	\Pisymbol{dice3d}{103}	□	\Pisymbol{dice3d}{113}
□	\Pisymbol{dice3d}{52}	□	\Pisymbol{dice3d}{104}	□	\Pisymbol{dice3d}{114}
□	\Pisymbol{dice3d}{53}	□	\Pisymbol{dice3d}{105}	□	\Pisymbol{dice3d}{115}
□	\Pisymbol{dice3d}{54}	□	\Pisymbol{dice3d}{106}	□	\Pisymbol{dice3d}{116}
□	\Pisymbol{dice3d}{97}	□	\Pisymbol{dice3d}{107}	□	\Pisymbol{dice3d}{117}
□	\Pisymbol{dice3d}{98}	□	\Pisymbol{dice3d}{108}	□	\Pisymbol{dice3d}{118}
□	\Pisymbol{dice3d}{99}	□	\Pisymbol{dice3d}{109}	□	\Pisymbol{dice3d}{119}
□	\Pisymbol{dice3d}{100}	□	\Pisymbol{dice3d}{110}	□	\Pisymbol{dice3d}{120}

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 520: magic Trading Card Symbols

⓪	\Pisymbol{magic}{48}	⑥	\Pisymbol{magic}{54}	⑦	\Pisymbol{magic}{55}	⑧	\Pisymbol{magic}{56}	⑨	\Pisymbol{magic}{57}	⑩	\Pisymbol{magic}{58}	⑪	\Pisymbol{magic}{66}	⑫	\Pisymbol{magic}{71}	⑬	\Pisymbol{magic}{72}
①	\Pisymbol{magic}{49}	⑤	\Pisymbol{magic}{50}	③	\Pisymbol{magic}{51}	④	\Pisymbol{magic}{52}	②	\Pisymbol{magic}{53}	⑩	\Pisymbol{magic}{59}	⑪	\Pisymbol{magic}{60}	⑫	\Pisymbol{magic}{61}	⑬	\Pisymbol{magic}{62}
⑤	\Pisymbol{magic}{53}	⑩	\Pisymbol{magic}{59}	⑪	\Pisymbol{magic}{60}	⑫	\Pisymbol{magic}{61}	⑬	\Pisymbol{magic}{62}	⑭	\Pisymbol{magic}{63}	⑮	\Pisymbol{magic}{64}	⑯	\Pisymbol{magic}{65}	⑰	\Pisymbol{magic}{66}
⑪	\Pisymbol{magic}{60}	⑫	\Pisymbol{magic}{61}	⑬	\Pisymbol{magic}{62}	⑭	\Pisymbol{magic}{63}	⑮	\Pisymbol{magic}{64}	⑯	\Pisymbol{magic}{65}	⑰	\Pisymbol{magic}{66}	⑱	\Pisymbol{magic}{67}	⑲	\Pisymbol{magic}{68}
⑮	\Pisymbol{magic}{63}	⑯	\Pisymbol{magic}{64}	⑰	\Pisymbol{magic}{65}	⑱	\Pisymbol{magic}{66}	⑲	\Pisymbol{magic}{67}	⑳	\Pisymbol{magic}{68}	㉑	\Pisymbol{magic}{69}	㉒	\Pisymbol{magic}{70}	㉓	\Pisymbol{magic}{71}

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:

⓪–⑨	0–9	Circled numerals 0–9
❶	B	Black magic symbol
❷	G	Green magic symbol
❸	R	Red magic symbol
❹	T	Tap symbol (tilted "T" in a circle)
❺	U	Blue magic symbol
❻	W	White magic symbol
❽	X	Circled "X" (for mana cost, e.g., Fireball)
❾	Z	Circled "10" (for mana cost, e.g., Aladdin's Lamp)

TABLE 521: bartel-chess-fonts Chess Pieces and Chessboard Squares

♙	\Pisymbol{fselch}{0}	♘	\Pisymbol{fselch}{55}	♗	\Pisymbol{fselch}{110}
♘	\Pisymbol{fselch}{1}	♞	\Pisymbol{fselch}{56}	♝	\Pisymbol{fselch}{111}
♝	\Pisymbol{fselch}{2}	♞	\Pisymbol{fselch}{57}	♜	\Pisymbol{fselch}{112}
♜	\Pisymbol{fselch}{3}	♝	\Pisymbol{fselch}{58}	♝	\Pisymbol{fselch}{113}
♚	\Pisymbol{fselch}{4}	♞	\Pisymbol{fselch}{59}	♞	\Pisymbol{fselch}{114}
♛	\Pisymbol{fselch}{5}	♝	\Pisymbol{fselch}{60}	♜	\Pisymbol{fselch}{115}
♝	\Pisymbol{fselch}{6}	♞	\Pisymbol{fselch}{61}	♝	\Pisymbol{fselch}{116}
♞	\Pisymbol{fselch}{7}	♝	\Pisymbol{fselch}{62}	♜	\Pisymbol{fselch}{117}
♜	\Pisymbol{fselch}{8}	♝	\Pisymbol{fselch}{63}	♞	\Pisymbol{fselch}{118}
♝	\Pisymbol{fselch}{9}	♞	\Pisymbol{fselch}{64}	♝	\Pisymbol{fselch}{119}
♞	\Pisymbol{fselch}{10}	♝	\Pisymbol{fselch}{65}	♞	\Pisymbol{fselch}{120}
♝	\Pisymbol{fselch}{11}	♞	\Pisymbol{fselch}{66}	♝	\Pisymbol{fselch}{121}
♞	\Pisymbol{fselch}{12}	♝	\Pisymbol{fselch}{67}	♞	\Pisymbol{fselch}{122}
♝	\Pisymbol{fselch}{13}	♞	\Pisymbol{fselch}{68}	♜	\Pisymbol{fselch}{123}
♞	\Pisymbol{fselch}{14}	♝	\Pisymbol{fselch}{69}	♞	\Pisymbol{fselch}{124}
♝	\Pisymbol{fselch}{15}	♞	\Pisymbol{fselch}{70}	♝	\Pisymbol{fselch}{125}

(continued on next page)

(continued from previous page)

♚	\Pisymbol{fselch}{16}	♚	\Pisymbol{fselch}{71}	♚	\Pisymbol{fselch}{126}
♛	\Pisymbol{fselch}{17}	♛	\Pisymbol{fselch}{72}	♛	\Pisymbol{fselch}{127}
♝	\Pisymbol{fselch}{18}	♝	\Pisymbol{fselch}{73}	♝	\Pisymbol{fselch}{128}
♞	\Pisymbol{fselch}{19}	♞	\Pisymbol{fselch}{74}	♞	\Pisymbol{fselch}{129}
♝	\Pisymbol{fselch}{20}	♝	\Pisymbol{fselch}{75}	♝	\Pisymbol{fselch}{130}
♞	\Pisymbol{fselch}{21}	♞	\Pisymbol{fselch}{76}	♞	\Pisymbol{fselch}{131}
♝	\Pisymbol{fselch}{22}	♝	\Pisymbol{fselch}{77}	♝	\Pisymbol{fselch}{132}
♞	\Pisymbol{fselch}{23}	♞	\Pisymbol{fselch}{78}	♞	\Pisymbol{fselch}{133}
♝	\Pisymbol{fselch}{24}	♝	\Pisymbol{fselch}{79}	♝	\Pisymbol{fselch}{134}
♞	\Pisymbol{fselch}{25}	♞	\Pisymbol{fselch}{80}	♞	\Pisymbol{fselch}{135}
♝	\Pisymbol{fselch}{26}	♝	\Pisymbol{fselch}{81}	♝	\Pisymbol{fselch}{136}
♞	\Pisymbol{fselch}{27}	♞	\Pisymbol{fselch}{82}	♞	\Pisymbol{fselch}{137}
♝	\Pisymbol{fselch}{28}	♝	\Pisymbol{fselch}{83}	♝	\Pisymbol{fselch}{138}
♞	\Pisymbol{fselch}{29}	♞	\Pisymbol{fselch}{84}	♞	\Pisymbol{fselch}{139}
♝	\Pisymbol{fselch}{30}	♝	\Pisymbol{fselch}{85}	♝	\Pisymbol{fselch}{140}
♞	\Pisymbol{fselch}{31}	♞	\Pisymbol{fselch}{86}	♞	\Pisymbol{fselch}{141}
♝	\Pisymbol{fselch}{32}	♝	\Pisymbol{fselch}{87}	♝	\Pisymbol{fselch}{142}
♞	\Pisymbol{fselch}{33}	♞	\Pisymbol{fselch}{88}	♞	\Pisymbol{fselch}{143}
♝	\Pisymbol{fselch}{34}	♝	\Pisymbol{fselch}{89}	♝	\Pisymbol{fselch}{144}
♞	\Pisymbol{fselch}{35}	♞	\Pisymbol{fselch}{90}	○	\Pisymbol{fselch}{145}
♝	\Pisymbol{fselch}{36}	♝	\Pisymbol{fselch}{91}	●	\Pisymbol{fselch}{151}
♞	\Pisymbol{fselch}{37}	♞	\Pisymbol{fselch}{92}	○	\Pisymbol{fselch}{163}
♝	\Pisymbol{fselch}{38}	♝	\Pisymbol{fselch}{93}	●	\Pisymbol{fselch}{169}
♞	\Pisymbol{fselch}{39}	♞	\Pisymbol{fselch}{94}	●	\Pisymbol{fselch}{175}
♝	\Pisymbol{fselch}{40}	♝	\Pisymbol{fselch}{95}	☒	\Pisymbol{fselch}{180}
♞	\Pisymbol{fselch}{41}	♞	\Pisymbol{fselch}{96}	☒	\Pisymbol{fselch}{186}
♝	\Pisymbol{fselch}{42}	♝	\Pisymbol{fselch}{97}	☒	\Pisymbol{fselch}{192}
♞	\Pisymbol{fselch}{43}	♞	\Pisymbol{fselch}{98}	☒	\Pisymbol{fselch}{198}
♝	\Pisymbol{fselch}{44}	♝	\Pisymbol{fselch}{99}	☒	\Pisymbol{fselch}{204}
♞	\Pisymbol{fselch}{45}	♞	\Pisymbol{fselch}{100}	☒	\Pisymbol{fselch}{210}
♝	\Pisymbol{fselch}{46}	♝	\Pisymbol{fselch}{101}	☒	\Pisymbol{fselch}{216}
♞	\Pisymbol{fselch}{47}	♞	\Pisymbol{fselch}{102}	☒	\Pisymbol{fselch}{222}
♝	\Pisymbol{fselch}{48}	♝	\Pisymbol{fselch}{103}	☒	\Pisymbol{fselch}{228}
♞	\Pisymbol{fselch}{49}	♞	\Pisymbol{fselch}{104}	☒	\Pisymbol{fselch}{234}
♝	\Pisymbol{fselch}{50}	♝	\Pisymbol{fselch}{105}	☒	\Pisymbol{fselch}{240}
♞	\Pisymbol{fselch}{51}	♞	\Pisymbol{fselch}{106}	☒	\Pisymbol{fselch}{246}
♝	\Pisymbol{fselch}{52}	♝	\Pisymbol{fselch}{107}		
♞	\Pisymbol{fselch}{53}	♞	\Pisymbol{fselch}{108}		
♝	\Pisymbol{fselch}{54}	♝	\Pisymbol{fselch}{109}		

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 “ $\text{\LaTeX} 2_{\varepsilon}$ Font Selection” [LAT00] for advice on how to expose these sorts of fonts to \LaTeX using `\DeclareFontFamily` and `\DeclareFontShape`.

10 Additional Information

Unlike the previous sections of this document, Section 10 does not contain new symbol tables. Rather, it provides additional help in using the Comprehensive L^AT_EX 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^AT_EX. And finally, it lists some statistics about this document itself.

10.1 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^AT_EX will either output an error message or replace an earlier-defined symbol with a later-defined symbol. Table 522 on the following page 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 522, not impossible. The general procedure is to load the first package, rename the conflicting symbols, and then load the second package. Examine the L^AT_EX 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{M} symbol sets, and L^AT_EX 2 _{ε} 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 522 because they are designed to be compatible with the symbols they replace. Table 523 on page 228 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}
```

10.2 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 524 on page 228 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^AT_EX 2 _{ε} 's `\fontsize` command. Because the symbols shown belong to the Computer Modern family, the `type1cm` package needs to be loaded to support font sizes larger than 24.88 pt.

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_EX 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 1 on page 228. 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.

TABLE 522: Symbol Name Clashes

Symbol	$\text{\LaTeX}\ 2\epsilon$	$\mathcal{AM}\mathcal{S}$	stmaryrd	wasysym	mathabx	marvosym	bding	ifsym	dingbat	wsipa
<code>\baro</code>			ϕ							Θ
<code>\bigtriangledown</code>	\bigtriangledown	\triangle		∇	Δ					
<code>\bigtriangleup</code>			\checkmark							
<code>\checkmark</code>					\circ			\bigcirc		
<code>\Circle</code>							\dagger	\times		
<code>\Cross</code>						\gg				
<code>\ggg</code>							\boxtimes			
<code>\Letter</code>										
<code>\lightning</code>					\not		\not			
<code>\Lightning</code>										
<code>\lll</code>						\ll				
<code>\Square</code>							\square			
<code>\Sun</code>							\odot			
<code>\TriangleDown</code>							\blacktriangledown	\triangledown		
<code>\TriangleUp</code>							\blacktriangleup	\triangle		

TABLE 523: Example of a Benign Name Clash

Symbol	Default (Computer Modern)	txfonts (Times Roman)
R	R	R
\textrecipe	R	R

TABLE 524: Sample resized delimiters

Symbol	Default size	\big	\Big	\bigg	\Bigg	\left / \right	\fontsize
\}	}	}	}	}	}	{	}
\uparrow	↑	↑	↑	↑	↑	↑	↑

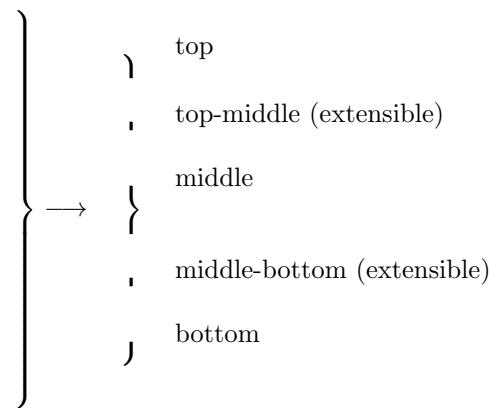


Figure 1: Implementation of variable-sized delimiters

10.3 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^AT_EX 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^AT_EX binding for it. For example, the PostScript Symbol font contains a “ \lrcorner ” 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^AT_EX 2_E's low-level font commands [LAT00] and use T_EX'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:

```
\newcommand{\textlongs}{%
  \fontencoding{TS1}\fontfamily{lmr}\selectfont\char115%
}
```

Then, “`\textlongs ucce\textlongs sful`” will produce “successful”—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 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 “ \lrcorner ” symbol by typesetting character number 191 in the `psy` (PostScript Symbol) font family.

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 (“ $\text{?}^{\text{?}}$ ”), and `\rotatebox[origin=c]{180}{ι}` produces the definite-description operator (“ ? ”). As noted by Marc Olschok in a July 2011 post on `comp.text.tex`, Project Gutenberg uses `\reflectbox` to typeset the part (“3”) and whole (“ε”) relations used in Dedekind's set notation:

```
\newcommand\partof{\mathrel{\raisebox{0.45ex}{$\mathfrak{z}$}}\mkern-1mu{}}
\newcommand\wholeof{\mathrel{\reflectbox{$\mathfrak{z}$}}\mkern-1mu{}}
```

The disadvantage of the `graphicx`/`graphics` approach is that not every T_EX backend handles graphical transformations.⁵ 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 “ ? ”. Similarly, `tipa`'s `\textrevepsilon` (“3”) or `wsipa`'s `\revepsilon` (“3”) may be used to

⁵As an example, Xdvi ignores both `\reflectbox` and `\rotatebox`.

express the mathematical notion of “such that” in a cleaner manner than with `\reflectbox` or `\rotatebox`.⁶

Joining and overlapping existing symbols

Symbols that do not exist in any font can sometimes be fabricated out of existing symbols. The L^AT_EX 2 _{ε} source file `fontdef.dtx` contains a number of such definitions. For example, `\models` (see Table 88 on page 52) is defined in that file with:

```
\def\models{\mathrel|\joinrel=}
```

where `\mathrel` and `\joinrel` are used to control the horizontal spacing. `\def` is the T_EX primitive upon which L^AT_EX’s `\newcommand` is based. See The T_EXbook [Knu86a] for more information on all three of those commands.

With some simple pattern-matching, one can easily define a backward `\models` sign (“=|”):

```
\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, L^AT_EX 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-9mu h}}
```

We can just as easily define other barred letters:

```
\def\bbar{{\mathchar`26\mkern-9mu b}}
\def\dbar{{\mathchar`26\mkern-12mu d}}
```

(The space after the “mu” is optional but is added for clarity.) `\bbar` and `\dbar` define “ \bar{b} ” and “ \bar{d} ”, respectively. Note that `\dbar` requires a greater backward math kern than `\bbar`; a -9μ 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}`⁷ 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}{c}{[-2ex]*&*}%
    \end{tabular}}}}
```

Note how the space between columns (`\tabcolsep`) and rows (`\[\dots]`) is made negative to squeeze the asterisks closer together.

There is a T_EX 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 `\cdot`)—as follows:

⁶More common symbols for representing “such that” include “|”, “:”, and “s.t.”.

⁷L^AT_EX’s `\stackrel` command is similar but is limited to placing a symbol above a binary relation.

```
\newcommand{\dotcup}{\ensuremath{\mathaccent{\cdot}\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 *L^AT_EX* but takes a list of vertical material instead of `\backslash`-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` (“~”) symbols with 0.35 *x*-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 *L^AT_EX* 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` primitive, `\ooalign` uses *TeX*’s tabular syntax instead of *L^AT_EX*’s (i.e., with `\cr` as the row terminator instead of `\backslash`). The following example of `\ooalign`, a macro that defines a standard-state symbol (`\stst`, “ \circ ”) as a superscripted Plimsoll line (`\barcirc`, “ \circ ”),⁸ 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-$\hfil\cr\hfil#2$\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 “3” symbol for “such that” discussed on page 229:

```
\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 “ $\not D$ ”. However, the `\declareoverlashed` command provides the flexibility to specify the mathematical context of the composite character (operator, relation, punctuation, etc., as will be discussed in Section 10.4), 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 (“ I ”). This can be declared as follows:

```
\newcommand{\rqm}{%
  \declareoverlashed{}{\text{-}}{0.04}{0}{I}\slashed{I}}
```

⁸While `\barcirc` illustrates how to combine symbols using `\ooalign`, the `stmaryrd` package’s `\minuso` command (Table 52 on page 32) provides a similar glyph (“ \circ ”) as a single, indivisible symbol.

`\declare{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 the next page) to make `\declare` 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 `\declare` 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:

$$\not\Rightarrow \not\Longrightarrow$$

vs.

$$\not\Rightarrow \centernot\Longrightarrow$$

See the `centernot` documentation for more information.

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 `TEXbook` [Knu86a] for a more complete description.) For example, the following `LATEX` code—posted to `comp.text.tex` by Torsten Bronger—composes a sub/superscriptable “ \topbot ” symbol out of `\top` and `\bot` (“ \top ” and “ \bot ”):

```
\def\topbotatom#1{\hbox{\hbox to 0pt{\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#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 the UK `TEX` Users' Group FAQ at <http://www.tex.ac.uk/faq>.) `\dashint` produces a single-dashed integral sign (“ $\overline{\int}$ ”), while `\ddashint` produces a double-dashed one (“ $\overline{\overline{\int}}$ ”). The `\Xint` macro defined above can also be used to generate a wealth of new integrals: “ $\overline{\int}$ ” (`\Xint\circlearrowright`), “ $\overline{\int}$ ” (`\Xint\circlearrowleft`), “ $\overline{\int}$ ” (`\Xint\subset`), “ $\overline{\int}$ ” (`\Xint\infty`), and so forth.

`LATEX 2 ϵ` 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 (“ $\perp\!\!\!\perp$ ”) to `comp.text.tex` in June 2000:

```
\newcommand{\independent}{\protect\mathpalette{\protect\independentT}{\perp}}
\def\independentT#1#2{\mathrel{\rlap{\#1}\mkern2mu{#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 later on this page.

Some people like their square-root signs with a trailing “hook” (i.e., “ $\sqrt{-}$ ”) 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 `\nesarrow` (“ \nearrow ”) and `\nwsearrow` (“ \nwarrow ”).⁹

```
\newcommand{\nesarrow}{\mathrel{\text{$\nearrow$\llap{$\swarrow$}}}}
\newcommand{\nwsearrow}{\mathrel{\text{$\nwarrow$\llap{$\searrow$}}}}
```

`\text` resembles `LATEX`’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 \lineskip\limits-\maxdimen
\ialign{\hfil$#1##$\hfil\cr#2\crcr}}}
\makeatother
```

The `\makeatletter` and `\makeatother` commands are needed to coerce `LATEX` into accepting “`@`” as part of a macro name. `\moverlay` takes a list of symbols separated by `\cr` (`TEX`’s equivalent of `LATEX`’s `\backslash`). For example, the `\topbot` command defined on the previous page could have been expressed as “`\moverlay{\top\cr\bot}`” and the `\nesarrow` 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`.

⁹Note that if your goal is to typeset commutative diagrams or pushout/pullback diagrams, then you should probably be using `Xy-pic`.

Modifying L^AT_EX-generated symbols

Oftentimes, symbols composed in the L^AT_EX 2_ε source code can be modified with minimal effort to produce useful variations. For example, `fontdef.dtx` composes the `\ddots` symbol (see Table 269 on page 119) 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^AT_EX 2_ε shortcut for “pt” or “1.0pt”. The remaining commands are defined in The T_EXbook [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.

Producing complex accents

Accents are a 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_EX writes his name as “Hàn Thé Thành”. The `dblaccnt` package enables L^AT_EX to stack accents, as in “H\‘an Th\’{^\^e} Th\‘anh” (albeit not in the OT1 font encoding). In addition, the `wsipa` 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 “ř”. See the `wsipa` 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 “ƒ” and `\accentset{e}{X}` produces “᷊”. `\underaccent` does the same thing, but places the accent beneath the character. This enables constructs like `\underaccent{\tilde}{V}`, which produces “᷊”. `accents` provides other accent-related features as well; see the documentation for more information.

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^AT_EX’s `\hrulefill` command:

```
\makeatletter
\def\equalsfill{$\m@th\mathord=\mkern-7mu{%
  \cleaders\hbox{$!\mathord=\!$}\hfill{%
  \mkern-7mu\mathord=$}}}
\makeatother
```

T_EX’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^AT_EX’s `\stackrel` command, which stacks one mathematical expression (slightly reduced in size) atop another. Hence, “`\stackrel{a}{\rightarrow}`”

produces “ $\overset{a}{\rightarrow}$ ” and “ $X \stackrel{\text{definition}}{\stackrel{a}{\rightarrow}} Y$ ” produces “ $X \overset{\text{definition}}{\overset{a}{\rightarrow}} Y$ ”.

If all that needs to extend are horizontal and vertical lines—as opposed to repeated symbols such as the “=” in the previous example—LATEX’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 255).

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{##\crcr\noalign{\kern3\p@}
  \downbracketfill\crcr\noalign{\kern3\p@\nointerlineskip}
  $ \hfil\displaystyle{#1}\hfil$\crcr}}}\limits}
\def\underbracket#1{\mathop{\vtop{\ialign{##\crcr
  $ \hfil\displaystyle{#1}\hfil$\crcr\noalign{\kern3\p@\nointerlineskip}
  \upbracketfill\crcr\noalign{\kern3\p@}}}\limits}}
\def\overparenthesis#1{\mathop{\vbox{\ialign{##\crcr\noalign{\kern3\p@}
  \downparenthfill\crcr\noalign{\kern3\p@\nointerlineskip}
  $ \hfil\displaystyle{#1}\hfil$\crcr}}}\limits}
\def\underparenthesis#1{\mathop{\vtop{\ialign{##\crcr
  $ \hfil\displaystyle{#1}\hfil$\crcr\noalign{\kern3\p@\nointerlineskip}
  \upparenthfill\crcr\noalign{\kern3\p@}}}\limits}}
\def\downparenthfill{$\m@th\braceleft\leaders\vrule\hfill\bracerd$}
\def\upparenthfill{$\m@th\bracel\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 525 showcases these accents. The TEXbook [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., `\braceleft` [“ \langle ”] for `\downparenthfill`), a horizontal rule that stretches as wide as possible, and a right symbol (e.g., `\bracerd` [“ \rangle ”] for `\downbracketfill`). `\overbracket`, `\underbracket`, `\overparenthesis`, and `\underparenthesis` are just glue layers that add the appropriate depth and width to the left and right symbols and stack them up vertically.

and `\underparenthesis` merely create a table whose width is determined by the given text, thereby constraining the width of the horizontal rules.

TABLE 525: Manually Composed Extensible Accents

\overbrace{abc}	<code>\overbracket{abc}</code>	\overbrace{abc}	<code>\overparenthesis{abc}</code>
\underline{abc}	<code>\underbracket{abc}</code>	\underline{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

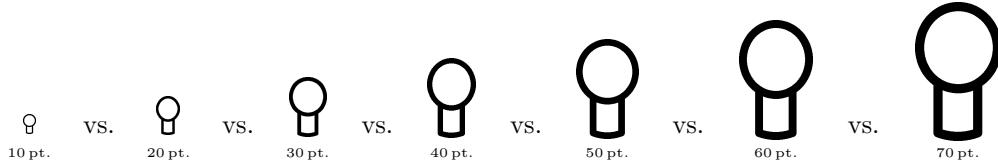


See the `simplewick` documentation for more information.

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 L^AT_EX symbol using METAFONT. Its primary purpose is to cover the L^AT_EX-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 (“Q”).¹⁰ The first step is to draw this in METAFONT. 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 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 `<size>`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 `<size>`, the computer mechanically produces a wider, taller, thicker symbol:



`lightbulb.mf`, shown in Figure 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 2 and Figure 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.

¹⁰I'm not a very good artist; you'll have to pretend that “Q” looks like a light bulb.

```

font.identifier := "LightBulb10";                                % Name the font.
font.size 10pt#;                                              % Specify the design size.

em# := 10pt#;                                                 % "M" width is 10 points.
cap# := 7pt#;                                                 % Capital letter height is 7 points above the baseline.
sb# := 1/4pt#;                                               % Leave this much space on the side of each character.
o# := 1/16pt#;                                              % Amount that curves overshoot borders.

input lightbulb                                         % Load the file that draws the actual glyph.

```

Figure 2: Sample METAFONT size-specific file (`lightbulb10.mf`)

```

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,  $1/2[y_1, y_3]$ );           % z4 is on the left of the circle.
  path bulb;
  bulb = z1 .. z2 .. z3 .. z4 .. cycle;    % Define a path for the bulb itself.
                                                               % 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 = ( $1/2[x_6, x_7]$ , pen_bot - o -  $1/8pt$ ); % z67 lies halfway between z6 and z7 but a jot
lower.                                                       % 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 3: Sample METAFONT size-independent file (`lightbulb.mf`)

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 4. Observe how the grid defined with `makegrid` at the bottom of Figure 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 .

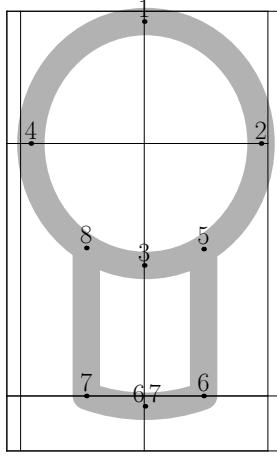


Figure 4: Proof diagram of `lightbulb10.mf`

Most, if not all, TeX distributions include a Plain TeX 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
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 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).

The LightBulb10 font is now usable by TeX. L^AT_EX 2 _{ε} , however, needs more information before documents can use the font. First, we create a font-description file that tells L^AT_EX 2 _{ε} 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 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

Test of lightbulb10 on March 11, 2003 at 1127								
	'0	'1	'2	'3	'4	'5	'6	'7
'10x		Q						
'11x								
	"8	"9	"A	"B	"C	"D	"E	"F
								"4x

Figure 5: Font table produced by `testfont.tex`

(typically “u” for symbol fonts) and $\langle family \rangle$ is the name of the font family. For LightBulb10, let’s call this “bulb”. Figure 6 lists the contents of `ubulb.fd`. The document “ $\text{\LaTeX} 2_{\varepsilon}$ Font Selection” [LAT00] 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 $\text{\LaTeX} 2_{\varepsilon}$ 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 \TeX request for `lightbulb10.tfm` mechanically scaled to the current font size.

```
\DeclareFontFamily{U}{bulb}{}  
\DeclareFontShape{U}{bulb}{m}{n}{<-> lightbulb10}{}  
%
```

Figure 6: $\text{\LaTeX} 2_{\varepsilon}$ font-description file (`ubulb.fd`)

The final step is to write a $\text{\LaTeX} 2_{\varepsilon}$ style file that defines a name for each symbol in the font. Because we have only one symbol our style file, `lightbulb.sty` (Figure 7), is rather trivial. Note that instead of typesetting “A” we could have had `\lightbulb` typeset “`\char65`”, “`\char"41`”, or “`\char'101`” (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 7: $\text{\LaTeX} 2_{\varepsilon}$ 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® Acrobat® (at least in versions prior to 6.0) and of being more memory-efficient when handled by a PostScript interpreter. See <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=textrace> for pointers to tools that can produce Type 1 fonts from METAFONT.

10.4 Math-mode spacing

Terms such as “binary operators”, “relations”, and “punctuation” in Section 3 primarily regard the surrounding spacing. (See the Short Math Guide for \LaTeX [Dow00] for a nice exposition on the subject.) To use a symbol for a different purpose, you can use the \TeX 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 “`$3 x + \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 \TeX book [Knu86a] for the definitive description of math-mode spacing.

The purpose of the “log-like symbols” in Table 181 and Table 182 is to provide the correct amount of spacing around and within multiletter function names. Table 526 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 526: Spacing Around/Within Log-like Symbols

\LaTeX 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 \mathbf{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 \TeX 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 527 contrasts symbols declared with `\DeclareMathOperator` and `\DeclareMathOperator*` in both text style (`$. . $.`) and display style (`\[. . \]`).¹¹

TABLE 527: Defining new log-like symbols

Declaration function	<code>\$\newlogsym_{\{p \in P\}}\$</code>	<code>\[\newlogsym_{\{p \in P\}} \]</code>
<code>\DeclareMathOperator</code>	$\text{newlogsym}_{p \in P}$	$\text{newlogsym}_{p \in P}$
<code>\DeclareMathOperator*</code>	$\text{newlogsym}_{p \in P}$	$\text{newlogsym}_{p \in P}$

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 182 utilize this spacing convention.

10.5 Bold mathematical symbols

\TeX 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.tex.ac.uk/cgi-bin/texfaq2html?label=boldgreek> can be used to produce bold mathematical symbols. Table 528 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.

10.6 ASCII and Latin 1 quick reference

Table 529 on the next page amalgamates data from various other tables in this document into a convenient reference for \TeX 2 ε typesetting of ASCII characters, i.e., the characters available on a typical U.S. computer

¹¹Note that `\displaystyle` can be used to force display style within `$. . $.` and `\textstyle` can be used to force text style within `\[. . \]`.

TABLE 528: Producing bold mathematical symbols

Package	Code	Output	
<i>none</i>	$\$\\alpha + b = \\Gamma \\div D$$	$\alpha + b = \Gamma \div D$	(no bold)
<i>none</i>	$\$\\mathbf{\\alpha + b = \\Gamma \\div D}$$$	$\alpha + b = \Gamma \div D$	
<i>none</i>	$\\boldsymbol{\\alpha + b = \\Gamma \\div D}$$$	$\alpha + b = \Gamma \div D$	
<i>amsbsy</i>	$\$\\pmb{\\alpha + b = \\Gamma \\div D}$$$	$\alpha + b = \Gamma \div D$	(faked bold)
<i>amsbsy</i>	$\$\\boldsymbol{\\alpha + b = \\Gamma \\div D}$$$	$\alpha + b = \Gamma \div D$	
<i>bm</i>	$\$\\bm{\\alpha + b = \\Gamma \\div D}$$$	$\alpha + b = \Gamma \div D$	
<i>fixmath</i>	$\$\\mathbf{\\alpha + b = \\Gamma \\div D}$$$	$\alpha + b = \Gamma \div D$	

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 L^AT_EX 2 _{ε} command to typeset the character as a text character. And the fourth column lists the L^AT_EX 2 _{ε} command to typeset the character within a `\texttt{...}` command (or, more generally, when `\ttfamily` is in effect).

TABLE 529: L^AT_EX 2 _{ε} ASCII Table

Dec	Hex	Char	Body text	<code>\texttt</code>	Dec	Hex	Char	Body text	<code>\texttt</code>
33	21	!	!	!	62	3E	>	<code>\textgreater</code>	>
34	22	"	<code>\textquotedbl</code>	"	63	3F	?	<code>\textquestion</code>	?
35	23	#	<code>\#</code>	<code>\#</code>	64	40	@	<code>\textat</code>	@
36	24	\$	<code>\\$</code>	<code>\\$</code>	65	41	A	<code>\textnormal{A}</code>	A
37	25	%	<code>\%</code>	<code>\%</code>	66	42	B	<code>\textnormal{B}</code>	B
38	26	&	<code>\&</code>	<code>\&</code>	67	43	C	<code>\textnormal{C}</code>	C
39	27	,	,	,	68	44	:	<code>\textcolon</code>	:
40	28	(((69	45	Z	<code>\textnormal{Z}</code>	Z
41	29)))	70	46	[<code>\textnormal{[}</code>	[
42	2A	*	*	*	71	47	\	<code>\textbackslash</code>	<code>\char`\\</code>
43	2B	+	+	+	72	48]	<code>\textnormal{]}</code>]
44	2C	,	,	,	73	49	^	<code>\textnormal{^}</code>	<code>\^{}{}</code>
45	2D	-	-	-	74	50	_	<code>\textnormal{_}</code>	<code>\char`_</code>
46	2E	.	.	.	75	51	'	<code>\textnormal{'}</code>	'
47	2F	/	/	/	76	52	a	<code>\textnormal{a}</code>	a
48	30	0	0	0	77	53	b	<code>\textnormal{b}</code>	b
49	31	1	1	1	78	54	c	<code>\textnormal{c}</code>	c
50	32	2	2	2	79	55	:	<code>\textnormal{:}</code>	:
51	33	:	:	:	80	56	z	<code>\textnormal{z}</code>	z
52	34	:	:	:	81	57	{	<code>\textnormal{{}}</code>	<code>\char`{}`</code>
53	35	:	:	:	82	58	}	<code>\textnormal{}}</code>	<code>\char`{}}</code>
54	36	:	:	:	83	59		<code>\textnormal{ }</code>	<code>\textbar</code>
55	37	:	:	:	84	60	~	<code>\textnormal{~}</code>	<code>\~{}{}</code>
56	38	<	<code>\textless</code>	<	85	61			
57	39	=	=	=	86	62			

The following are some additional notes about the contents of Table 529:

- “!” is not available in the OT1 font encoding.
- Table 529 shows a close quote for character 39 for consistency with the open quote shown for character 96. A straight quote can be typeset using `\textquotesingle` (cf. Table 46).

- The characters “<”, “>”, and “|” do work as expected in math mode, although they produce, respectively, “ \textless ”, “ \textgreater ”, and “ — ” in text mode when using the OT1 font encoding.¹² The following are some alternatives for typesetting “<”, “>”, and “|”:
 - Specify a document font encoding other than OT1 (as described on page 12).
 - Use the appropriate symbol commands from Table 2 on page 14, viz. `\textless`, `\textgreater`, and `\textbar`.
 - Enter the symbols in math mode instead of text mode, i.e., `$<$`, `$>$`, and `$|$`.

Note that for typesetting metavariables many people prefer `\textlangle` and `\textrangle` to `\textless` and `\textgreater`; i.e., “`\langle filename \rangle`” instead of “`<filename>`”.

- Although “/” does not require any special treatment, L^AT_EX 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 88 on page 52), which produces a somewhat wide “ \sim ”, or the `textcomp` package’s `\texttildelow` (shown in Table 46 on page 28), which produces a vertically centered “ \sim ” in most fonts but a baseline-oriented “ \sim ” in Computer Modern, `txfonts`, `pxfonts`, and various other fonts originating from the T_EX 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 326 on page 135.
- 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 529, Table 530 on the next page is an amalgamation of data from other tables in this document. While Table 529 shows how to typeset the 7-bit ASCII character set, Table 530 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 530:

- 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 18 on page 21 plus an empty argument. For instance, `\={}` is essentially the same as `\textasciimacron`.
- The commands in the “L^AT_EX 2 _{ϵ} ” columns work both in body text and within a `\textttt{...}` command (or, more generally, when `\ttfamily` is in effect).
- The “£” and “\$” glyphs occupy the same slot (36) of the OT1 font encoding, with “£” appearing in italic fonts and “\$” appearing in roman fonts. A problem with L^AT_EX’s default handling of this double-mapping is that “`\sffamily\slshape\pounds`” produces “\$”, not “£”. Other font encodings use separate slots for the two characters and are therefore robust to the problem of “£”/“\$” conflicts. Authors who use `\pounds` should select a font encoding other than OT1 (as explained on page 12) or use the `textcomp` package, which redefines `\pounds` to use the TS1 font encoding.

¹²Donald Knuth didn’t think such symbols were important outside of mathematics so he omitted them from his text fonts.

TABLE 530: LATEX 2 ε Latin 1 Table

Dec	Hex	Char	LATEX 2 ε		Dec	Hex	Char	LATEX 2 ε
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	«	\guillemotleft	(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	\textTH (T1)
175	AF	—	\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	’	\textasciacute	(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{c}		232	E8	è	\`{\{}e\}}
185	B9	í	\textonesuperior	(tc)	233	E9	é	\'{e}
186	BA	º	\textordmasculine		234	EA	ê	\^{\{}e\}}
187	BB	»	\guillemotright	(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	Ҫ	\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)				

- Character 173, \-, is shown as “-” but is actually a discretionary hyphen; it appears only at the end of a line.

Microsoft® Windows® 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 531 presents the characters with which CP1252 augments the standard Latin 1 table.

TABLE 531: L^AT_EX 2 _{ε} Code Page 1252 Table

Dec	Hex	Char	L ^A T _E X 2 _{ε}		Dec	Hex	Char	L ^A T _E X 2 _{ε}
128	80	€	\texteuro	(tc)	145	91	‘	‘
130	82	,	\quotesinglbase	(T1)	146	92	’	’
131	83	f	\textit{f}		147	93	“	“
132	84	„	\quotedblbase	(T1)	148	94	”	”
133	85	…	\dots		149	95	•	\textbullet
134	86	†	\dag		150	96	—	--
135	87	‡	\ddag		151	97	—	---
136	88	^	\textasciicircum		152	98	~	\textasciitilde
137	89	%	\textperthousand	(tc)	153	99	™	\texttrademark
138	8A	Š	\v{S}		154	9A	š	\v{s}
139	8B	⟨	\guilsinglleft	(T1)	155	9B	⟩	\guilsinglright (T1)
140	8C	Œ	\OE		156	9C	œ	\oe
142	8E	Ž	\v{Z}		158	9E	ž	\v{z}
					159	9F	Ŷ	\"Y

The following are some additional notes about the contents of Table 531:

- As in Table 530, 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^AT_EX equivalents is available from <http://www.bitjungle.com/isoent/>. Some of the characters presented there make use of `isoent`, a L^AT_EX 2 _{ε} package (available from the same URL) that fakes some of the missing ISO glyphs using the L^AT_EX `picture` environment.¹³

10.7 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_EX and L^AT_EX predate the Unicode standard and Unicode fonts by almost a decade, support for Unicode has had to be added to the base T_EX and L^AT_EX systems. Note first that L^AT_EX 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.

¹³`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.

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.¹⁴ 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 © 2017”—“©” 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{} 2017” and therefore typeset as “Copyright © 2017”.

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+2103.¹⁵ However, “°” is not one of the characters that `ucs` and `inputenc` recognize. The following document shows how to use `\DeclareUnicodeCharacter` to tell \LaTeX that the “°” 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.

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 \XeLaTeX instead of \pdfLaTeX or ordinary \LaTeX . \XeLaTeX handles 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 \XeLaTeX document can either include that character directly as UTF-8 text or use \TeX ’s `\char` primitive, which \XeLaTeX extends to accept numbers larger than 255.

Suppose we want to output the symbols for versicle (“VV”) and response (“RR”) 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 \XeLaTeX document to utilize a system font. The following example defines a `\textjuni` command that uses `fontspec` to typeset its argument in Junicode:

```
\documentclass{article}
\usepackage{fontspec}

\newcommand{\textjuni}[1]{\text{\fontspec{Junicode}\#1}}
```

¹⁴UTF-8 is the 8-bit Unicode Transformation Format, a popular mechanism for representing Unicode symbol numbers as sequences of one to four bytes.

¹⁵The Unicode convention is to express character positions as “U+*hexadecimal number*”.

```
\begin{document}
We use “\textjuni{\char"2123}” for a versicle
and “\textjuni{\char"211F}” for a response.
\end{document}
```

which produces

We use “℣” for a versicle and “℟” 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.

10.8 About this document

History David Carlisle wrote the first version of this document in October, 1994. It originally contained all of the native L^AT_EX symbols (Table 50, Table 72, Table 88, Table 138, Table 181, Table 184, Table 218, Table 219, Table 232, Table 240, Table 294, 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 *AMS* symbols (Table 51, Table 89, Table 90, Table 141, Table 142, Table 185, Table 194, Table 212, and Table 295) and an initial Math Alphabets table (Table 307) were added thereafter. Later, Alexander Holt provided the `stmaryrd` tables (Table 52, Table 74, Table 91, Table 144, Table 177, and Table 213).

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 L^AT_EX 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 L^AT_EX
- 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 532 on the following page lists some of this document’s build characteristics. Most important is the list of packages that L^AT_EX 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 (<http://www.ctan.org/> or one of its many mirror sites) in the directory `tex-archive/info/symbols/comprehensive`. Table 533 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 532 or Table 533.

TABLE 532: Document Characteristics

Characteristic	Value
Source file:	<code>symbols.tex</code>
Build date:	January 19, 2017
Symbols documented:	14283
Packages included:	textcomp latexsym amssymb stmaryrd euscript wasysym pifont manfnt bbdng undertilde ifsym tipa tipx extraipa wsuipa phonetic uly ar metre txfonts mathabx fclfont skak ascii dingbat skull eurosym esvect yfonts yhmath esint mathdots trsym universa upgreek overrightarrow chemarr chemarrow nath trfsigns mathtools phaistos arcs vietnam t4phonet holtbolt semtrans dictsym extarrows protosem harmony hierogl cclenses mathdesign arev MnSymbol fdsymbol boisik cml1 extpfeil keystroke fge turnstile simpsons epsdice feyn staves igo colonequals shuffle fourier dozenal pmboxdraw pigpen clock teubner linearA linearB cypriot sarabian china2e harpoon steinmetz milstd recycle DotArrow ushort hhcount ogonek combelow musixtex ccicons adfsymbols adforn bigints soyombo tfrupee knitting textgreek begriff frege abraces CountriesOfEurope cookingsymbols prodint epiolmec mdwmath rsfso fontawesome stix hands greenpoint nkarta astrosym webomints moonphase dancers semaphor umranda umrandb cryst starfont tikzsymbols dice apl go magic bartel-chess-fonts actuarialangle lilyglyphs knot bclogo bullcntr rubikcube svrsymbols halloweenmath old-arrows allrunes emf esrelation accents nicefrac bm junicode mathrsfs chancery urwchancal calligra bbold mbboard dsfont bbm
Packages omitted:	<i>none</i>

TABLE 533: Package versions used in the preparation of this document

Name	Date	Name	Date	Name	Date
textcomp	2016/06/19	latexsym	1998/08/17	amssymb	2013/01/14
stmaryrd	1994/03/03	euscript	2009/06/22	wasysym	2003/10/30
pifont	2005/04/12	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	2013/07/18	ascii	2006/05/30	dingbat	2001/04/27
skull	2002/01/23	eurosym	1998/08/06	yfonts	2003/01/08
mathdots	2014/06/11	trsym	2000/06/25	universa	98/08/01
upgreek	2003/02/12	chemarr	2016/05/16	mathtools	2015/11/12
phaistos	2004/04/23	arcs	2004/05/09	t4phonet	2004/06/01
semtrans	1998/02/10	dictsym	2004/07/26	extarrows	2008/05/15
protosem	2005/03/18	harmony	2007/05/04	hierogl	2015/06/02
cclenses	2005/05/20	MnSymbol	2007/01/21	fdsymbol	2011/11/01
boisik	2009/08/21	extpfeil	2009/10/31	keystroke	2010/04/23

(continued on next page)

(continued from previous page)

Name	Date	Name	Date	Name	Date
fge	2015/05/19	turnstile	2007/06/23	epsdice	2007/02/15
feyn	2009/10/08	colonequals	2016/05/16	shuffle	2008/10/27
dozenal	2015/01/29	pmbxdraw	2016/05/16	pigpen	2008/12/07
clock	2001/04/10	teubner	2016/03/31	linearA	2006/03/13
linearb	2005/06/22	cypriot	2009/05/22	sarabian	2005/11/12
china2e	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	95/07/17	combelow	2010/05/02
musixtex	2001/07/08	ccicons	2013/04/16	adforn	2010/07/25
bigsints	2010/02/15	soyombo	1996/09/01	tfrupee	2010/12/15
knitting	2010/08/29	textgreek	2011/10/09	frege	2012/08/04
abraces	2012/08/24	CountriesOfEurope	2012/04/18	cookingsymbols	2014/12/28
epiolmec	2003/11/05	mdwmath	1996/04/11	fontawesome	2016/05/15
stix	2015/04/17	starfont	2010/09/29	tikzsymbols	2016/12/26
bclogo	2016/01/10	bullcntr	2007/04/02	rubikcube	2015/09/25
svrsymbols	2016/04/08	halloweenmath	2017/01/06	emf	2016/09/09
accents	2006/05/12	nicefrac	1998/08/04	bm	2016/07/07
calligra	2012/04/10				

10.9 Copyright and license

The Comprehensive L^AT_EX Symbol List

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This work may be distributed and/or modified under the conditions of the L^AT_EX Project Public License, either version 1.3c of this license or (at your option) any later version. The latest version of this license is in

<http://www.latex-project.org/lppl.txt>

and version 1.3c or later is part of all distributions of L^AT_EX version 2006/05/20 or later.

This work has the LPPL maintenance status “maintained”.

The current maintainer of this work is Scott Pakin.

References

- [AMS99] American Mathematical Society. *User’s Guide for the `amsmath` Package (Version 2.0)*, December 13, 1999. Available from <ftp://ftp.ams.org/pub/tex/doc/amsmath/amsldoc.pdf>.
- [Ber01] Karl Berry. Fontname: Filenames for \TeX fonts, June 2001. Available from <http://www.ctan.org/tex-archive/info/fontname>.
- [Che97] Raymond Chen. A METAFONT of ‘Simpsons’ characters. *Baskerville*, 4(4):19, September 1997. ISSN 1354-5930. Available from http://tug.ctan.org/usergrps/uktug/baskervi/4_4/bask4_4.ps.
- [Dow00] Michael Downes. Short math guide for \LaTeX , July 19, 2000. Version 1.07. Available from <http://www.ams.org/tex/short-math-guide.html>.
- [Gib97] Jeremy Gibbons. Hey—it works! *TUGboat*, 18(2):75–78, June 1997. Available from <http://www.tug.org/TUGboat/Articles/tb18-2/tb55works.pdf>.
- [Gre09] Enrico Gregorio. *Appunti di programmazione in \LaTeX e \TeX* , second edition, June 2009. Available from <http://prof.sci.univr.it/~gregorio/introtex.pdf>.
- [Knu86a] Donald E. Knuth. *The $\text{\TeX}book$* , volume A of *Computers and Typesetting*. Addison-Wesley, Reading, MA, USA, 1986.
- [Knu86b] Donald E. Knuth. *The METAFONTbook*, volume C of *Computers and Typesetting*. Addison-Wesley, Reading, MA, USA, 1986.
- [Lam86] Leslie Lamport. *\LaTeX : A document preparation system*. Addison-Wesley, Reading, MA, USA, 1986.
- [LAT98] $\text{\LaTeX}3$ Project Team. A new math accent. *\LaTeX News*. Issue 9, June 1998. Available from <http://www.ctan.org/tex-archive/macros/latex/doc/ltnews09.pdf> (also included in many \TeX distributions).
- [LAT00] $\text{\LaTeX}3$ Project Team. $\text{\LaTeX}2_{\varepsilon}$ font selection, January 30, 2000. Available from <http://www.ctan.org/tex-archive/macros/latex/doc/fntguide.pdf> (also included in many \TeX distributions).

Index

If you’re having trouble locating a symbol, try looking under “T” for “\text...”. Many text-mode commands begin with that prefix. Also, accents are shown over/under a gray box (e.g., “ \hat{a} ” for “ \acute{a} ”).

Some symbol entries appear to be listed repeatedly. This happens when multiple packages define identical (or nearly identical) glyphs with the same symbol name.¹⁶

Symbols	
$\\"{} (\ddot{a})$	21
$\# (\#)$	14, 241
$\$ (\$)$	14, 15, 241
$\$ (\$)$	15
$\% (\%)$	14, 241
$\& (\&)$	14, 37, 241
$\backslash' (\acute{a})$	21
$\backslash (()$	103
$\backslash (($	105
$\backslash (($	108
$\backslash ())$	103
$\backslash ())$	105
$\backslash ())$	108
$\ast (*)$	33
$\backslash ,$	240
$\backslash - (-)$	243, 244
$\backslash . (\ddot{a})$	21
$\backslash (/)$	103
$\backslash (/)$	105
$\backslash / ($	108
$\backslash : (:$	121
$\backslash ; (:$	121
$\backslash < (()$	105
$\backslash < ($	108
$\backslash ? (:$	121
$\backslash [(]$	103
$\backslash [($	105
$\backslash [($	107
$\backslash \backslash$	231
$\backslash] (]$	103
$\backslash] (]$	105
$\backslash] (]$	107
$\backslash ^ (\hat{a})$	21
$\backslash \{\} (^)$	14, 242
$\backslash \mid ()$	103
$\backslash \mid ()$	103, 105
$\backslash \mid (\bar{a})$	21
$\backslash = (\equiv)$	21
$\backslash =\!\!-\!\!-\! (\neg)$	242
$\mid ()$	107
$\mid ()$	105
$\mid ()$	108
$\mid ()$	52, 103, 105, 109
$\mid (($	107
$\mid))$	107
$\mid (/)$	107
$\mid ([$	107
$\mid _$	15
$\mid (-)$	14, 242
$\mid \{ ($	14, 15, 103
$\mid \{ ($	242
$\mid \} ($	14, 15, 103
$\mid \} ($	242
$\mid] (]$	107
$\mid ' (\acute{a})$	21
$\mid ^ (\hat{a})$	21
$\mid \tilde{ } (\tilde{a})$	14, 242
A	
$\backslash A (\acute{a})$	162
$\backslash A (*)$	162
a (esvect package option)	115
$\backslash a (\dot{a})$	162
$\backslash a (\times)$	188
$\backslash a (\ddot{a})$	162
$\backslash AA (\AA)$	15
$\backslash aa (\aa)$	15
$\backslash AAaleph (\aleph)$	153
$\backslash AAayin (\infty)$	153
$\backslash ABeth (\beth)$	153
$\backslash AAcht (\aa)$	165
$\backslash AAdaleth (\aleph)$	153
$\backslash AAhe (\aleph)$	153
$\backslash AAhelmet (\aleph)$	153
$\backslash AAheth (\beth)$	153
$\backslash AAkaph (\beth)$	153
$\backslash AAalamed (\aleph)$	153
$\backslash AAleph (\aleph)$	153
$\backslash AApe (\beth)$	153
$\backslash AAqoph (\beth)$	153
$\backslash AAresh (\aleph)$	153
abzähllich . see textdiscount	
$\backslash AC (\sim)$	130
$\backslash ac (\sim)$	60
$\backslash acarc$	23
$\backslash acbar$	23
accents . . .	21–25, 110–116, 119, 165, 234–236
acute (\acute{a}) . . .	21–25, 110
any character as . . .	234
arc (\bar{a}) . . .	21–24, 113–115
breve (\breve{a}) . . .	21–25, 110
caron (\breve{a}) . . .	21, 25, 110, 114
cedilla (\ddot{a}) . . .	21
circumflex (\hat{a}) . . .	21–23, 110, 112–114
comma-below (\bar{a}) . . .	25
Cyrillic breve (\breve{a}) . . .	21
Cyrillic flex (\bar{a}) . . .	21
Cyrillic umlaut (\ddot{a}) . . .	21
diæresis (\ddot{a}) . . .	21, 24, 25, 110, 129
dot (\dot{a} or \ddot{a}) . . .	21–23, 110
double acute ($\acute{\acute{a}}$) . . .	21, 25
double grave ($\grave{\grave{a}}$) . . .	21
extensible . . .	112–116, 119, 235–236
grave (\grave{a}) . . .	21–25, 110
háček . . . see accents, caron	
hook (\bar{a}) . . .	21
Hungarian umlaut . . . see accents, double acute	
inverted breve ($\bar{\acute{a}}$) . . .	21
kroužek . . . see accents, ring	
macron (\bar{a}) . . .	21, 24, 25, 110, 112, 114
multiple per character . . .	21–23, 234
ogonek (\dot{a}) . . .	21–24
ring (\bar{a}) . . .	21–23, 25, 110, 112
Romanian comma-below accent . . .	see accents, comma-below

¹⁶This occurs frequently between `amssymb` and `mathabx`, for example.

trema	<i>see</i> accents, diæresis
umlaut	<i>see</i> accents, diæresis
accents (package)	110, 234, 247, 248
\accentset	234
accidentals	<i>see</i> musical symbols
accordion notation	168
\accordionBayanBass (□)	168
\accordionDiscant (○)	168
\accordionFreeBass (⊖)	168
\accordionOldEE (⊗)	168
\accordionPull (⊤)	168
\accordionPush (⊲)	168
\accordionStdBass (○)	168
\accurrent (≈)	126
\Acht (♪)	165
\AchtBL (♪)	165
\AchtBR (♪)	165
\acidfree (◎)	122
\ACK (♠)	135
\acontraction	236
\AcPa (γ)	165
\actuarial (■)	235
actuarial symbols	116, 235
actuarialangle (package)	116, 235, 247
\actuarialangle	235
\actuarialangle (■)	116
\acute (ˊ)	111
\acute (ˊ)	110
acute (ˊ)	<i>see</i> accents
\acusus (ˊ)	24
\acwcirclearrow (○)	87
\acwcirclearrowdown (○)	81
\acwcirclearrowleft (○)	81
\acwcirclearrowright (○)	81
\acwcirclearrowup (○)	81
\acwgapcirclearrow (○)	82
\acwgapcirclearrow (○)	87
\acwlefttararrow (↶)	81
\acwlefttararrow (↶)	87
\acwnearcarrow (↷)	81
\acwnwarcarrow (↷)	81
\acwopencirclearrow (○)	82
\acwopencirclearrow (○)	89, 148
\acwoverarcarrow (↷)	81
\acwoverarcarrow (↷)	87
\acwrighttararrow (↷)	81
\acwsearcarrow (↷)	81
\acwsvarcarrow (↷)	81
\acwunderarcarrow (↷)	81
\acwunderarcarrow (↷)	87
\Adaleth (⇒)	153
adeles (A)	<i>see</i> alphabets, math
\adfarrows	140
\adfarrows1 (⇒)	140
\adfarrows2 (→)	140
\adfarrows3 (←)	140
\adfarrows4 (↔)	140
\adfarrows5 (→)	140
\adfarrows6 (↔)	140
\adfarrowsel (↖)	140
\adfarrows2 (↙)	140
\adfarrows3 (↘)	140
\adfarrows4 (↗)	140
\adfarrows5 (↙)	140
\adfarrows6 (↘)	140
\adfarrowsw1 (↗)	140
\adfarrowsw2 (↙)	140
\adfarrowsw3 (↖)	140
\adfarrowsw4 (↗)	140
\adfarrowsw5 (↙)	140
\adfarrowsw6 (↖)	140
\adarroww1 (↔)	140
\adarroww2 (←)	140
\adarroww3 (↔)	140
\adarroww4 (↔)	140
\adarroww5 (←)	140
\adarroww6 (↔)	140
\adfast{1} (✳)	145
\adfast{2} (✳)	145
\adfast{3} (✳)	145
\adfast{4} (✳)	145
\adfast{5} (✳)	145
\adfast{6} (✳)	145
\adfast{7} (✳)	145
\adfast{8} (✳)	145
\adfast{9} (✳)	145
\adfast{10} (✳)	145
\adfbullet (●)	152
\adfbullet{1} (◊)	145
\adfbullet{2} (◊)	145
\adfbullet{3} (✳)	145
\adfbullet{4} (✳)	143
\adfbullet{5} (✳)	143
\adfbullet{6} (✳)	143
\adfbullet{7} (✳)	143
\adfbullet{8} (✳)	143
\adfbullet{9} (✳)	143
\adfbullet{10} (✳)	143
\adfbullet{11} (✳)	145
\adfbullet{12} (✳)	145
\adfbullet{13} (✳)	145
\adfbullet{14} (✳)	145
\adfbullet{15} (✳)	145
\adfbullet{16} (✳)	145
\adfbullet{17} (✳)	145
\adfbullet{18} (✳)	145
\adfbullet{19} (✳)	145
\adfbullet{20} (✳)	145
\adfbullet{21} (✳)	145
\adfbullet{22} (✳)	145
\adfbullet{23} (❖)	145
\adfbullet{24} (✳)	145
\adfbullet{25} (✳)	145
\adfbullet{26} (✳)	145
\adfbullet{27} (●)	150
\adfbullet{28} (●)	150
\adfbullet{29} (■)	150
\adfbullet{30} (♦)	150
\adfbullet{31} (♣)	150
\adfbullet{32} (♠)	150
\adfbullet{33} (▲)	150
\adfbullet{34} (▼)	150
\adfbullet{41} (●)	150
\adfbullet{42} (●)	150
\adfbullet{43} (●)	150
\adfbullet{44} (●)	150
\adfbullet{45} (●)	150
\adfbullet{46} (●)	150
\adfbullet{47} (■)	150
\adfbullet{48} (♦)	150
\adfbullet{49} (♦)	150
\adfbullet{50} (♦)	150
\adfbullet{51} (♦)	150
\adfbullet{52} (♦)	150
\adfclosedflourishleft (~~)	152
\adfclosedflourishright (~~)	152
\adfdiamond (◊)	152
\adfdoubleflourishleft (~~)	152
\adfdoubleflourishright (~~)	152
\adfdoublesharpflourishleft (~~)	152

\adfdoublesharpflourishright (≈)	152
\adfdownhalfleafleft (⌚)	146
\adfdownhalfleafright (⌚)	146
\adfdownleafleft (⌚)	146
\adfdownleafright (⌚)	146
\adfflatdownhalfleafleft (⌚)	
.	146
\adfflatdownhalfleafright (⌚)	
.	146
\adfflatdownoutlineleafleft (⌚)	
.	146
\adfflatdownoutlineleafright (⌚)	
.	146
\adfflateleafleft (⌚)	146
\adfflateafoutlineleft (⌚)	
.	146
\adfflateafoutlineright (⌚)	146
\adfflateafright (⌚)	146
\adfflateafsolidleft (⌚)	
.	146
\adfflateafsolidright (⌚)	146
\adfflourishleft (∽)	152
\adfflourishleftdouble (∽)	
.	152
\adfflourishright (∽)	152
\adfflourishrightdouble (∽)	
.	152
\adfflowerleft (❖)	146
\adfflowerright (❖)	146
\adfgee (⌚)	152
\adfhalfarrowleft (⌚)	140
\adfhalfarrowleftsolid (⌚)	
.	140
\adfhalfarrowright (⌚)	140
\adfhalfarrowrightsolid (⌚)	140
\adfhalfleafleft (⌚)	146
\adfhalfleafright (⌚)	146
\adfhalfleftarrow (⌚)	140
\adfhalfleftarrowhead (⌚)	140
\adfhalfrightarrow (⌚)	140
\adfhalfrightarrowhead (⌚)	140
\adfhangingflatleafleft (⌚)	
.	146
\adfhangingflatleafright (⌚)	
.	146
\adfhangingingleafleft (⌚)	146
\adfhangingingleafright (⌚)	146
\adfleafleft (⌚)	146
\adfleafright (⌚)	146
\adfleftarrowhead (⌚)	140
\adfopenflourishleft (∽)	152
\adfopenflourishright (∽)	152
\adfforn (package)	140, 145, 146, 152, 247, 248
\adfoutlineleafleft (⌚)	146
\adfoutlineleafright (⌚)	146
\adflightarrowhead (⌚)	140
\adfsS (⌚)	152
\adfscharpfavourishleft (→)	152
\adfscharpfavourishright (←)	152
\adfsickleflourishleft (⌚)	152
\adfsickleflourishright (⌚)	152
\adfsingleflourishleft (↔)	152
\adfsingleflourishright (↔)	152
\adfsmallhangingleafleft (⌚)	146
\adfsmallhangingleafright (⌚)	146
\adfsmallleafleft (⌚)	146
\adfsmallleafright (⌚)	146
\adfsolidleafleft (⌚)	146
\adfsolidleafright (⌚)	146
\adfsquare (⌚)	152
\adfsymbols (package)	140, 143, 145, 150, 247
\adftripleflourishleft (⌚⌚)	152
\adftripleflourishright (⌚⌚)	152
\adfwavesleft (⌚)	152
\adfwavesright (⌚)	152
adjoint (†)	see \dag
\Admetos (⌚)	133
Adobe Acrobat	239
\adots (..)	121, 234
\adots (..‘)	120
\adots (..‘‘)	120
\adsorbate (Δ)	137
\adsorbent (⌚)	137
advancing	see \textadvancing
\AE (Æ)	15
\ae (æ)	15
\aeolicbii (oo)	189
\aeolicbii (ooo)	189
\aeolicbiv (oooo)	189
\agem0 (U)	124
\agimel (⌚)	153
\ahe (₩)	153
\ahelmet (₩)	153
\aheth (₩)	153
\ain (‘)	25
\air (Δ)	133
\akaph (Ϣ)	153
\alad ({}	110
\alamed (⌚)	153
\alas (⌚)	110
\albania (⌚)	194
\aldine (⌚)	146
\aldineleft (⌚)	146
\aldineright (⌚)	146
\aldinesmall (⌚)	146
\aleph (ℵ)	99, 124
\aleph (ℵ)	99
\aleph (ℵ)	99
\aleph (ℵ)	100
\Alif (⌚)	20
\allabreve (⌚)	164
\allrunes (package)	162, 247
\Alpha (Α)	97
\alpha (α)	97
alphabets	128
African	16
Cypriot	158
Cyrillic	229
Greek	16, 97, 98, 129, 159
Hebrew	99, 100, 129
hieroglyphic	154
Linear A	154
Linear B	157
math	128
phonetic	17–20
proto-Semitic	153
South Arabian	159
Vietnamese	16
\alphaupha (α)	98
alpine symbols	183
\Alt (Alt)	134
alternative denial	see \uparrow and \lvert
\AltGr (AltGr)	134
\altoclef (⌚)	164
\AM (α)	134
\amalg (II)	31
\amalg (II)	34
\amalg (II)	33
\amalg (II)	36
\Amem (~~)	153
\Amor (⌚)	133
ampersand	see \&
\AMS (package)	12, 15, 31, 42, 52, 53, 65, 67, 72, 75, 76, 92, 96, 97, 99, 100, 102, 104, 110, 113, 116, 119, 123, 124, 129, 226, 227, 246
\amsbsy (package)	241
\amsfonts (package)	124, 128
\amsmath (package)	12, 96, 110, 230, 240

\amssymb (package)	12, 110, 124,
128, 159, 247	
amstext (package)	232, 233
\Anaclasis (÷)	188
\anaclasis (÷)	188
\anceps (×)	189
\ancepsdbrevis (✖)	189
\anchor (฿)	196
\anchor (₺)	152
ancient-language symbols	153–162
and	see \wedge
AND gates	135
	
\ANDd ()	135
	
\ANDl ()	135
\Andorra ()	194
	
\ANDr ()	135
	
\ANDu ()	135
\angdnr (∠)	123
\angl (ℳ)	116
\angle (∠)	123
\angle (∠)	124
\angle (∠)	123
\angle (∠)	123
\angle (∠)	123
\angle (∠)	123
angle notation	131
angles	122–124, 126, 127, 133
\angles (△)	123
\AngleSign (⦿)	122
\angleubar (⦿)	123
\angln (ߨ)	116
Anglo-Frisian runes	162
\anglr (ߨ)	116
\Angstrom (Å)	101
Ångström unit	
math mode	see \mathring
text mode	see \AA
\Angud (ጀ)	110
\angud (ጀ)	110
angular minutes	see \prime
angular seconds	see \second
\Angus (ጀ)	110
\angus (ጀ)	110
animals	153, 154, 158
\Ankh (☥)	182
\Annoey (ࡓ)	196
\annuity (ℳ)	111
annuity symbols	116, 235
\Antidiple (<)	188
\antidiple (<)	188
\Antidiple* (<)	188
\antidiple* (<)	188
\antilabe (::)	121
\antimuon (μ*)	137
\antineutrino (ݏ)	137
\antineutron (ݏ)	137
\antiproton (ݏ⁻)	137
\antiquark (ݏ̄)	137
\antiquarkb (ݏ̄)	137
\antiquarkc (ݏ̄)	137
\antiquarkd (ݏ̄)	137
\antiquarks (ݏ̄)	137
\antiquarkt (ݏ̄)	137
\antiquarku (ݏ̄)	137
\Antisigma (⤵)	188
\antisigma (⤵)	188
\Anun (܂)	153
\anyon (܂)	137
\aoverbrace (܂)	115
\Ape (܂)	153
APL	
symbols	61–62
\apl (package)	134, 247
APL symbols	133, 134
\APLbox (□)	133
\APLboxquestion (܂)	134
\APLboxupcaret (܂)	134
\APLcirc (ℳ)	133
\APLcomment (܂)	133
\APLdown (▽)	133
\APLdownarrowbox (܂)	133
\APLinput (□)	133
\APLinv (܂)	133
\APLleftarrowbox (܂)	133
\APLlog (⊗)	133
\APLminus (⊖)	133
\APLnot (܂)	133
\APLnotbackslash (܂)	134
\APLnotslash (܂)	134
\APLrightarrowbox (܂)	133
\APLstar (*)	133
\APLup (△)	133
\APLuparrowbox (܂)	133
\APLvert (܂)	133
\Apollon (܂)	133
apostropha	see musixgref
\apprge (⩵)	68
\apprle (⩵)	68
\approx (≈)	52
\approx (≈)	57
\approx (≈)	55
\approx (≈)	61
\approxcolon (≈:)	64
\approxcoloncolon (≈::)	64
\approxeq (≈)	52
\approxeq (≈)	60
\approxeq (≈)	57
\approxeq (≈)	55
\approxeq (≈)	61–62
\approxeq (≈)	60
\approxeq (≈)	58, 95
\approxeq (≈)	61
\approxeq (≈)	162
arc (܂)	see accents
\arccos (arccos)	96
\arceq (⤵)	60
\arceq (⤵)	58, 95
\arceq (⤵)	61
\arcfamily	162
arcminutes	see \prime
arcs (package)	24, 247
arcseconds	see \second
\arcsin (arcsin)	96
\arctan (arctan)	96
\Aresh (܂)	153
\arev (package)	140–144, 151, 163, 196, 247
\arg (arg)	96
\Aries (܂)	132
\Aries (܂)	132
\Aries (܂)	133
\Aries (܂)	132
\aries (܂)	131
\arlfamily	162
\armfamily	162
\arnfamily	162
\ArrowBoldDownRight (→)	139
\ArrowBoldRightCircled (⦿)	139
\ArrowBoldRightShort (→)	139
\ArrowBoldRightStrobe (■→)	139
\ArrowBoldUpRight (↗)	139
\arrowbullet (➤)	140
\Arrownot ()/.	95
\Arrownot ()/.	95
\ArrowOver (⤵)	25
\arrowOver (⤵)	25
arrows	75–77, 81, 86–92, 112–118, 133, 134, 139, 140, 153, 158, 182, 193, 199–202, 204–206, 222, 229
diagonal, for reducing subexpressions	112
dotted	117
double-headed, diagonal	233
extensible	112–118
fletched	91, 139
negated	75, 76, 79, 83
arrows (boisik package option)	87

\Arrowvert ()	104
\Arrowvert ()	105
\Arrowvert ()	107
\arrowvert ()	104
\arrowvert ()	105
\arrowvert ()	107
Arseneau, Donald	231–235
\artfamily	162
articulations	<i>see</i> musical symbols
\Asade (↷)	153
\Asamekh (◇)	153
\ASC (ASC)	133
ASCII	12, 15, 135, 217, 226, 240–242, 244–246
table	241
ascii (package)	135, 242, 247
\ascnode (⌚)	131
\Ashin (ω)	153
aspect ratio	130
\Assert (+)	58
\assert (⊣)	58
\assert (⊣)	61
\assumption (★)	137
\ast (*)	33
\ast (*)	31
\ast (*)	35
\ast (*)	34
\ast (*)	33
\ast (*)	36
\asteq (≡)	61
\asteraccent (*)	111
\Asteriscus (※)	188
\Asteriscus (※)	188
\Asterisk (*)	33
\Asterisk (✿)	145
\asterisk (*)	33
\AsteriskBold (✿)	145
\AsteriskCenterOpen (✿)	145
\AsteriskRoundedEnds (✿)	145
asterisks	33, 145
\AsteriskThin (✿)	145
\AsteriskThinCenterOpen (✿)	145
\asterism (※)	230
asteroids	133
astrological symbols	131–133, 206–209
astronomical symbols	131–133, 191, 206–209
\astrosun (⊙)	132
\astrosun (⊙)	131
astrosym (package)	206, 247
asymmetric braces	115
\asymp (≈)	52
\asymp (≈)	58, 95
\asymp (≈)	94
\asymp (≈)	61
\atan (atan)	240
\ataribox (☒)	181
\Atav (+)	153
\Ateth (Ѥ)	153
\AtForty (ѿ)	182
\AtNinetyFive (ѿ)	182
\atom (⚛)	137
atomic math objects	96, 240
\AtSixty (ѿ)	182
\aunderbrace (⏣)	115
\Austria (奥地) (\u262e)	194
\autoleftarrow (←)	117
\autoleftrightharpoons (\iff)	117
\autorightarrow (→)	117
\autorightleftharpoons (\iff)	117
\AutumnTree (栌)	197
\Avav (՞)	153
average	30
\awint (՞)	48
\awint (՞)	48
\awintsl (՞)	50
\awintup (՞)	50
\Ayn (՞)	20
\Ayod (ܵܲ)	153
\Azayin (=)	153
B	
\B (܂)	162
\B	16
\B (܂)	188
b (esvect package option)	115
\b (܂)	21
\b (܂)	188
b (܂)	162
\Ba (܁)	157
babel (package)	16, 97, 98, 159
\babygamma (܃)	19
\backapprox (܃)	55
\backapproxeq (܃)	55
\Backblech (܂)	196
\backcong (܃)	57
\backcong (܃)	55
\backcong (܃)	61
\backdprime (܂)	122
\backepsilon (܂)	52
\backepsilon (܂)	125
\backepsilon (܂)	99
\backeqsim (܃)	55
\backneg (܂)	125
\backprime (܂)	125
\backprime (܂)	124
\backprime (܂)	125
\backprime (܂)	125
\backprime (܂)	122
\backproto (∞)	57
\backsim (܂)	52
\backsim (܂)	60
\backsim (܂)	57
\backsim (܂)	55
\backsim (܂)	61
\backsimeq (܂)	52
\backsimeq (܂)	60
\backsimeq (܂)	57
\backsimeq (܂)	55
\backsimeq (܂)	61
\backsimeqq (܂)	59
\backslash (܂)	103, 124
\backslash (܂)	106
\backslash (܂)	105
\backslash (܂)	126
\backslash (܂)	107
\backslash div (܂)	33
\backtriplesim (܂)	55
\backtrprime (܂)	122
\backturn (܂)	164
\bagmember (܂)	60
\bagmember (܂)	61
\Bai (܂)	157
\Baiii (܂)	157
\bakingplate (܂)	196
\ballotcheck (܂)	144
\ballotx (܂)	144
banana brackets	<i>see</i> \lparenthesis and \rrparenthesis
\banceps (܂)	189
\bar (܂)	111
\bar (܂)	110
\bar (܂)	162
\barb (܂)	19
\barbbrev (܂)	189
\barbrevis (܂)	189
\barcap (܂)	36
\barcirc (܂)	231
\barcup (܂)	36
\bard (܂)	19
\ardownharpoonleft (܂)	90
\ardownharpoonright (܂)	90
\bari (܂)	19
\barin (܂)	100
\barj (܂)	20
\barl (܂)	19

\barlambda (λ)	20
\barleftarrow (\leftarrow)	86
\barleftarrow (\leftarrow)	87
\barleftarrowrightarrowbar ($\overleftarrow{\overrightarrow{}}$)	86
\barleftarrowrightarrowbar ($\overleftarrow{\overrightarrow{}}$)	87
\barleftharpoon ($\overleftarrow{=}$)	77
\barleftharpoondown ($\overleftarrow{\cdot}$)	90
\barleftharpoonup ($\overleftarrow{\cdot}$)	90
\baro (ϕ)	32
\baro (ϕ vs. Θ)	227
\baro (ϕ)	35
\baro (Θ)	19
\BarOver $\overline{}$	25
\barOver $\overline{}$	25
\barovernorthwestarrow ($\overleftarrow{\nwarrow}$)	86
\barovernorthwestarrow ($\overleftarrow{\nwarrow}$)	148
\barp (\wp)	19
barred letters	230
\barrightarrowdiamond ($\rightarrow\!\!\!/\!$)	87
\barrightharpoon (\Rightarrow)	77
\barrightharpoondown ($\rightarrow\!\!\!/$)	90
\barrightharpoonup ($\rightarrow\!\!\!/\!\!\!$)	90
\barsci (\mathfrak{f})	19
\barscu (\mathfrak{t})	19
	
\Bart ()	189
bartel-chess-fonts (package)	224, 225, 247
\baru (\mathfrak{u})	19
\baruparrow (\uparrow)	87
\barupharpoonleft ($\uparrow\!\!\!/$)	90
\barupharpoonright ($\uparrow\!\!\!/\!$)	90
\Barv ($\overline{\tau}$)	58
\Barv ($\overline{\pi}$)	61
\barV ($\overline{\Pi}$)	58
\barV ($\overline{\Pi}$)	61
\barvee ($\overline{\nabla}$)	36
\barwedge ($\overline{\wedge}$)	33
\barwedge ($\overline{\wedge}$)	31
\barwedge ($\overline{\wedge}$)	35
\barwedge ($\overline{\wedge}$)	34
\barwedge ($\overline{\wedge}$)	36
base twelve	
numerals	122
tally markers	185
\BasicTree	197
\bassclef (Bass Clef)	164
\Bat (Bat)	182
\Bau (Bau)	157
\baucircle (\bullet)	150
\bauforms (bauforms)	182
\bauhead ()	182
\bausquare ()	150
\bautriangle ()	150
\BB (ω)	188
\bba (\bowtie)	188
\bbalpha (α)	129
\bbar (β)	230
\bbb (\bowtie)	188
\bbbeta (β)	129
\Bbbk (\mathbb{k})	100
\Bbbk (\mathbf{k})	101
\Bbbk (\mathbb{k})	101
\Bbbsum ($\mathbb{\Sigma}$)	48
bding (package)	139, 141–143, 145, 150, 152, 227, 247
\bbdollar (\$)	129
\bbetter (\mp)	186
\bbeuro (\texteuro)	129
\bbfinalnum (\mathbb{I})	129
\bbgamma ($\mathbb{\delta}$)	129
bbgreekl (mathbbol package option)	129
\BBm ($\mathbb{\omega}$)	188
\BBm ($\mathbb{\omega}$)	188
\bBm (ω)	188
\bbm (package)	128, 247
\bbm (ω)	188
\bbmb (\bowtie)	188
\bbmx ($\bowtie\!\!\!$)	188
\bbnabla (∇)	129
\bbold (package)	128, 247
\bbpe (\exists)	129
\bbqof ($\exists\!\!\!$)	129
\bbrevis (ω)	189
\bbrktbrk (\mathbb{H})	126
\bbslash ($\mathbb{\backslash}$)	32
\bbslash ($\mathbb{\backslash}$)	35
\byod ($^{\circ}$)	129
\bcattention ()	197
	
\bc bombe ()	197
	
\bcbook ()	197
	
\bccalendrier ()	198
	
\bc cle ()	198
	
\bc clefa ()	198
	
\bcclesol ()	198
	
\bccoeur ()	198
	
\bccrayon ()	198
	
\bccube ()	198
	
\bcdalleagne ()	198
	
\bcdanger ()	198
	
\bcdautriche ()	198
	
\bcdbelgique ()	198
	
\cdbulgarie ()	198
	
\cdfrance ()	198
	
\cditalie ()	198
	
\cdluxembourg ()	198
	
\cdodecaedre ()	198
	
\cdpaysbas ()	198
	
\cdz ()	198
	
\ceclaircie ()	198
	
\cetoile ()	197
	
\cfemme ()	197
	
\feujaune ()	197
	
\feuro rouge ()	198
	
\feutri colore ()	198
	
\feuvert ()	198
	
\fleur ()	198
	
\chomme ()	198
	
\chorloge ()	198
	
\cicosaedre ()	198
	
\cinfo ()	198
	
\interdit ()	198
	
\clampe ()	198

\bclogo (package)	197, 198, 247, 248
\bccloupe (🔍)	198
\bcneige (❄️)	198
\bcnote (🎵)	198
\bcnucleaire (☢️)	198
\bcocetaedre (❖)	198
\bcoeil (👁)	198
\bcontraction	236
\bcorne (🐂)	198
\bcours (🐻)	198
\bcoutil (🔧)	198
\bcpanchant (🚩)	197
\bcpeaceandlove (☮️)	197
\bcpluie (🌧)	197
\bcplume (羽毛)	198
\bcpoisson (🐟)	198
\bcquestion (❓)	198
\bcrecyclage (♻️)	198
\bcrosevents (✳️)	198
\bcsmhb (😊)	198
\bcsmmh (😢)	198
\bcsoleil (☀️)	198
\bcspadesuit (♠️)	198
\bcstop (🛑)	198
\bctakecare (⚠️)	198
\bctetraedre (❖)	198
\bctrefle (♣️)	198
\bctrombone (🎼)	198
\bcvaletcoeur (🃏)	198
\bcvelo (🚲)	198
\bcyin (☯️)	198
\Bda (▷)	157
\Bde (☒)	157
\bdecisive (+)	186
\Bdi (⊤)	157
\bdleftarcarrow (↶)	81
\bdnearcarrow (↘)	81
\bdnwarcarrow (↗)	81
\Bdo (∅)	157
\bdoverarcarrow (↷)	81
\bdrightarcarrow (↷)	81
\bdsearcarrow (↙)	81
\bdswarcarrow (↖)	81
\Bdu (¶)	157
\bdunderarcarrow (↓)	81
\Bdwe (ヰ)	157
\Bdwo (ヰ)	157
\Be (𝔸)	157
\Beam (⠄)	136
\Bearing (Δ)	136
\because (∴)	52, 119
\because (∵)	60
\because (∵)	120
\because (∵)	120
\because (∵)	120
\Bed (⤒)	197
begriff (package)	121, 247
Begriffsschrift symbols	121
\BEL (•)	135
\Belarus (❶)	194
\Belgium (❷)	194
\bell (❸)	181
\benzenr (❹)	148
Berry, Karl	249
\Beta (B)	97
\beta (β)	97
\betaup (β)	98
\beth (beth)	99
\beth (beth)	100
\beth (beth)	99
\beth (beth)	99
\beth (beth)	100
better ... see \triangleleft	
\betteris (⌚)	186
\between (⌚)	54
\between (⌚)	52
\between (⌚)	60
\between (⌚)	57
\between (⌚)	55
\between (⌚)	61
\BGassert (†)	121
\BGconditional (█)	121
\BGcontent (.)	121
\BGnot (⌐)	121
\BGquant (〽)	121
\Bi (⫴)	157
\bibridge (⤵)	23
biconditional	
	see \leftrightarrow and \equiv
\Bicycle (🚲)	182
\Big	226, 228
\big	226, 228
big O (O)	see alphabets, math
\Bigassumption (★)	138
\bigassumption (★)	138
\bigast (*)	33
\bigblacktriangledown (▼)	148
\bigblacktriangleup (▲)	148
\bigbosonloop (⟳)	137
\bigbosonloopA (⟳)	137
\bigbosonloopV (⟳)	137
\bigbot (⊥)	126
\bigbox (◻)	42
\bigboxasterisk (✳)	43
\bigboxbackslash (\\\\)	43
\bigboxbot (▣)	43
\bigboxcirc (○)	43
\bigboxcoasterisk (✳)	43
\bigboxdiv (▣)	43
\bigboxdot (▣)	43
\bigboxleft (◧)	44
\bigboxminus (◨)	44
\bigboxplus (⊞)	44
\bigboxright (◨)	44
\bigboxslash (⊘)	43
\bigboxtimes (⊗)	43
\bigboxtop (◧)	43
\bigboxtriangleup (▲)	43
\bigboxvoid (□)	43
\bigcap (∩)	42
\bigcap (∩)	47
\bigcap (∩)	46
\bigcap (∩)	48
\bigcapdot (∩)	47
\bigcapdot (∩)	46
\bigcapplus (⊕)	47
\bigcapplus (⊕)	46
\bigcirc (○)	31
\bigcirc (○)	147
\bigcirc (○)	147
\bigcirc (○)	149
\BigCircle (○)	149
\BigCircle (○)	150
\bigcircle (○)	46
\bigcoast (*)	33
\bigcomplementop (○)	43
\BigCross (☒)	149
\bigcup (∪)	42
\bigcup (∪)	47

\bigcup (U)	46	\bigoint (ʃ)	46	\BigSquare (□)	149
\bigcup (U)	48	\bigoints (ʃ)	46	\bigsqplus (⊕)	43
\bigcupdot (U)	47	\bigointss (ʃ)	46	\bigstar (★)	33
\bigcupdot (U)	46	\bigointsss (ʃ)	46	\bigstar (★)	124
\bigcupdot (U)	49	\bigointssss (ʃ)	46	\bigstar (★)	147
\bigcupplus (⊕)	47, 48	\bigoleft (⊖)	44	\bigstar (★)	147
\bigcupplus (⊕)	46, 47	\bigominus (⊖)	44	\bigstar (★)	147
\bigcurlyvee (Y)	43	\bigominus (⊖)	46	\bigstar (★)	148
\bigcurlyvee (Y)	42	\bigoplus (⊕)	42	\bigtalloblong (ll)	49
\bigcurlyvee (Y)	47	\bigoplus (⊕)	47	\bigtimes (×)	43
\bigcurlyvee (Y)	46	\bigoplus (⊕)	46	\bigtimes (×)	47
\bigcurlyveedot (Y)	46	\bigoplus (⊕)	46	\bigtimes (×)	47
\bigcurlywedge (λ)	43	\bigoplus (⊕)	49	\bigtimes (X)	49
\bigcurlywedge (λ)	42	\bigoplus (⊕)	43	\bigtop (T)	126
\bigcurlywedge (λ)	47	\bigoplus (⊕)	46	\BigTriangleDown (▽)	149
\bigcurlywedge (λ)	46	\bigoplus (⊕)	49	\bigtriangledown (▽)	42
\bigcurlywedgedot (λ)	46	\bigoplus (⊕)	43	\bigtriangledown (▽ vs. ▽)	227
\BigDiamondshape (◇)	149	\bigoplus (⊕)	46	\bigtriangledown (▽)	31
\bigdoublecurlyvee (W)	46	\bigoplus (⊕)	46	\bigtriangledown (▽)	74, 147
\bigdoublecurlywedge (M)	46	\bigostar (⊗)	46	\bigtriangledown (▽)	73
\bigdoublevee (W)	47, 48	\bigotimes (⊗)	42	\bigtriangledown (▽)	148, 149
\bigdoublevee (W)	47	\bigotimes (⊗)	48	\BigTriangleLeft (◀)	149
\bigdoublewedge (M)	47, 48	\bigotimes (⊗)	46	\bigtriangleleft (◀)	148
\bigdoublewedge (M)	47	\bigotimes (⊗)	49	\BigTriangleRight (▶)	149
\Bigg	226, 228	\bigotimes (⊗)	43	\BigTriangleUp (△)	149
\bigg	226, 228	\bigotriangle (◎)	46	\bigtriangleup (Δ)	42
\biggassumption (☆)	138	\bigotriangleup (◎)	43	\bigtriangleup (△ vs. Δ)	227
\BigHBar (—)	149	\bigovert (○)	46	\bigtriangleup (△)	12, 31
\bigint (ʃ)	46	\bigovoid (○)	43	\bigtriangleup (△)	74, 147
\biginterleave ()	42	\bigparallel ()	42	\bigtriangleup (△)	73
\biginterleave ()	126	\bigparr (ꝝ)	52	\bigtriangleup (△)	148, 149
bigints (package)	46, 247, 248	\bigplus (+)	43	\biguplus (⊕)	42
\bigints (ʃ)	46	\bigplus (+)	48	\biguplus (⊕)	48
\bigintss (ʃ)	46	\bigplus (+)	46	\biguplus (⊕)	47
\bigintsss (ʃ)	46	\bigpumpkin (ꝝ)	40	\biguplus (⊕)	49
\bigintssss (ʃ)	46	\BigRightDiamond (◆)	149	\bigvarstar (★)	33
\biginvamp (ꝝ)	52	\bigslopedvvee (V)	36	\BigVBar ()	149
\BigLowerDiamond (◆)	149	\bigslopedwedge (Λ)	36	\bigvee (V)	42
\bignplus (⊕)	42	\bigsqcap (Π)	43	\bigvee (V)	47
\bigoast (⊗)	47	\bigsqcap (Π)	42	\bigvee (V)	47
\bigoast (⊗)	47	\bigsqcap (Π)	48	\bigvee (V)	49
\bigoasterisk (⊛)	43	\bigsqcap (Π)	46	\bigvee (V)	49
\bigobackslash (⊗)	43	\bigsqcapplus (Π)	44	\bigveedot (V)	47
\bigobackslash (⊗)	47	\bigsqcapplus (Π)	48	\bigveedot (V)	47
\bigobot (⊕)	43	\bigsqcapplus (Π)	46	\bigwedge (Λ)	42
\bigocirc (◎)	43	\bigsqcup (U)	42	\bigwedge (Λ)	47
\bigocirc (◎)	47	\bigsqcup (U)	47	\bigwedge (Λ)	47
\bigocoasterisk (⊛)	44	\bigsqcup (U)	46	\bigwedge (Λ)	49
\bigodiv (÷)	44	\bigsqcup (U)	49	\bigwedgedot (Λ)	47
\bigodot (⊙)	42	\bigsqcupdot (U)	47	\bigwedgedot (Λ)	47
\bigodot (⊙)	47	\bigsqcupdot (U)	46	\bigwhitestar (☆)	148
\bigodot (⊙)	47	\bigsqcupplus (⊕)	44	\bigwith (&)	52
\bigodot (⊙)	49	\bigsqcupplus (⊕)	47	\binampersand (&)	32
		\bigsqcupplus (⊕)	47	\binampersand (&)	35
		\bigsqcupplus (⊕)	47	binary operators	31–40
		\bigsqcupplus (⊕)	47	binary relations	52–57, 60–72, 93–95

negated	53, 54, 56–57, 59, 60, 62	
\bindnasrepma (⋮)	32	
\bindnasrepma (⋮)	35	
\Biohazard (☣)	136	
\biohazard (☣)	196	
biological symbols	136	
birds	154	
bishop	187, 224–226	
\bischoppair (¤)	186	
\Bja (✉)	157	
\Bje (✉)	157	
\Bjo (✉)	157	
\Bju (✉)	157	
\Bka (⊕)	157	
\Bke (⊗)	157	
\Bki (▽)	157	
\Bko (†)	157	
\Bku (‡)	157	
\BL (\\)	134	
\black	188	
\BlackBishopOnBlack (✉)	187	
\BlackBishopOnWhite (✉)	187	
blackboard bold	see alphabets, math	
\blackbowtie (■)	35	
\blackcircledownarrow (◐)	148	
\blackcircledrightdot (●)	148	
\blackcircledtwodots (●)	148	
\blackcircleulquadwhite (●)	148	
\blackdiamond (◆)	33	
\blackdiamond (◆)	39	
\blackdiamonddownarrow (◆)	148	
\BlackEmptySquare (▨)	187	
\blackhourglass (☒)	40	
\blackinwhitediamond (◆)	148	
\blackinwhite square (▣)	148	
\BlackKingOnBlack (♔)	187	
\BlackKingOnWhite (♔)	187	
\BlackKnightOnBlack (♞)	187	
\BlackKnightOnWhite (♞)	187	
\blacklefthalfcircle (◐)	148	
\blacklozenge (◆)	124	
\blacklozenge (◆)	39, 147	
\blacklozenge (◆)	147	
\blacklozenge (◆)	147	
\blacklozenge (◆)	148, 149	
\BlackPawnOnBlack (♟)	187	
\BlackPawnOnWhite (♟)	187	
\blackpointerleft (◀)	148	
\blackpointerright (▶)	148	
\BlackQueenOnBlack (♕)	187	
\BlackQueenOnWhite (♕)	187	
\blackrighthalfcircle (◑)	148	
\BlackRookOnBlack (♜)	187	
\BlackRookOnWhite (♜)	187	
\blacksmiley (☺)	126	
\blacksmiley (☺)	181	
\blacksquare (■)	124	
\blacksquare (■)	39, 147	
\blacksquare (■)	38	
\blacksquare (■)	149	
\blackstone	187	
\blacktriangle (▲)	124	
\blacktriangle (▲)	39, 147	
\blacktriangle (▲)	39, 74	
\blacktriangle (▲)	73	
\blacktriangle (▲)	148	
\blacktriangledown (▼)	37	
\blacktriangledown (▼)	124	
\blacktriangledown (▼)	39, 147	
\blacktriangledown (▼)	39, 74	
\blacktriangledown (▼)	73	
\blacktriangledown (▼)	148	
\blacktriangledown (▼)	37	
\blacktriangleleft (◀)	37	
\blacktriangleleft (◀)	72	
\blacktriangleleft (◀)	39	
\blacktriangleleft (◀)	39, 74	
\blacktriangleleft (◀)	73	
\blacktriangleleft (◀)	148	
\blacktriangleright (▶)	37	
\blacktriangleright (▶)	72	
\blacktriangleright (▶)	39	
\blacktriangleright (▶)	39, 74	
\blacktriangleright (▶)	73	
\blacktriangleright (▶)	148	
\blacktriangleright (▶)	37	
\blacktriangleright (▶)	72	
\blacktriangleright (▶)	39	
\blacktriangleright (▶)	39, 74	
\blacktriangleleft (◀)	37	
\blacktriangleleft (◀)	72	
\blacktriangleleft (◀)	39	
\blacktriangleleft (◀)	39, 74	
\blacktriangleright (▶)	37	
\blacktriangleright (▶)	72	
\blacktriangleright (▶)	39	
\blacktriangleright (▶)	39, 74	
\blacktriangleright (▶)	73	
\blacktriangleright (▶)	148	
\blacktriangleright (▶)	37	
\blacktriangleright (▶)	72	
\blacktriangleright (▶)	39	
\blacktriangleright (▶)	39, 74	
\blacktriangleright (▶)	73	
\blacktriangleright (▶)	148	
\blacktriangleup (▲)	37	
\blackwhitespoon (↔)	94	
blank	see \textblank	
\Bleech (△)	182	
\blender (!)	196	
\blitza (↯)	95	
\blitza (↯)	30	
\blitzb (↯)	95	
\blitzc (↯)	95	
\blitzd (↯)	95	
\blitze (↯)	95	
\blkhorzoval (◐)	148	
\blkvertoval (◑)	148	
block-element symbols	190	
\Bm (Ⓜ)	188	
bm (package)	241, 247, 248	
\bm	241	
\bm (Ⓜ)	188	
\Bma (Ⓜ)	157	
\Bme (Ⓣ)	157	
\Bmesonminus (B^-)	138	
\Bmesonnull (B^0)	138	
\Bmesonplus (B^+)	138	
\Bmi (Ⓜ)	157	
\Bmo (Ⓣ)	157	
\bmod	96	
\Bmu (Ⓣ)	157	
\Bna (Ȳ)	157	
\BNC (○)	157	
\BNcc (○○)	157	
\BNccc (○○○)	157	
\BNcd (○○○○)	157	
\BNcm (○○○○○)	157	
\BNd (○○○○○)	157	
\BNdc (○○○○○)	157	
\BNdcc (○○○○○)	157	
\Bne (Ⓣ)	157	
\BNi (↑)	157	
\Bni (Ȳ)	157	
\BNii (〃)	157	
\BNiii (‴)	157	
\BNiv (‴)	157	
\BNix (‴‴)	157	
\BNI (≡≡)	157	
\BNlx (≡≡)	157	
\BNlxx (≡≡)	157	
\BNlxxx (≡≡)	157	
\BNm (Φ)	157	
\Bno (≡≡)	157	
\bNot (≠)	61	
\Bnu ([ɔ])	157	
\BNv (‴)	157	
\BNvi (‴)	157	
\BNvii (‴‴)	157	
\BNviii (‴‴)	157	
\Bnwa (՞՞)	157	
\BNx (՞)	157	

\BNxc (≡≡)	157	\boxbackslash (◻)	37	\boxslash (◻)	37
\BNxl (≡=)	157	\boxbackslash (▣)	38	\boxslash (▣)	32
\BNxx (=)	157	\boxbackslash (▢)	38	\boxslash (▢)	39
\BNxxx (≡)	157	\boxbar (■)	32	\boxslash (▢)	38
\Bo (□)	157	\boxbar (■)	39	\boxslash (▢)	38
body-text symbols	14–29	\boxbar (■)	39	\boxtimes (▣)	37
boisik (package)	35, 39, 48, 60, 66, 71, 74, 86, 87, 99–102, 111, 123, 125, 147, 151, 159, 163, 247	\boxbar (■)	37	\boxtimes (▢)	31
bold symbols	240–241	\boxbot (▣)	37	\boxtimes (▢)	39
\boldmath	241	\boxbot (▣)	39	\boxtimes (▢)	38
\boldsymbol	241	\boxbox (▣)	32	\boxtimes (▢)	38
\BOLogo (BO)	182	\boxbox (▣)	32	\boxtimes (▢)	40
\BOLogoL (Technische Universität Berlin of Applied Sciences BO)	182	\boxbox (▣)	39	\boxtop (▣)	37
\BOLogoP (BO)	182	\boxbox (▣)	38	\boxtop (▣)	39
bomb	197–198	\boxbox (▣)	38	\boxtriangle (▣)	39
\bomb (💣)	182	\boxbslash (▣)	32	\boxtriangleup (▣)	37
\bond (→)	138	\boxbslash (▣)	39	\boxvert (■)	38
Boolean domain (B)	see alphabets, math	\boxbslash (▣)	39	\boxvert (▢)	38
Boolean logic gates	135	\boxcirc (▣)	37	\boxvoid (□)	37
boondox (emf package option)	131	\boxcircle (▣)	32	\boy (♂)	132
borders	209–217	\boxcircle (▣)	39	\Bpa (‡)	157
born	see \textborn	\boxcoasterisk (✳)	37	\Bpaiii (✉)	157
\boseDistrib (§)	138	\boxdiag (▣)	39	\BPamphora (疔)	158
\Bosnia (•)	194	\boxdiag (▣)	40	\BParrow (»)	158
\boson (♪)	138	\boxdiv (▣)	37	\BPbarley (՚)	158
bosons	137	\boxdivision (▣)	39	\BPbilly (՞)	158
\Bot (⊤)	102	\boxdot (▣)	37	\BPboar (🐗)	158
\bot (⊥)	30, 100, 232	\boxdot (▣)	31, 32	\BPbronze (✉)	158
\bot (⊥)	101	\boxdot (▣)	39	\BPbull (՚)	158
\bot (⊥)	100	\boxdot (▣)	38	\BPCauldroni (Ռ)	158
\bot (⊥)	101	\boxdot (▣)	38	\BPCauldronei (Ռ)	158
\botborder (⊥)	188	\boxdot (▣)	40	\BPchariot (՚)	158
\botdoteq (≡)	54	\boxdotLeft (↔▣)	76	\BPchassis (՚)	158
\botsemicircle (○)	148	\boxdotleft (↔▣)	76	\Bpcloth (՚)	158
\bottle (◑)	196	\boxdotRight (⇒▣)	76	\Bpcow (՚)	158
\Bottomheat (▣)	196	\boxdotright (⇒▣)	76	\Bpcup (՚)	158
\Bouquet (✿)	182	\boxempty (□)	32	\Bpe (Է)	157
\bowl (Ո)	196	\boxLeft (↔▣)	76	\Bpewe (՚)	158
\Bowtie (❖)	181	\boxleft (▣)	39	\Bpfoal (՚)	158
\bowtie (❖)	52	\boxleft (▣)	39	\Bpgoat (՚)	158
\bowtie (❖)	35	\boxminus (▣)	37	\Bpgoblet (՚)	158
\bowtie (❖)	35, 57	\boxminus (▣)	31	\Bpgold (՚)	158
\bowtie (❖)	33, 34	\boxminus (▣)	39	\Bphorse (՚)	158
\bowtie (❖)	61	\boxminus (▣)	38	\Bpi (՚)	157
\Box (□)	124	\boxonbox (▣)	148	\Bpmam (՚)	158
\Box (□)	124	\boxplus (▣)	37	\Bpnanny (՚)	158
\Box (□)	39	\boxplus (▣)	31	\Bpo (՚)	157
\Box (□)	38	\boxplus (▣)	39	\Bpolive (՚)	158
\Box (□)	149	\boxplus (▣)	38	\Bpox (՚)	158
box-drawing symbols	190	\boxplus (▣)	40	\Bpig (՚)	158
\boxast (▣)	32	\boxRight (⇒▣)	76	\Bpram (՚)	158
\boxast (▣)	39	\boxright (▣)	37	\Bpsheep (՚)	158
\boxast (✳)	40	\boxright (⇒▣)	76	\Bpsow (՚)	158
\boxasterisk (✳)	37	\boxright (▣)	39		

\BPspear (⟨)	158
\BPsword (⚔)	158
\BPtalent (🗡)	157
\Bpte (🗡)	157
\Bpu (မိ)	157
\Bpui (ဿ)	157
\BPvola (၁)	157
\BPvolb (ပဲ)	157
\BPvolcd (တ)	157
\BPvolcf (ဂဲ)	157
\BPwheat (ဧ)	158
\BPwheel (ၢ)	158
\BPwine (ၣ)	158
\BPwineiih (ၤ)	158
\BPwineiih (ၤ)	158
\BPwineivh (ၤ)	158
\BPwoman (ၤ)	158
\BPwool (ၩ)	158
\BPwta (ၤ)	157
\BPwtb (ၤ)	157
\BPwtc (ၤ)	157
\BPwtd (ၤ)	157
\Bqa (ၤ)	157
\Bqe (ၤ)	157
\Bqi (ၤ)	157
\Bqo (ၤ)	157
\Bra (ၤ)	157
bra	103
\braceeld (ၤ)	235
\bracerd (ၤ)	235
braces	14, 104–107, 112–115 <ul style="list-style-type: none"> asymmetric extensible multiline
\bracevert (ၤ)	104
\bracevert (ၤ)	105
\bracevert (ၤ)	126
brackets	see delimiters
\Braii (ၤ)	157
\Braiii (ၤ)	157
braket (package)	103
\Bratpfanne (ၤ)	196
\Bre (ၤ)	157
\Break (Break)	134
\breve (ၤ)	111
\breve (ၤ)	110
\breve (ၤ)	24
breve (ၤ)	see accents
\brevis (ၤ)	189
\Bri (ၤ)	157
\Bro (ၤ)	157
\Broii (ၤ)	157
\brokenvert (ၤ)	181
Bronger, Torsten	232
\Bru (ၤ)	157
\BS (ၤ)	135
\Bsa (ၤ)	157
\Bse (ၤ)	157
\BSEfree (ၤ)	136
\Bsi (ၤ)	157
\bsimilarleftarrow (ၤ)	87
\bsimilarrightarrow (ၤ)	87
\Bso (ၤ)	157
\bsolhsub (ၤ)	67
\BSpace (ၤ)	134
\Bsu (ၤ)	157
\Bswa (ၤ)	157
\Bswi ([ၤ])	157
\Bta (ၤ)	157
\Btaii (ၤ)	157
\Bte (ၤ)	157
\Bti (ၤ)	157
\btimes (ၤ)	35
\btimes (ၤ)	36
\Bto (ၤ)	157
\Btu (ၤ)	157
\Btwe (ၤ)	158
\Btwo (ၤ)	157
\Bu (ၤ)	157
\BUFd (ၤ)	135
buffers	135
\BUFl (ၤ)	135
\BUFr (ၤ)	135
\BUFu (ၤ)	135
\BUUi (ၤ)	158
\BUUi (ၤ)	158
\BUiii (ၤ)	158
\BUiv (ၤ)	158
\BUix (ၤ)	158
\Bulgaria (ၤ)	194
\bullcntr (package)	185, 247, 248
\bullcntr{<1>} (•)	185
\bullcntr{<2>} (••)	185
\bullcntr{<3>} (•••)	185
\bullcntr{<4>} (••••)	185
\bullcntr{<5>} (•••••)	185
\bullcntr{<6>} (••••••)	185
\bullcntr{<7>} (•••••••)	185
\bullcntr{<8>} (••••••••)	185
\bullcntr{<9>} (•••••••••)	185
\bullenum (package)	185
bulletum	185
\bullet (•)	31
\bullet (•)	39
\bullet (•)	33
\bullet (•)	40
bullseye	see \textbullseye
\bullseye (ၤ)	148
\Bumpedeq (ၤ)	54
\bumpdeq (ၤ)	54
\Bumpeq (ၤ)	52
\Bumpeq (ၤ)	60
\Bumpeq (ၤ)	57
\Bumpeq (ၤ)	55
\Bumpeq (ၤ)	61
\bumpeq (ၤ)	52
\bumpeq (ၤ)	60
\bumpeq (ၤ)	57
\bumpeq (ၤ)	55
\bumpeq (ၤ)	61
\bumpeqq (ၤ)	57
\bumpeqq (ၤ)	61
\upperhand (ၤ)	186
	
\Burns (ၤ)	189
\BusWidth (ၤ)	135
\BUv (ၤ)	158
\BUvi (ၤ)	158
\BUvii (ၤ)	158
\BUviii (ၤ)	158
\BUx (ၤ)	158
\BUxi (ၤ)	158
\BUxii (ၤ)	158
\Bwa (ၤ)	157
\Bwe (ၤ)	157
\Bwi (ၤ)	157
\Bwo (ၤ)	157
\BX (ၤ)	134
\Bza (ၤ)	157
\Bze (ၤ)	157
\Bzo (ၤ)	157
C	
\C (ၤ)	21
\C (ၤ)	188
c (esvect package option)	115
\c (ၤ)	21, 243
\c (ၤ)	188
\Ca (ၤ)	158
\caesura ()	164
cal (emf package option)	131
calligra (package)	128, 247, 248
calligra (emf package option)	131
Calligra (font)	128

\calrsfs (package)	128
\CAN (↑)	135
cancel (package)	112
\Cancer (♋)	132
\Cancer (♏)	133
\cancer (♋)	131
\Candle (🕯)	197
\candra (ঢ)	111
\Cap (߱)	31
\Cap (߲)	35
\Cap (߳)	35
\Cap (ߴ)	34
\Cap (ߵ)	36
\cap (߱)	33
\cap (߲)	31
\cap (߳)	35
\cap (ߴ)	34
\cap (ߵ)	33
\cap (߶)	36
\capbarcup (߷)	36
\capdot (߱)	34
\capdot (߲)	33
\capdot (߳)	36
\capdot (ߴ)	36
\capdot (ߵ)	36
\capdot (߶)	36
\capplus (߱)	34
\capplus (߲)	33
\Capricorn (♑)	132
\Capricorn (♒)	133
\capricornus (♑)	131
\capturesymbol (✖)	186
\capwedge (߱)	36
card suits	151, 152, 197–198
cardinality	see \aleph
care of (%)	126
caret	see \^
\caretinsert (܂)	126
Carlisle, David	1, 246
caron (܂)	see accents
carriage return	229
carriage return	134, 135, 152, 229
\carriagereturn (↔)	86
\carriagereturn (↔)	87
\carriagereturn (↔)	152
Cartesian product	see \times
castle	187, 224–226
\castlingchar (O)	186
\castlinghyphen (-)	186
\Cat (܂)	196
\catal (܂)	189
\Catalexis (܂)	188
\catalexis (܂)	188
catamorphism see \llparenthesis and \rrparenthesis
\CB (܂)	134
\cb (܂)	25
\Cc ()	188
\cc (©)	28
\cc (॥)	188
\ccAttribution (ⓘ)	28
\ccbyle (BY)	28
\ccbyncnd (CC BY SA)	28
\Ccc ()	188
\ccCopy (ⓘ)	28
ccicons (package)	28, 247, 248
cclicenses (package)	28, 247
\ccLogo (ⓘ)	28
\ccnc (܂)	28
\ccnd (܂)	28
\ccNoDerivatives (܂)	28
\ccNonCommercial (܂)	28
\ccNonCommercialEU (܂)	28
\ccNonCommercialJP (܂)	28
\ccPublicDomain (܂)	28
\ccRemix (ⓘ)	28
\ccsa (܂)	28
\ccSampling (܂)	28
\ccShare (܂)	28
\ccShareAlike (܂)	28
\ccwundercurvearrow (܂)	87
\ccZero (܂)	28
\cdot (.)	31, 230
\cdot (.)	35
\cdot (.)	34, 120
\cdot (...)	120
\cdot (.)	33, 120
\cdot (.)	120
\cdototp (.)	119
\cdototp (...)	120
\cdototp (.)	120
\cdotdots (...)	119
\cdotdots (...)	120
\cdotdots (...)	120
\cdotdots (...)	120
\cdotdots (...)	120
\cdotCE (Γ)	134
\Ce (✖)	158
Cedi	see \textcolonmonetary
cedilla (܂)	see accents
celestial bodies	131–133, 191, 206–209
\celsius (°C)	130
\Celtcross (⊕)	182
Celtic knots	213–217
\cent (ߵ)	26
\centerdot (■)	33
\centerdot (.)	34
\centerdot (.)	31
\centerdot (.)	35
\centerdot (.)	120
centernot (package)	232
\centernot	232
centigrade	see \textcelsius
\centre (田)	186
cents	see \textcent
\Ceres (܂)	133
\CEsign (€€)	136
\Cga (܂)	158
\Chair (܂)	197
chancery (package)	247
\changenotsign	54
\char	229, 239, 242, 245, 246
Charter (font)	26, 51
\check (܂)	111
\check (܂)	110
check marks	15, 125–126, 143, 144, 152, 181, 182, 199–202, 227
\checked (✓)	181
\CheckedBox (☒)	143
\Checkedbox (☒)	143
\Checkmark (✓)	143
\checkmark (✓)	15
\checkmark (✓)	152
\checkmark (✓)	125
\checkmark (✓)	125
\checkmark (✓)	125
\checkmark (✓)	126
\checkmark (✓ vs. ✓)	227
\CheckmarkBold (✓)	143
\checksymbol (+)	186
chemarr (package)	116, 247
chemarrow (package)	91, 117, 247
\chemarrow (→)	91
Chen, Raymond	249
chess symbols	186, 187, 224–226
\chesscomment (RR)	186
\chessetc ()	186
\chesssee (—)	186
chevrons	141
\Chi (X)	97
\chi (χ)	97
\chNAe (package)	26, 96, 129, 191, 192
china2e (package)	128, 247, 248
\Chiron (܂)	133
\chiup (χ)	98
chorus (emf package option)	131
\Ci (✖)	158
cipher symbols	191
\cirbot (߱)	61
\circ (o)	31, 126, 231
\circ (o)	39
\circ (o)	33
\circ (o)	148, 149
\circeq (⊐)	54
\circeq (⊑)	52
\circeq (⊒)	60
\circeq (⊓)	57
\circeq (⊔)	55
\circeq (⊕)	61
\CIRCLE (●)	146
\Circle (○)	146

\Circle (\circlearrowleft)	149
\Circle (\circlearrowright)	227
\circlearrowleft (\circlearrowleft)	76
\circlearrowleft (\circlearrowleft)	75
\circlearrowleft (\circlearrowleft)	86
\circlearrowleft (\circlearrowleft)	82
\circlearrowleft (\circlearrowleft)	78
\circlearrowleft (\circlearrowleft)	87, 89
\circlearrowright (\circlearrowright)	76
\circlearrowright (\circlearrowright)	75
\circlearrowright (\circlearrowright)	86
\circlearrowright (\circlearrowright)	82
\circlearrowright (\circlearrowright)	78
\circlearrowright (\circlearrowright)	87, 89
\circlebottomhalfblack (\bullet)	148
circled numerals	144, 187, 188, 224
\CircledA (\circledast)	182
\circledast (\circledast)	31
\circledast (\circledast)	39
\circledast (\circledast)	39
\circledast (\circledast)	38
\circledast (\circledast)	40
\circledbar (\circledcirc)	32
\circledbslash (\circledcirc)	32
\circledbullet (\bullet)	148
\circledcirc (\circledcirc)	31
\circledcirc (\circledcirc)	39
\circledcirc (\circledcirc)	39
\circledcirc (\circledcirc)	38
\circledcirc (\circledcirc)	40
\circleddash (\circledcirc)	31
\circleddash (\circledcirc)	39
\circleddash (\circledcirc)	39
\circleddash (\circledcirc)	38
\circleddash (\circledcirc)	40
\circleddash (\circledcirc)	38
\circleddash (\circledcirc)	39
\circleddash (\circledcirc)	39
\circleddash (\circledcirc)	39
\circleddash (\circledcirc)	38
\circleddash (\circledcirc)	40
\circleddot	see \odot
\circleddotleft (\circlearrowleft)	76
\circleddotright (\circlearrowright)	76
\CircledEq (\circledeq)	60
\circledequal (\circledeq)	39
\circledequal (\circledeq)	40
\circledgtr (\circledgt)	53
\circledless (\circledlt)	53
\circledminus	see \ominus
\circledotleft	see \circleddotleft
\circledotright	see \circleddotright
\circledownarrow (\circlearrowdown)	148
\circleddparallel (\circlearrowparallel)	40
\circleddplus	see \oplus
\circledR (\circledR)	15, 100
\circledR (\circledR)	101
\circledrightdot (\circlearrowright)	148
\circledS (\circledS)	100
\circledS (\circledS)	101
\circledslash	see \oslash
\circledstar (\circledstar)	148
\circledtimes	see \otimes
\circledtwodots (\circledcirc)	148
\circledvee (\circlearrowup)	32
\circledvert (\circlearrowup)	39
\circledvert (\circlearrowup)	40
\circledwedge (\circlearrowup)	32
\circledwhitebullet (\circledcirc)	148
\circlehbar (\circlearrowright)	40
\circleleft (\circlearrowleft)	76
\circlelefthalfblack (\bullet)	148
\circlellquad (\circlearrowright)	148
\circlelrquad (\circlearrowright)	148
\circleonleftarrow (\circlearrowleft)	88
\circleonrightarrow (\circlearrowright)	88
\circleright (\circlearrowright)	76
\circlerighthalfblack (\bullet)	148
circles	133, 146–152, 187, 188, 193, 204–206, 210–211, 222
\CircleShadow (\circlearrowleft)	150
\CircleSolid (\bullet)	150
\circletophalfblack (\bullet)	148
\circleulquad (\circlearrowright)	148
\circleurquad (\circlearrowright)	148
\circleurquadblack (\bullet)	148
\circlevertfill (\circlearrowright)	149
\Circpipe (\circlearrowright)	136
\circcplus (\circlearrowright)	33
\circcplus (\circlearrowright)	35
\Circsteel (\bullet)	136
circumflex ($\hat{}$)	see accents
\circumflexus ($\hat{}$)	24
\cirE (\circledcirc)	149
\circfnint (\circlearrowright)	49
\circfnintsl (\circlearrowright)	50
\circfnintup (\circlearrowright)	50
\cirmid (\circlearrowright)	94
\cirmid (\circlearrowright)	61
\circrscir (\circlearrowright)	149
\Cja (\circlearrowright)	158
\Cjo (\circlearrowright)	158
\Cka (\circlearrowright)	158
\Cke (\circlearrowright)	158
\Cki (\circlearrowright)	158
\Cko (\circlearrowright)	158
\Cku (\circlearrowright)	158
\Cla (\circlearrowright)	158
\Cle (\circlearrowright)	158
\CleaningA (\circlearrowright)	182
\CleaningF (\circlearrowright)	182
\CleaningFF (\circlearrowright)	182
\CleaningP (\circlearrowright)	182
\CleaningPP (\circlearrowright)	182
\clefC ($\text{\textit{B}}$)	167
\clefCInline	167
\clefF ($\text{\textit{D}}$)	167
\clefFInline	167
\clefG ($\text{\textit{G}}$)	167
\clefGInline	167
clefs	164, 165, 167, 172, 197–198
\Cli (\leq)	158
\clickb (\circlearrowright)	19
\clickc (\circlearrowright)	19
\clickt (\circlearrowright)	19
\Clo (+)	158
clock (package)	184, 247, 248
\clock (\circlearrowright)	181
\clock (\circlearrowright)	184
clock symbols	181–184, 197–198
\ClockFramefalse	184
\ClockFrametrue	184
\ClockLogo (\circlearrowright)	182
\ClockStyle	184
\clocktime	184
\closedcurlyvee (\circlearrowright)	33
\closedcurlywedge (\circlearrowright)	33
\closedequal (\equiv)	55
\closedniomega (\circlearrowright)	19
\closedprec (\circlearrowright)	55
\closedrevespsilon (\circlearrowright)	19
\closedsucc (\circlearrowright)	55
\closedvarcap (\circlearrowright)	36
\closedvarcup (\circlearrowright)	36
\closedvarcupsmashprod (\circlearrowright)	36
\closure (\circlearrowright)	110
\closure (\circlearrowright)	58, 95
\closure (\circlearrowright)	61
\Cloud (\circlearrowright)	183
clouds	40
clovers	145
\Clu (\circlearrowright)	158
clubs	151, 152
\clubsuit (\clubsuit)	151
\Cma (\circlearrowright)	158
\Cme (\circlearrowright)	158
\Cmi (\circlearrowright)	158
cml (package)	30, 37, 52, 64, 102, 247
\Cmo (\circlearrowright)	158
cmr (emf package option)	131
\Cmu (\circlearrowright)	158
\Cna (\circlearrowright)	158
\Cne (\circlearrowright)	158
\Cni (\circlearrowright)	158
\Cno (\circlearrowright)	158
\Cnu (\circlearrowright)	158

\Co (⌚)	134
\Co (⌚)	158
\coAsterisk (*)	33
\coAsterisk (*)	35
\coasterisk (*)	33
\Coda (⌚)	164
\coda (⌚)	164
code page 1252	244
table	244
code page 437	135, 190, 242
\Coffeecup (☕)	182, 197
\coh (⌚)	64
coins, ancient	27
\Colon (:)	120
\Colon (:)	120
\colon	119
\colon (:)	119
\colon (:)	120
\colon (:)	120
\Colonapprox (≈)	53
\Colonapprox (≈)	62
\colononapprox (≈)	64
\colononapprox (≈)	62
\colononapprox (≈)	53
\coloncolon (:)	64
\coloncolonapprox (≈)	64
\coloncolonquals (:=)	64
\coloncolonminus (:-)	64
\coloncolonlonsim (≈)	64
\Coloneq (:=)	53
\Coloneq (:-)	62
\Coloneq (==)	61
\coloneq (:=)	30, 54
\coloneq (:-)	62
\coloneq (==)	53
\coloneq (==)	57
\coloneq (==)	55
\coloneq (==)	61
\Coloneqq (==)	53
\Coloneqq (==)	62
\coloneqq (==)	62
\coloneqq (==)	30, 53
\coloneqq (==)	58
colonequals (package)	30, 64, 247, 248
\colonequals (==)	30, 64
\colonminus (:-)	64
\Colonsim (≈)	53
\Colonsim (≈)	62
\colonsim (≈)	64
\colonsim (≈)	62
\colonsim (≈)	53
combelow (package)	25, 247, 248
combinatorial logic gates	135
comma-below accent (⌚)	see accents
\commaminus (÷)	36
communication symbols	136
commutative diagrams	233
comp.text.tex (newsgroup)	12, 30, 31, 229–235
compass	204–206
\compensation (≈)	186
\complement (⌚)	100
\complement (⌚)	100
\complement (⌚)	101
\complement (⌚)	101
\complement (⌚)	46
\complement (⌚)	101
complete shuffle product (⊠)	37
\COMPLEX (⌚)	96
\Complex (⌚)	96
complex numbers (⌚)	see alphabets, math
composed accents	21
Comprehensive T <small>E</small> X Archive Network	1, 12, 112, 129, 135, 226, 244–246
computer hardware symbols	134
computer keys	134
Computer Modern (font)	92, 226, 228, 242
computer symbols	199–202
\ComputerMouse (🖱)	134
\concavediamond (◊)	40
\concavediamondtickleleft (◊)	40
\concavediamondtickright (◊)	40
\Conclusion (⇒)	122
\conductivity (⌚)	138
\cong (≡)	52
\cong (≡)	60
\cong (≡)	57
\cong (≡)	55
\cong (≡)	61
\congdot (≈)	61
\Congruent (≡)	122
congruent	see \equiv
\conictaper (▷)	126
\conjquant (ℳ)	48
\conjquant (ℳ)	49
\Conjunction (σ)	133
\conjunction (σ)	131
conjunction, logical	see \wedge and \&
consequence relations	63
contradiction symbols	30, 95
control characters	135
converse implication	see \leftarrow and \subset
converse nonimplication	see \leftarrow and \nsubset
\convolution (*)	33
\convolution (*)	35
\cooker (⌚)	196
cooking symbols	196, 199–202
cookingsymbols (package)	196, 247, 248
\Cooley (⌚)	196
\Coppa (⌚)	159
\coppa (⌚)	159
\coprod (Π)	30, 42
\coprod (Π)	47
\coprod (Π)	46
\coprod (Π)	48
copyright	14, 15, 27, 28, 243
\copyright (⌚)	15
\copyright (⌚)	15
\corner (⌜)	25
corners, box	190
\corona (⌚)	189
\coronainv (⌚)	189
\Corresponds (≡)	122
\corresponds (≡)	54
\corresponds (≡)	60
\cos (cos)	96, 240
\cosh (cosh)	96
\cot (cot)	96
\coth (coth)	96
\counterplay (⊣)	186
countries	194
European	194
CountriesOfEurope (package)	194, 247, 248
CountriesOfEurope (font)	195
\CountriesOfEuropeFamily	195
Courier (font)	26
\covbond (↔)	138
CP1252	see code page 1252
CP437	see code page 437
\Cpa (†)	158
\Cpe (⌚)	158
\Cpi (⌚)	158
\Cpo (⌚)	158
\Cpu (⌚)	158
\CR (⌚)	134, 135
\cr	231
\Cra (⌚)	158
\Cre (⌚)	158
Creative Commons licenses	27, 28
crescent (fge package option)	111
\creschairpin (↔)	168
\Cri (⌚)	158
\Cro (⌚)	158
\Croatia (⌚)	194
\Cross (†)	182
\Cross (†)	143
\Cross (×)	149
\Cross (×)	150

\Cross (\dagger vs. \ddagger vs. \times)	227
\cross ($*$)	162
cross ratio	see \textrecip
\crossb (\flat)	19
\CrossBoldOutline (\ddagger)	143
\CrossCloverTips ($\ddagger\ddagger$)	143
\crosssd (\bar{d})	19
\CrossedBox (\boxtimes)	143
\CrossedBox (\boxtimes)	143
\Crossedbox (\boxtimes)	143
crosses	143, 173–178, 182, 187, 188, 204–206
\crossh (\bar{h})	19
\crossing (\bowtie)	57
\CrossMaltese (\boxplus)	143
\crossnilambda (λ)	19
\CrossOpenShadow (\ddagger)	143
\CrossOutline (\ddagger)	143
crotchet	see musical symbols
\crotchet (\downarrow)	166
\crotchetDotted (\downarrow)	166
\crotchetDottedDouble ($\downarrow\downarrow$)	166
\crotchetDottedDoubleDown ($\downarrow\downarrow\downarrow$)	166
\crotchetDottedDown ($\downarrow\downarrow$)	166
\crotchetDown ($\downarrow\downarrow$)	166
\crotchetRest ($\downarrow\downarrow$)	168
\crotchetRestDotted ($\downarrow\downarrow$)	168
\crtilde (\tilde{c})	23
\Cru ()()	158
crucifixes	143, 182, 204–206
\Crux (\dagger)	110
\crux (\dagger)	110
cryst (package)	222, 247
crystallography symbols	222
\CS (\textcircled{S})	134
\Csa (\textcircled{V})	158
\csc (csc)	96
\Cse (\textcircled{H})	158
\cshuffle ($\boxplus\boxminus$)	37
\Csi ($\textcircled{\pm}$)	158
\Cso ($\textcircled{\equiv}$)	158
\Csu ($\textcircled{\geq}$)	158
\csub ($\textcircled{\sqsubseteq}$)	67
\csube ($\textcircled{\sqsubseteq}$)	67
\csup ($\textcircled{\triangleright}$)	67
\csupe ($\textcircled{\triangleright}$)	67
\Cta ($\textcircled{+}$)	158
CTAN	see Comprehensive TeX Archive Network
\Cte ($\textcircled{\downarrow}$)	158
\Cti ($\textcircled{\uparrow}$)	158
\Cto (\textcircled{F})	158
\Ctrl (\textcircled{Ctrl})	134
\Ctu (\textcircled{F})	158
\Cu (\textcircled{Y})	158
\Cube ($\square\square\square\square\square\square$)	183, 229
cube root	see \sqrt
cube rotations	203
\Cup (\textcircled{U})	31
\Cup (\textcircled{U})	35
\Cup (\textcircled{U})	35
\Cup (\textcircled{U})	34
\Cup (\textcircled{U})	36
\cup (\cup)	33
\cup (\cup)	31, 230, 239
\cup (\cup)	35
\cup (\cup)	34
\cup (\cup)	33
\cup (\cup)	36
\cupbarcap (\textcircled{U})	36
\cupdot (\cup)	34
\cupdot (\cup)	33
\cupdot (\cup)	36
\Cupido (\textcircled{L})	133
\cupleftarrow (\cup)	35, 86
\cupleftarrow (\cup)	36
\cupovercap (\textcircled{U})	36
\cupplus (\cup)	34, 35
\cupplus (\cup)	33, 34
\cupvee (\cup)	36
\curlyc (\textcircled{c})	19
\curlyeqprec (\ll)	54
\curlyeqprec (\ll)	52
\curlyeqprec (\ll)	60
\curlyeqprec (\ll)	58
\curlyeqprec (\ll)	55
\curlyeqprec (\ll)	61
\curlyeqsucc (\gg)	54
\curlyeqsucc (\gg)	52
\curlyeqsucc (\gg)	60
\curlyeqsucc (\gg)	58
\curlyeqsucc (\gg)	55
\curlyeqsucc (\gg)	61
\curlyesh (\textcircled{f})	19
\curlyvee (\textcircled{Y})	33
\curlyvee (\textcircled{Y})	31
\curlyvee (\textcircled{Y})	35
\curlyvee (\textcircled{Y})	34
\curlyvee (\textcircled{Y})	33
\curlyvee (\textcircled{Y})	36
\curlyveedot (\textcircled{y})	33
\curlyveedownarrow (\textcircled{Y})	32
\curlyveedownarrow (\textcircled{A})	86
\curlyveeuparrow (\textcircled{Y})	32
\curlyveeuparrow (\textcircled{Y})	86
\curlywedge ($\textcircled{\wedge}$)	33
\curlywedge ($\textcircled{\wedge}$)	31
\curlywedge ($\textcircled{\wedge}$)	35
\curlywedge ($\textcircled{\wedge}$)	34
\curlywedge ($\textcircled{\wedge}$)	33
\curlywedge ($\textcircled{\wedge}$)	36
\curlywedgedot ($\textcircled{\wedge}$)	33
\curlywedgedownarrow ($\textcircled{\wedge\wedge}$)	32
\curlywedgedownarrow ($\textcircled{\wedge\wedge}$)	86
\curlywedgeuparrow ($\textcircled{\wedge\wedge}$)	32
\curlywedgeuparrow ($\textcircled{\wedge\wedge}$)	86
\curlyyyogh (\textcircled{z})	19
\curlylyz (\textcircled{z})	19
\currency (\textcircled{O})	26
currency symbols	26, 27, 126, 129
\curvearrowbotleft (\curvearrowleft)	76
\curvearrowbotleft (\curvearrowleft)	86
\curvearrowbotleftright ($\curvearrowleft\curvearrowright$)	76
\curvearrowbotleftright ($\curvearrowleft\curvearrowright$)	86
\curvearrowbotright (\curvearrowright)	76
\curvearrowbotright (\curvearrowright)	86
\curvearrowdownup ($\curvearrowdown\curvearrowup$)	77
\curvearrowleft (\curvearrowleft)	76
\curvearrowleft (\curvearrowleft)	75
\curvearrowleft (\curvearrowleft)	86
\curvearrowleft (\curvearrowleft)	82
\curvearrowleft (\curvearrowleft)	78
\curvearrowleft (\curvearrowleft)	88
\curvearrowleftplus ($\curvearrowleft\curvearrowright$)	88
\curvearrowleftright ($\curvearrowleft\curvearrowright$)	76
\curvearrowleftright ($\curvearrowleft\curvearrowright$)	86
\curvearrowleftright ($\curvearrowleft\curvearrowright$)	77
\curvearrownesw ($\curvearrownw\curvearrowse$)	77
\curvearrownwse ($\curvearrownw\curvearrowse$)	77
\curvearrowright (\curvearrowright)	76
\curvearrowright (\curvearrowright)	75
\curvearrowright (\curvearrowright)	86
\curvearrowright (\curvearrowright)	82
\curvearrowright (\curvearrowright)	78
\curvearrowright (\curvearrowright)	88
\curvearrowrightleft ($\curvearrowright\curvearrowleft$)	77
\curvearrowrightminus ($\curvearrowright\curvearrowright$)	88
\curvearrowsenw ($\curvearrownw\curvearrownw$)	77
\curvearrowswne ($\curvearrownw\curvearrowse$)	77
\curvearrowupdown ($\curvearrowup\curvearrowdown$)	77
\CutLeft (\textcircled{x})	141
cutoff subtraction	see \dotdiv
\CutRight (\textcircled{x})	141
\CuttingLine (--)	141
\Cwa ()()	158
\cwcirclearrow (\textcircled{O})	88
\cwcirclearrowdown (\textcircled{O})	81
\cwcirclearrowleft (\textcircled{Q})	81
\cwcirclearrowright (\textcircled{O})	81
\cwcirclearrowup (\textcircled{O})	81
\Cwe (\textcircled{I})	158
\cwgapcirclearrow (\textcircled{C})	82
\cwgapcirclearrow (\textcircled{C})	88
\Cwi ()()	158
\cyleftarcarrow (\textcircled{l})	81
\cwneararrow (\textcircled{v})	81

\DEL (\triangleleft)	135	\diagup (/)	124	\DiamondShadowC (\diamondsuit)	149
\DEL (\triangleright)	135	\diagup (/)	125	\Diamondshape (\diamond)	149
\Del (\blacksquare)	134	\diagup (/)	56	\diamondandslash ($\diamond\swarrow$)	38
\Del (\blacksquare)	134	\diagup (/)	126	\diamondandslash ($\diamond\searrow$)	38
\Deleatur <i>see</i> \Denarius		\diameter (\emptyset)	124	\DiamondSolid (\blacklozenge)	150
delimiters	102–110	\diameter (\emptyset)	30	\diamondandsuit ($\diamond\spadesuit$)	151
text-mode	110	\diameter (\emptyset)	125	\diamondandsuit ($\diamond\clubsuit$)	151
variable-sized	103–109	\diameter (\emptyset)	125	\diamondandsuit ($\diamond\heartsuit$)	151
wavy-line	104–108	\diameter (\emptyset)	126	\diamondandsuit ($\diamond\lozenge$)	151
\Delta (Δ)	97	\diameter (\emptyset)	181	\diamondandsuit ($\diamond\spadesuit$)	151
\delta (δ)	97	\Diamond (\diamond)	124	\diamondandtimes ($\diamond\otimes$)	39
\deltaaup (δ)	98	\Diamond (\diamond)	124	\diamondandtimes ($\diamond\bowtie$)	38
deminutum <i>see</i> musixgre		\Diamond (\diamond)	39	\diamondandtimes ($\diamond\bowtie$)	38
demisemiquaver <i>see</i> musical		\Diamond (\diamond)	38	\diamondandtopblack (\blacklozenge)	149
symbols		\Diamond (\diamond)	149	\diamondandtriangle ($\diamond\triangle$)	39
\demisemiquaver (♪)	166	\diamondandtriangle ($\diamond\triangle$)	39	\diamondandvert ($\diamond\downarrow$)	38
\demisemiquaverDotted (♪.)	166	\diamondandvert ($\diamond\downarrow$)	38	\diatop	25, 234
\demisemiquaverDottedDouble		\diamondandvert ($\diamond\downarrow$)	38	\diaunder	25, 234
(♪.)	166	\diamondandvert ($\diamond\downarrow$)	40, 149	dice	183, 184, 223, 229
\demisemiquaverDottedDoubleDown		\diamondbackslash ($\diamond\backslash$)	38	dice (package)	223, 247
(♪..)	166	\diamondbackslash ($\diamond\backslash$)	38	\dicei (\square)	184
\demisemiquaverDottedDown		\diamondbar ($\diamond\bar{}$)	39	\diceii (\square)	184
(♪..)	166	\Diamondblack (\blacklozenge)	124	\diceiii (\square)	184
\demisemiquaverDown (♪)	166	\diamondbotblack (\blacklozenge)	149	\diceiv (\square)	184
\Denarius (\textsterling)	26	\diamondbslash ($\diamond\backslash$)	39	\dicev (\square)	184
\denarius (\texttimes)	27	\diamondcdot ($\diamond\circ$)	39	\dicevi (\square)	184
\Denmark (\textbullet)	194	\diamondcdot ($\diamond\circ$)	149	dictionary symbols	17–20, 189
\dental (\textbar)	23	\diamondcircle ($\diamond\circ$)	39	\dictsym (package)	189, 247
\Dep ($\text{\textasteriskcenterdot}$)	164	\diamonddiamond ($\diamond\bullet$)	38	died <i>see</i> \textdied	
derivative, partial <i>see</i> \partial		\diamonddiamond ($\diamond\bullet$)	38	differential, inexact <i>see</i> \dbar	
Descartes's equal sign (\textapprox)		\Diamonddot ($\diamond\bullet$)	124	\Digamma (F)	159
. <i>see</i> \rightpropto and		\Diamonddot ($\diamond\bullet$)	38	\Digamma (F)	159
\backpropto		\Diamonddot ($\diamond\bullet$)	38	\digamma (F)	97, 159
\descnode ($\text{\textcircled{S}}$)	131	\DiamonddotLeft ($\diamond\leftrightarrow$)	76	\digamma (F)	159
\det (\det)	96	\DiamonddotLeft ($\diamond\leftrightarrow$)	76	\digamma (F)	101
\devadvantage ($\text{\textcircled{C}}$)	186	\DiamonddotRight ($\diamond\Rightarrow$)	76	\digamma (F)	159
\Dfourier ($\text{\textcircled{o}}$)	64	\DiamonddotRight ($\diamond\Rightarrow$)	76	digital logic gates	135
\Dfourier ($\text{\textcircled{o}}$)	60	\diamonddots (:.)	33, 120	digits <i>see</i> numerals	
\dfourier ($\text{\textcircled{o'}}$)	64	\DiamondLeft ($\diamond\leftrightarrow$)	76	\dim (\dim)	96
\dfourier ($\text{\textcircled{o'}}$)	60	\Diamondleft ($\diamond\leftrightarrow$)	76	\ding {17}	139, 141–145, 150, 152
\Diamond ($\text{\textcircled{D}}$)	20	\diamondleftarrow (\leftarrow)	88	\ding {33} ($\text{\textcircled{a}}$)	141
\DH ($\text{\textcircled{D}}$)	15, 243	\diamondleftarrowbar (\leftrightarrow)	88	\ding {34} ($\text{\textcircled{a}}$)	141
\dh ($\text{\textcircled{d}}$)	20	\diamondlefttblack (\blacklozenge)	149	\ding {35} ($\text{\textcircled{a}}$)	141
\dh ($\text{\textcircled{d}}$)	15, 243	\diamondminus ($\diamond-$)	39	\ding {36} ($\text{\textcircled{a}}$)	141
diacritics <i>see</i> accents		\diamondminus ($\diamond-$)	38	\ding {37} ($\text{\textcircled{a}}$)	152
\diaeresis ($\text{\textcircled{e}}$)	24	\diamondop ($\diamond\circ$)	39	\ding {38} ($\text{\textcircled{a}}$)	152
diæresis ($\text{\textcircled{e}}$) <i>see</i> accents		\diamondplus ($\diamond+$)	39	\ding {39} ($\text{\textcircled{a}}$)	152
\diagdown ($\text{\textcircled{/}}$)	124	\diamondplus ($\diamond+$)	38	\ding {40} ($\text{\textcircled{a}}$)	152
\diagdown ($\text{\textcircled{/}}$)	124	\diamondplus ($\diamond+$)	38	\ding {41} ($\text{\textcircled{a}}$)	152
\diagdown ($\text{\textcircled{/}}$)	125	\DiamondRight ($\diamond\Rightarrow$)	76	\ding {42} ($\text{\textcircled{a}}$)	142
\diagdown ($\text{\textcircled{/}}$)	56	\Diamondright ($\diamond\Rightarrow$)	76	\ding {43} ($\text{\textcircled{a}}$)	142
\diagdown ($\text{\textcircled{/}}$)	126	\diamondrightblack (\blacklozenge)	149	\ding {44} ($\text{\textcircled{a}}$)	142
\diagonal ($\text{\textcircled{/}}$)	186	diamonds	31, 33, 38–40,	\ding {45} ($\text{\textcircled{a}}$)	142
\diagup (/)	124	76, 124, 147–152, 173–178,		\ding {46} ($\text{\textcircled{a}}$)	142
		183, 204–206, 222		\ding {47} ($\text{\textcircled{a}}$)	142
				\ding {48} ($\text{\textcircled{a}}$)	142
				\ding {49} ($\text{\textcircled{a}}$)	142

\ding{50} (⌚)	142	\ding{109} (⌚)	150	\ding{202} (⌚)	144
\ding{51} (✓)	143	\ding{110} (▣)	150	\ding{203} (▣)	144
\ding{52} (✓)	143	\ding{111} (▢)	150	\ding{204} (▢)	144
\ding{53} (✗)	143	\ding{112} (▢)	150	\ding{205} (▢)	144
\ding{54} (✗)	143	\ding{113} (▢)	150	\ding{206} (▢)	144
\ding{55} (✗)	143	\ding{114} (▢)	150	\ding{207} (▢)	144
\ding{56} (✗)	143	\ding{115} (▲)	150	\ding{208} (▢)	144
\ding{57} (✚)	143	\ding{116} (▼)	150	\ding{209} (▢)	144
\ding{58} (✚)	143	\ding{117} (◆)	150	\ding{210} (▢)	144
\ding{59} (✚)	143	\ding{118} (❖)	152	\ding{211} (▢)	144
\ding{60} (✚)	143	\ding{119} (●)	150	\ding{212} (→)	139
\ding{61} (↑)	143	\ding{120} (↓)	150	\ding{213} (→)	139
\ding{62} (↑)	143	\ding{121} (↓)	150	\ding{214} (↔)	139
\ding{63} (†)	143	\ding{122} (█)	150	\ding{215} (↑)	139
\ding{64} (‡)	143	\ding{123} (●)	17	\ding{216} (↖)	139
\ding{65} (◊)	145	\ding{124} (●)	17	\ding{217} (→)	139
\ding{66} (✚)	145	\ding{125} (“)	17	\ding{218} (↗)	139
\ding{67} (✚)	145	\ding{126} (”)	17	\ding{219} (→)	139
\ding{68} (◊)	145	\ding{161} (⌚)	17	\ding{220} (→)	139
\ding{69} (◊)	145	\ding{162} (⌚)	17	\ding{221} (→)	139
\ding{70} (◆)	145	\ding{163} (⌚)	17	\ding{222} (→)	139
\ding{71} (❖)	145	\ding{164} (♥)	152	\ding{223} (➡)	139
\ding{72} (★)	145	\ding{165} (♦)	152	\ding{224} (➡)	139
\ding{73} (☆)	145	\ding{166} (♣)	152	\ding{225} (➡)	139
\ding{74} (✿)	145	\ding{167} (♠)	152	\ding{226} (→)	139
\ding{75} (★)	145	\ding{168} (♣)	152	\ding{227} (→)	139
\ding{76} (★)	145	\ding{169} (♦)	152	\ding{228} (→)	139
\ding{77} (★)	145	\ding{170} (♥)	152	\ding{229} (→)	139
\ding{78} (☆)	145	\ding{171} (♠)	152	\ding{230} (→)	139
\ding{79} (☆)	145	\ding{172} (①)	144	\ding{231} (►)	139
\ding{80} (☆)	145	\ding{173} (②)	144	\ding{232} (►)	139
\ding{81} (*)	145	\ding{174} (③)	144	\ding{233} (⇒)	139
\ding{82} (*)	145	\ding{175} (④)	144	\ding{234} (⤒)	139
\ding{83} (*)	145	\ding{176} (⑤)	144	\ding{235} (⤒)	139
\ding{84} (*)	145	\ding{177} (⑥)	144	\ding{236} (⤒)	139
\ding{85} (*)	145	\ding{178} (⑦)	144	\ding{237} (⤒)	139
\ding{86} (*)	145	\ding{179} (⑧)	144	\ding{238} (⤒)	139
\ding{87} (*)	145	\ding{180} (⑨)	144	\ding{239} (⤒)	139
\ding{88} (*)	145	\ding{181} (⑩)	144	\ding{241} (⤒)	139
\ding{89} (*)	145	\ding{182} (①)	144	\ding{242} (⤒)	139
\ding{90} (✳)	145	\ding{183} (②)	144	\ding{243} (⤒)	139
\ding{91} (*)	145	\ding{184} (③)	144	\ding{244} (⤒)	139
\ding{92} (*)	145	\ding{185} (④)	144	\ding{245} (⤒)	139
\ding{93} (*)	145	\ding{186} (⑤)	144	\ding{246} (⤒)	139
\ding{94} (*)	145	\ding{187} (⑥)	144	\ding{247} (⤒)	139
\ding{95} (✿)	145	\ding{188} (⑦)	144	\ding{248} (⤒)	139
\ding{96} (✿)	145	\ding{189} (⑧)	144	\ding{249} (⤒)	139
\ding{97} (✿)	145	\ding{190} (⑨)	144	\ding{250} (⤒)	139
\ding{98} (✿)	145	\ding{191} (⑩)	144	\ding{251} (⤒)	139
\ding{99} (*)	145	\ding{192} (①)	144	\ding{252} (⤒)	139
\ding{100} (*)	145	\ding{193} (②)	144	\ding{253} (⤒)	139
\ding{101} (*)	145	\ding{194} (③)	144	\ding{254} (⤒)	139
\ding{102} (*)	145	\ding{195} (④)	144	\dingasterisk (*)	126
\ding{103} (*)	145	\ding{196} (⑤)	144	dingautolist	144
\ding{104} (*)	145	\ding{197} (⑥)	144	dingbat (package)	141, 142, 152, 213, 227, 247
\ding{105} (*)	145	\ding{198} (⑦)	144	dingbat symbols	139–152
\ding{106} (*)	145	\ding{199} (⑧)	144	\dInnocey (✉)	197
\ding{107} (*)	145	\ding{200} (⑨)	144	\Dipole (>)	188
\ding{108} (●)	150	\ding{201} (⑩)	144		

\dipole (>)	188	
\Dipole* (>)	188	
\dipole* (>)	188	
\dipole (d^r)	138	
Dirac notation	103	
\Direct (D!)	133	
discount	see \textdiscount	
discretionary hyphen	244	
\Dish (◎)	196	
\disin (ϵ)	60	
\disin (\in)	61	
disjoint union	30	
\disjquant (W)	48	
\disjquant (W)	48	
disjunction	see \vee	
\displaystyle .	232, 233, 235, 240	
ditto marks	see \textquotedbl	
\div (\div)	31	
\div (\div)	35	
\div (\div)	34	
\div (\div)	33	
\div (\div)	36	
\divdot (\div)	33	
\divideontimes (*)	33	
\divideontimes (*)	31	
\divideontimes (*)	35	
\divideontimes (*)	34	
\divideontimes (*)	36	
\divideontimes (*)	36	
\Divides (/)	122	
\divides ()	54	
\divides (/)	56	
\DividesNot (X)	122	
division	31, 112, 114, 119 long	112, 114
	non-commutative	119
	polynomial	112
division times	see \divideontimes	
divorced	see \textdivorced	
\divslash (/)	34	
\DJ (D)	15	
\dj (d)	15	
\DL (V)	134	
\dLaughey (😊)	197	
\dlbari (t)	19	
\DLE (►)	135	
\dlsh (\leftarrow)	76	
\dlsh (\downarrow)	86	
\DM (◊)	134	
\Dmesonminus (D^-)	138	
\Dmesonnull (D^0)	138	
\Dmesonplus (D^+)	138	
\dndtstile ()	63	
\dNeutrey (😊)	197	
\dNinja (🔥)	197	
\dnststile ()	63	
\dntstile ()	63	
\dnttstile ()	63	
\dotplus (+)	63	
\dots	15	
\dots (...)	244	
dots (ellipses)	14, 15, 119–121, 124, 234	
\dotplusb (...)	119	
\dotplusb (...)	120	
\dotplusc (...)	119	
\dotseq (÷)	54	
\dotssi (...)	119	
\dotssim (~)	60	
\dotssim (~)	61	
\dotssint (f...f)	45	
\dotssint (f...f)	48	
\dotssm (...)	119	
\dotssm (...)	120	
\dotssminusdots (⋮)	58	
\dotssminusdots (⋮)	61	
\dotso (...)	119	
dotted arrows	117	
dotted union (U)	239	
\dottedcircle (○)	149	
\dottedsquare (□)	149	
\dottedtilde (˜)	23	
\dottimes (×)	33	
\dottimes (×)	35	
\dottimes (×)	34	
\dottimes (×)	36	
\double .	109	
double acute (ˇ)	see accents	
\doublebar (⋮)	162	
\doublebarvee (ˇ)	36	
\doublebarwedge (ˇ)	33	
\doublebarwedge (ˇ)	31	
\doublebarwedge (ˇ)	35	
\doublebarwedge (ˇ)	34	
\doublebarwedge (ˇ)	36	
\doublecap .	see \Cap	
\doublecap (∩)	33	
\doublecap (∩)	34, 35	
\doublecap (∩)	34	
\doublecap (∩)	36	
\doublecovbond (⌚)	138	
\doublecross (⌘)	162	
\doublecup .	see \Cup	
\doublecup (∪)	33	
\doublecup (∪)	34, 35	
\doublecup (∪)	34	
\doublecup (∪)	36	
\doublecurlyvee (₩)	34	
\doublecurlywedge (₩)	34	
\doubledot (⋮)	162	
\doubleeye (⋮)	162	
\doublefrown (⌐)	94	
\doublefrownEQ (⌐)	94	
\doublepawns (○)	186	
\doubleplus (‡)	162	
\doubleplus (#)	36	

\doublesharp (⌘)	167
\doublesmile (☺)	94
\doublesmileeq (☺)	94
\doublesqcap (⊓)	34, 35
\doublesqcap (⊔)	34
\doublesqcup (⊔)	34, 35
\doublesqcup (⊓)	33
\doublestar (★)	162
\doublethump (†)	164
\doubletilde (˜)	23
\doublevee (w)	34, 35
\doublevee (w)	33
\doublewedge (ℳ)	34, 35
\doublewedge (ℳ)	33
\DOWNarrow (▼)	181
\Downarrow (⤤)	75, 103
\Downarrow (⤤)	82
\Downarrow (⤤)	106
\Downarrow (⤤)	77
\Downarrow (⤤)	88
\Downarrow (⤤)	107
\downarrow	239
\downarrow (⤤)	75, 103
↓	
\downarrow (⤤)	106
\downarrow (⤤)	82
\downarrow (⤤)	77
\downarrow (⤤)	92
\downarrow (⤤)	107
\downarrow (⤤)	88
\downarrowbar (⤤)	88
\downarrowbarred (†)	88
\downarrowtail (⤤)	82
\downarrowtail (⤤)	77
\downAssert (⊤)	58
\downassert (⊤)	58
\downbkarrown (⤤)	82
\downblackarrow (⤤)	86
\downblackspoon (⤤)	94
\downbow (⊤)	164
\downbracketfill	235
\downdasharrow (⤤)	86
\downdasharrow (⤤)	88
\downdownarrows (⤤)	76
\downdownarrows (⤤)	75
\downdownarrows (⤤)	86
\downdownarrows (⤤)	82
\downdownarrows (⤤)	77
\downdownarrows (⤤)	88
\downdownharpoons (⤤)	77
Downes, Michael J.	96, 249
\downfilledspoon (⤤)	93
\downfishtail (⤤)	61
\downfootline (⤤)	55
\downfree (⤤)	55
\downharpoonccw (⤤)	80
\downharpooncw (⤤)	80
\downharpoonleft (⤤)	77
\downharpoonleft (⤤)	76
\downharpoonleft (⤤)	87
\downharpoonleft (⤤)	85
\downharpoonleft (⤤)	90
\downharpoonleftbar (⤤)	90
\downharpoonright (⤤)	77
\downharpoonright (⤤)	76
\downharpoonright (⤤)	87
\downharpoonright (⤤)	85
\downharpoonright (⤤)	90
\downharpoonrightbar (⤤)	90
\downharpoonsleftright (⤤)	90
\downlcurvearrow (⤤)	82
\downleftcurvedarrow (⤤)	82
\downlsquigarrow (⤤)	82
\downlsquigarrow (⤤)	77
\Downmapsto (⤤)	82
\downmapsto (⤤)	82
\downmapsto (⤤)	77
\downModels (⊤)	55
\downmodels (Π)	58
\downmodels (Π)	55
\downnp (^\circ)	25
\downnparenthfill	235
\downpitchfork (Ψ)	95
\downpitchfork (Ψ)	93
\downproto (♂)	55
\downrcurvearrow (⤤)	82
\downrightcurvedarrow (⤤)	82
\downrightcurvedarrow (⤤)	88
\downrsquigarrow (⤤)	82
\downrsquigarrow (⤤)	77
\downslice (⤤)	38
\downspoon (⤤)	94
\downspoon (⤤)	93
\downt (⤤)	25
\downtherefore (∴)	120
\downtherefore (∴)	33, 120
\downtouparrow (⤤)	76
\downtouparrow (⤤)	86
\downtriangleleftblack (⊤)	148
\downtrianglerightblack (⊤)	148
\downuparrows (⤤)	76
\downuparrows (⤤)	82
\downuparrows (⤤)	77
\downuparrows (⤤)	88
\downupcurvearrow (⤤)	82
\downupharpoons (⤤)	77
\downupharpoons (⤤)	85
\downupharpoons (⤤)	80
\downupharpoonsleftright (⤤)	85
\downupsquigarrow (⤤)	82
\downVDash (⊤)	58
\downVdash (⊤)	58
\downVdash (⊤)	55
\downvDash (⊤)	58
\downvdash (⊤)	58
\downwavearrow (⤤)	82
\downwhitearrow (⤤)	86
\downwhitearrow (⤤)	88
\downY (⤤)	34
\downY (⤤)	33
\downzigzagarrow (⤤)	86
\downzigzagarrow (⤤)	82
\downzigzagarrow (⤤)	88
Doyle, Sir Arthur Conan	220
dozenal (package)	122, 185, 247, 248
dozenal (base 12)	
numerals	122
tally markers	185
\dprime (〃)	122
\DQ (☒)	134
\dracma (ℳ)	27
\draftingarrow (⤤)	88
\drbkarow (⤤)	88
\Dreizack (⤤)	196
\droang (៥)	111
\drsh (⤤)	76
\drsh (⤤)	86
\drumclef (ℳ)	165
\drWalley (៥)	197
\DS (៥)	165
\Ds (៥)	165
៥	
\ds (៥)	164
\dSadey (☺)	197
\dsaeronautical (☒)	189
\dsagricultural (⤤)	189
\dsarchitectural (△)	189
\dsbiological (☒)	189
\DSC (D ^{sc})	133
\dschemical (៥)	189
\dscommercial (⤤)	189
\dsdststile (⤤)	63
\dSey (☺)	197
dsfont (package)	128, 247
\dsheraldic (☒)	189
\dsjuridical (⤤)	189
\dsliterary (ℳ)	189
\dsmathematical (ℳ)	189
\dsmedical (☒)	189
\dSmiley (☺)	197
\dsmilitary (☒)	189
\dsol (⤤)	36
\dsrailways (៥)	189
\dsdststile (⤤)	63
\dstchnical (☒)	189

\dststile ()	63
\dsttstile ()	63
\dsub (◁)	40
\dtbststile ()	63
\dtimes (×)	34, 35
\dtimes (×)	37
\dtimes (×)	33
\dTongey (☺)	197
\dtbststile ()	63
\DU (∩)	134
\dualmap (○○)	94
\dualmap (○○)	61
\duevolte (✗)	164
duodecimal (base 12)	
numerals	122
tally markers	185
DVI	28, 134, 238
.dvi files	244
\dVomey (✿)	197
\dWalley (✿)	197
\dWinkey (✿)	197
\dKey (✿)	197
\dz (đ)	19
E	
E (Π)	162
e (esvect package option)	115
\e (e)	101
\e (ξ)	122
e (ℳ)	162
ε-TEX	103
\Earth (⊕)	132
\Earth (δ)	132
\Earth (∇)	133
\earth (δ)	131
\eastcross (†)	143
\EastPoint (Eº)	133
\Ecommerce (⊖)	26
\eggbeater (♪)	196
\egssdot (▷)	71
\EightAsterisk (✳)	145
\EightFlowerPetal (✿)	145
\EightFlowerPetalRemoved (✿)	145
eighth note <i>see</i> musical symbols	
\eighthnote (♪)	166
\eighthnote (♪)	163
\eighthnote (♪)	163
\eighthnote (♪)	163
\eighthnote (♪)	166
\eighthNoteDotted (♪.)	166
\eighthNoteDottedDouble (♪..)	166
\eighthNoteDottedDoubleDown (♪..)	166
\eighthNoteDottedDown (♪)	166
\eighthNoteDown (♪)	166
\EightStar (✳)	145
\EightStarBold (✳)	145
\EightStarConvex (✳)	145
\EightStarTaper (✳)	145
\ejective (՞)	19
electrical impulse	130
electrical symbols	130
electromotive force	131
\electron (e⁻)	138
element of	<i>see</i> \in
elements	133
\elinters (✗)	126
\ell (ℓ)	100
\ell (ℓ)	101
\Ellipse (○)	150
ellipses (dots)	14, 15, 119–121, 124, 234
ellipses (ovals)	150, 173–178, 204–206, 210–211, 222
\EllipseShadow (○)	150
\EllipseSolid (●)	150
\elsdot (≀)	71
\EM (↓)	135
\Email (✉)	136
\EmailCT (✉)	136
\EmailCT (✉)	136
\emf (package)	131, 247, 248
\emf (ℰ)	131
\emgma (ŋ)	20
Emmentaler (font)	168
emoticons	196, 197
\empty (†)	188
empty set	123–125
\emptyset (∅)	124
\emptyset (∅)	125
\emptyset (∅)	125
\emptyset (∅)	123
\emptysetoarr (∅)	123
\emptysetoarrl (∅)	123
\emptysetobar (∅)	123
\emptysetocirc (∅)	123
\EN (τ)	134
\enclosecircle (○)	148
\enclosediamond (◇)	148
\enclosesquare (□)	148
\enclosetriangle (△)	148
\End ([End])	134
end of proof	124
\ending (⊥)	186
\eng (ŋ)	19
engineering symbols	126, 130, 136
\engma (ŋ)	20
\enleadertwodots (..)	120
\ENQ (❶)	135
entails	<i>see</i> \models
\Enter ([Enter])	134
enumerate	185
\Envelope (✉)	152
envelopes	152, 192
\enya (ɲ)	20
\EOafter (☞)	160
\EOandThen (☞)	160
\EOAppear (☞)	160
\EOBeardMask (☞)	160
\EOBedeck (☞)	160
\EOBlood (○)	160
\EObrace (☞)	160
\EObuilding (☞)	160
\EObundle (☞)	160
\EOChop (☞)	160
\EOChronI (☞)	160
\EOCloth (☞)	160
\EODealWith (☞)	160
\EODeer (☞)	160
\EOeat (☞)	160
\EOflint (☞)	160
\EOflower (☞)	160
\EOFold (☞)	160
\EOGod (□)	160
\EOGoUp (☞)	160
\EOgovernor (☞)	160
\EOGuise (☞)	160
\EOHallow (☞)	160
\EOi (◦)	161
\EOii (◦◦)	161
\EOiii (◦◦◦)	161
\EOiv (◦◦◦◦)	161
\EOix (◦◦◦◦◦)	161
\EOja (☞)	160
\EOjaguar (☞)	160
\EOje (☞)	160

\EOJI (၁၂)	160	\EOPatron (၁၃)	160	\EOsuu (၁၄)	160
\EOji (၁၅)	160	\EOPatronII (၁၅)	160	\EOT (◆)	135
\EOjo (၁၆)	161	\EOpe (၁၆)	160	\EOta (၁၇)	160
\EOju (၁၇)	161	\EOpenis (၁၇)	160	\Eote (၁၈)	160
\EOkak (၁၈)	161	\EOpip (၁၉)	160	\EOthrone (၁၉)	160
\EOke (၁၉)	161	\EOPierce (၁၀)	160	\Eoti (၂၀)	160
\EOki (၁၁)	161	\EOPlant (၁၁)	160	\EOTime (၁၁)	160
\EOkij (၁၂)	161	\EOPlay (၁၂)	160	\Eotime (၁၂)	160
\EOKing (၁၃)	161	\EOpo (၁၃)	160	\EOTtitle (၁၃)	160
\EOknottedCloth (၁၄)	161	\EOpriest (၁၄)	160	\EOTtitleII (၁၄)	160
\EOknottedClothStraps (၁၅)	161	\EOPrince (၁၅)	160	\EOTtitleIV (၁၅)	160
\EOko (၁၅)	161	\EOpup (၁၆)	160	\Eoto (၁၆)	160
\EOku (၁၇)	161	\EOpuu (၁၇)	161	\Eotu (၁၈)	160
\EOkuu (၁၉)	161	\EOpuuk (၁၉)	161	\EOtuki (၁၉)	160
\EOLetBlood (၁၂)	161	\EORain (၁၂)	161	\EOtukpa (၁၂)	160
\EOloinCloth (၁၂)	161	\EOSa (၁၂)	161	\EOturtle (၁၂)	160
\EOLongLipII (၁၂)	161	\EOsa (၁၂)	161	\EOtuu (၁၂)	160
\EOLord (၁၂)	161	\EOSacrifice (၁၂)	161	\EOtza (၁၂)	160
\EOLose (၁၂)	161	\EOSaw (၁၂)	161	\EOtze (၁၂)	160
\EOma (၁၂)	161	\EOScorpius (၁၂)	161	\EOtzetze (၁၂)	160
\EOmacaw (၁၂)	161	\EOset (၁၂)	161	\EOtzi (၁၂)	160
\EOmacawI (၁၂)	161	\EOSi (၁၂)	161	\EOtzu (၁၂)	160
\EOme (၁၂)	161	\EOsi (၁၂)	161	\EOtzuu (၁၂)	160
\EOMexNew (၁၂)	161	\EOSing (၁၂)	161	\EOundef (၁၂)	161
\EOmi (၁၂)	161	\EOSini (၁၂)	161	\EOv (၁၂)	161
\EOMiddle (၁၂)	160	\EOskin (၁၂)	161	\EOvarBeardMask (၁၂)	161
\EOmonster (၁၂)	160	\EOSky (၁၂)	161	\EOvarja (၁၂)	161
\EOMountain (၁၂)	160	\EOSkyAnimal (၁၂)	161	\EOvarji (၁၂)	161
\EOmuu (၁၂)	160	\EOSkyPillar (၁၂)	161	\EOvarki (၁၂)	161
\EOna (၁၂)	160	\EOSnake (၁၂)	161	\EOvarkuu (၁၂)	161
\EOne (၁၂)	160	\EOSo (၁၂)	161	\EOvarni (၁၂)	161
\EOni (၁၂)	160	\EOSpan (၁၂)	161	\EOvarpa (၁၂)	161
\EOnow (၁၂)	160	\EOSprinkle (၁၂)	161	\EOvarSi (၁၂)	161
\EOnu (၁၂)	160	\EOstar (၁၂)	161	\EOvarsi (၁၂)	161
\EOnuu (၁၂)	160	\EOStarWarrior (၁၂)	160	\EOvartza (၁၂)	161
\EOofficerI (၁၂)	160	\EOstarWarrior (၁၂)	161	\EOvarwuu (၁၂)	161
\EOofficerII (၁၂)	160	\EOstep (၁၂)	160	\EOvarYear (၁၂)	161
\EOofficerIII (၁၂)	160	\EOSu (၁၂)	160	\EOvi (၁၂)	161
\EOofficerIV (၁၂)	160	\EOSu (၁၂)	160	\EOvii (၁၂)	161
\EOpa (၁၂)	160	\EOSun (၁၂)	160	\EOviii (၁၂)	161
\EOpak (၁၂)	160	\EOSuu (၁၂)	160	\EOwa (၁၂)	161

\EOwuu (⤵)	161
\EOx (⤶)	161
\EOxi (⤷)	161
\EOxii (⤸)	161
\EOxiii (⤹)	161
\EOxiv (⤺)	161
\EOxix (⤻)	161
\EOxv (⤼)	161
\EOxvi (⤽)	161
\EOxvii (⤾)	161
\EOxviii (⤿)	161
\EOxx (⤿)	161
\EOya (⤾)	161
\EOyaj (⤿)	161
\EOye (⤿)	161
\EOYear (⤿)	161
\EOyuu (⤿)	161
\EOzero (⤿)	161
\EP (€)	134
\eparsl (#)	61
Epi-Olmec script	160–161
epiOlmec (package)	160, 161, 247, 248
epsdice (package)	184, 247, 248
\epsdice (⤿)	184
\epsi (ε)	20
\Epsilon (E)	97
\epsilon (ε)	97
\epsilonup (ε)	98
\eqbump (⤿)	55
\eqbumped (⤿)	54
\eqbumped (⤿)	60
\eqcirc (==)	54
\eqcirc (==)	52
\eqcirc (==)	60
\eqcirc (==)	58
\eqcirc (==)	55
\eqcirc (==)	62
\Eqcolon (=:)	53
\Eqcolon (=:)	62
\eqcolon (=:)	54
\eqcolon (=:)	62
\eqcolon (=:)	53
\eqcolon (=:)	58
\eqcolon (=:)	62
\eqdef ($\stackrel{\text{def}}{=}$)	62
\eqdot (⤿)	58
\eqdot (⤿)	55
\eqdot (⤿)	62
\eqeq (==)	62
\eqeqeq (==)	62
\eqfrown (⤿)	94
\eqgtr (⤿)	71
\eqleftrightarrow (⤿)	86
\eqless (⤿)	71
\Eqqcolon (=:)	53
\Eqqcolon (=:)	62
\eqqcolon (=:)	62
\eqqcolon (=:)	53
\eqqcolon (=:)	58
\eqqgtr (⤿)	71
\eqqlless (⤿)	71
\eqqplus (⤿)	36
\eqqsim (⤿)	62
\eqqlslantgtr (⤿)	71
\eqqlslantless (⤿)	71
\eqsim (⤿)	53
\eqsim (⤿)	60
\eqsim (⤿)	58
\eqsim (⤿)	55
\eqsim (⤿)	62
\eqslantgtr (⤿)	68
\eqslantgtr (⤿)	67
\eqslantgtr (⤿)	71
\eqslantgtr (⤿)	70
\eqslantgtr (⤿)	69
\eqslantgtr (⤿)	71
\eqslantless (⤿)	68
\eqslantless (⤿)	67
\eqslantless (⤿)	71
\eqslantless (⤿)	70
\eqslantless (⤿)	69
\eqslantless (⤿)	71
\eqsmile (⤿)	94
\equal (=)	58
\equal (=)	55
\equal (=)	186
\equalclosed (⤿)	55
\equalleftarrow (⤿)	88
\equalparallel (#)	60
\equalparallel (#)	62
\equalrightarrow (⤿)	88
\equalscolon (=:)	64
\equalscoloncolon (=:)	64
\equalsfill	30, 234, 235
equidecomposable	230
equilibrium	see \rightleftharpoons
\equiv (≡)	62
\equiv (≡)	30, 52
\equiv (≡)	57
\equiv (≡)	55
\equiv (≡)	62
\Equivalence (↔)	122
equivalence	see \equiv, \rightarrowleftarrow, and \threesim
\equivclosed (⤿)	55
\equivDD (⤿)	62
\equivVert (#)	62
\equivVvert (#)	62
\eqvparsl (#)	61
\er (⤿)	19
\Eros (⤿)	133
\errbarblackcircle (⤿)	148
\errbarblackdiamond (⤿)	148
\errbarblacksquare (⤿)	148
\errbarcircle (⤿)	148
\errbardiamond (⤿)	148
\errbarsquare (⤿)	148
\errorsym (⤿)	138
es-zet	see \ss
\ESC (⤿)	135
\Esc (Esc)	134
escapable characters	14
\esh (ſ)	20
\esh (ſ)	19
esint (package)	45, 247
esrelation (package)	92, 118, 247
\Estatically (⤿)	136
estimated	see \textestimated
\Estonia (⤿)	194
esvect (package)	115, 247
\Eta (H)	97
\eta (η)	97
\etameson (η)	138
\etamesonprime (η')	138
\etaup (η)	98
\ETB (ȝ)	135
\eth (ð)	124
\eth (ð)	20
\eth (ð)	126
\eth (ð)	19
\ETX (♥)	135
eufrak (package)	128
Euler Roman	98
\Eulerconst (E)	101
\EUR (€)	26
\EURcr (€)	26
\EURdig (€)	26
\EURhv (€)	26
\Euro (€)	26
\euro	27
euro signs	26, 27
blackboard bold	129
\eurologo (€)	27
European countries	194
eurosym (package)	27, 247
\EURtm (€)	26
euscript (package)	128, 247
evaluated at	see \vert
evil spirits	191
\exciton (⤿)	138
\Exclam (!!)	126
exclusive disjunction	see \rightarrowleftarrow \nequiv, and \oplus
exclusive or	229
\exists (Ǝ)	100
\exists (Ǝ)	100
\exists (Ǝ)	101

\exists	100
\exists	101
\exp	96
\experimentalsym	137
\Explosionsafe	136
extarrows (package)	117, 247
extensible accents	112–116, 119, 235–236
extensible arrows	112–118
extensible braces	112–115
extensible symbols, creating	234–236
extensible tildes	112, 115
extension characters	95, 96
\externalsym	137
extpfeil (package)	117, 247
extraipa (package)	23, 247
\eye	162
\eye	152
\EyesDollar	26
F	
F	162
f (esvect package option)	115
\f	21
f	162
\fa	199
\faAdjust	199
\faAdn	199
\faAlignCenter	199
\faAlignJustify	199
\faAlignLeft	199
\faAlignRight	199
\faAmazon	199
\faAmbulance	199
\faAnchor	199
\faAndroid	199
\faAngellist	199
\faAngleDoubleDown	199
\faAngleDoubleLeft	199
\faAngleDoubleRight	199
\faAngleDoubleUp	199
\faAngleDown	199
\faAngleLeft	199
\faAngleRight	199
\faAngleUp	199
\faApple	199
\faArchive	199
\faAreaChart	199
\faArrowCircleDown	140
\faArrowCircleLeft	140
\faArrowCircleODown	140
\faArrowCircleOLeft	140
\faArrowCircleORight	140
\faArrowCircleOUp	140
\faArrowCircleRight	140
\faArrowCircleUp	140
\faArrowDown	140
\faArrowLeft	140
\faArrowRight	140
\faArrows	140
\faArrowsAlt	140
\faArrowsH	140
\faArrowsV	140
\faArrowUp	140
\faAsterisk	199
\faAt	199
\faAutomobile	202
\faBackward	199
\faBalanceScale	199
\faBan	199
\faBank	202
\faBarChart	199
\faBarChart0	202
\faBarcode	199
\faBars	199
\faBattery0	202
\faBattery1	202
\faBattery2	202
\faBattery3	202
\faBattery4	202
\faBatteryEmpty	199
\faBatteryFull	199
\faBatteryHalf	199
\faBatteryQuarter	199
\faBatteryThreeQuarters	199
\faBed	199
\faBeer	199
\faBehance	199
\faBehanceSquare	199
\faBell	199
\faBell0	199
\faBellSlash	199
\faBellSlash0	199
\faBicycle	199
\faBinoculars	199
\faBirthdayCake	199
\faBitbucket	200
\faBitbucketSquare	200
\faBitcoin	26
\faBlackTie	200
\faBold	200
\faBolt	200
\faBomb	200
\faBook	200
\faBookmark	200
\faBookmark0	200
\faBriefcase	200
\faBtc	26
\faBtc	26
\faBug	200
\faBuilding	200
\faBuilding0	200
\faBullhorn	200
\faBullseye	200
\faBus	200
\faBuySellads	200
\faCab	202
\faCalculator	200
\faCalendar	200
\faCalendarCheck0	200
\faCalendarMinus0	200
\faCalendar0	200
\faCalendarPlus0	200
\faCalendarTimes0	200
\faCamera	200
\faCameraRetro	200
\faCar	200
\faCaretDown	200
\faCaretLeft	200
\faCaretRight	200
\faCaretSquareODown	200
\faCaretSquareOLeft	200
\faCaretSquareORight	200
\faCaretSquareOUp	200
\faCaretUp	200
\faCartArrowDown	200
\faCartPlus	200
\faCc	200
\faCcAmex	200
\faCcDinersClub	200
\faCcDiscover	200
\faCcJcb	200
\faCcMastercard	200
\faCcPaypal	200
\faCcStripe	200
\faCcVisa	200
\faCertificate	200
faces	126, 135, 153, 181, 182, 189, 191, 196–202, 206–209
\faChain	202
\faChainBroken	200
\faCheck	144
\faCheckCircle	144
\faCheckCircle0	144
\faCheckSquare	144
\faCheckSquare0	144
\faChevronCircleDown	141
\faChevronCircleLeft	141
\faChevronCircleRight	141
\faChevronCircleUp	141
\faChevronDown	141
\faChevronLeft	141
\faChevronRight	141
\faChevronUp	141
\faChild	200
\faChrome	201
\faCircle	151
\faCircle0	151
\faCircleONotch	151
\faCircleThin	151
\faClipboard	201
\faClock0	201
\faClone	201

\faClose (✖)	144	\faEur (€)	26
\faCloud (☁)	201	\faEuro (€)	26
\faCloudDownload (⬇️)	201	\faExchange (⇄)	202
\faCloudUpload (⬆️)	201	\faExclamation (!)	202
\faCny (¥)	26	\faExclamationCircle (❗)	202
\faCode (</>)	201	\faExclamationTriangle (⚠)	202
\faCodeFork (变异)	201	\faExpand (-expand)	202
\faCodepen (❖)	201	\faExpeditedssl (🔒)	202
\faCoffee (☕)	201	\faExternalLink (↗)	202
\faCog (⚙)	201	\faExternalLinkSquare (🔗)	202
\faCogs (⚙️)	201	\faEye (👁)	202
\faColumns (.ColumnStyle)	201	\faEyedropper (eyedropper)	202
\faComment (💬)	201	\faEyeSlash (⊘)	202
\faCommenting (💬)	201	\faFacebook (𝐟)	202
\faCommenting0 (💬)	201	\faFacebookF (𝐟)	202
\faComment0 (🗨)	201	\faFacebookOfficial (𝐟)	202
\faComments (💬)	201	\faFacebookSquare (𝐟)	202
\faComments0 (🗨)	201	\faFastBackward (⏮)	202
\faCompass (🧭)	201	\faFastForward (⏭)	202
\faCompress (✖)	201	\faFax (📠)	202
\faConnectdevelop (🌐)	201	\faFeed (RSS)	202
\faContao (CMS)	201	\faFemale (👩)	199
\faContent (׀—)	121	\faFighterJet (✈)	199
\faCopy (📄)	202	\faFile (📄)	199
\faCopyright (©)	27	\faFileArchive0 (🗄)	199
\faCreativeCommons (cc)	27	\faFileAudio0 (🔊)	199
\faCreditCard (💳)	201	\faFileCode0 (💻)	199
\faCrop (✂)	201	\faFileExcel0 (xlsx)	199
\faCrosshairs (⊕)	201	\faFileImage0 (🖼)	199
\faCss3 (_CSS)	201	\faFileMovie0 (🎥)	202
\faCube (📦)	201	\faFileO (📄)	199
\faCubes (📦)	201	\faFilePdf0 (PDF)	199
\faCut (✂)	202	\faFilePhoto0 (📸)	202
\faCutlery (🍴)	201	\faFilePicture0 (🖼)	202
\faDashboard (📊)	202	\faFilePowerpoint0 (PPT)	199
\faDashcube (큐)	201	\faFiles0 (📄)	199
\faDatabase (DATABASE)	201	\faFileSound0 (🔊)	202
\faDedent (DEDENT)	202	\faFileText (📄)	199
\faDelicious (DELICIOUS)	201	\faFileText0 (📄)	199
\faDesktop (💻)	201	\faFileVideo0 (🎥)	199
\faDeviantart (DA)	201	\faFileWord0 (WORD)	199
\faDiamond (💎)	201	\faFileZip0 (ZIP)	202
\faDigg (digg)	201	\faFilm (🎥)	199
\faDollar (\$)	26	\faFilter (FILTER)	199
\faDotCircle0 (●)	151	\faFire (🔥)	199
\faDownload (⬇️)	201	\faFireExtinguisher (滅火器)	199
\faDribbble (dribbble)	201	\faFirefox (Firefox)	199
\faDropbox (Dropbox)	201	\faFlag (🚩)	199
\faDrupal (Drupal)	201	\faFlagCheckered (🚩)	199
\faEdit (📝)	202	\faFlag0 (🚩)	199
\faEject (⏏)	201	\faFlash (⚡)	202
\faEllipsisH (⋮)	201	\faFlask (Flask)	199
\faEllipsisV (⋮)	201	\faFlickr (Flickr)	199
\faEmpire (⊗)	201	\faFloppy0 (floppy)	199
\faEnvelope (✉)	201	\faFolder (📁)	199
\faEnvelope0 (✉)	201	\faFolder0 (📁)	199
\faEnvelopeSquare (✉)	201	\faFolderOpen (📁)	199
\faEraser (ลบ)	202	\faFont (A)	199
		\faFonticons (fonticons)	199
		\faForumbee (🐝)	199
		\faForward (▶)	199
		\faFoursquare (F)	199
		\faFrown0 (☹)	199
		\faFutbol0 (⚽)	199
		\faGamepad (🎮)	199
		\faGavel (⚖)	199
		\faGbp (£)	26
		\faGe (🌐)	202
		\faGear (⚙)	202
		\faGears (⚙️)	202
		\faGenderless (O)	136
		\faGetPocket (Pocket)	199
		\faGg (GG)	199
		\faGgCircle (GG)	199
		\faGift (🎁)	199
		\faGit (git)	199
		\faGithub (GH)	199
		\faGithubAlt (GitHub)	199
		\faGithubSquare (GH)	200
		\faGitSquare (git)	200
		\faGittip (Tip)	202
		\faGlass (👓)	200
		\faGlobe (🌐)	200
		\faGoogle (G)	200
		\faGooglePlus (G+)	200
		\faGooglePlusSquare (G)	200
		\faGoogleWallet (Wallet)	200
		\faGraduationCap (graduation cap)	200
		\faGratipay (Gratipay)	200
		\faGroup (group)	202
		\faHackerNews (HN)	200
		\faHandGrab0 (✋)	142
		\faHandLizard0 (🦎)	142
		\faHandODown (👉)	142
		\faHandOLeft (👉)	142
		\faHandORight (👉)	142
		\faHandOUp (👉)	142
		\faHandPaper0 (✋)	142
		\faHandPaper0 (✋)	142
		\faHandPeace0 (✌)	142
		\faHandPointer0 (👉)	142
		\faHandRock0 (✊)	142
		\faHandRock0 (✊)	142
		\faHandScissors0 (✂)	142
		\faHandSpock0 (🖖)	142
		\faHandStop0 (✋)	142
		\faHdd0 (HDD)	200
		\faHeader (H)	200
		\faHeadphones (🎧)	200
		\faHeart (❤)	200
		\faHeartbeat (❤)	200
		\faHeart0 (❤)	200
		\faHistory (History)	200

\faHome (🏡)	200
\faHospital0 (🏥)	200
\faHotel (🏨)	202
\faHourglass (⏳)	200
\faHourglassEnd (⌚)	200
\faHourglassHalf (⌚)	200
\faHourglass0 (⌚)	200
\faHourglassStart (⌚)	200
\faHouzz (🏡)	200
\faHSquare (𝐻)	200
\faHtml5 (🌐)	200
\faICursor (ⓘ)	200
\fafalls (⤙)	26
\fafalls (⤙)	26
\faImage (🖼)	202
\faInbox (✉)	200
\faIndent (☰)	200
\faIndustry (🏭)	200
\faInfo (ⓘ)	200
\faInfoCircle (ⓘ)	200
\faInr (₹)	26
\faInr (₹)	26
\faInstagram (ଓ)	200
\faInstitution (🏛)	202
\faInternetExplorer (🌐)	200
\faIntersex (⚥)	136
\faIoxhost (🌐)	200
\faItalic (.Italic)	200
\faJoomla (Joomla)	200
\faJpy (¥)	26
\faJpy (¥)	26
\faJsfiddle (🔗)	200
\faKey (🔑)	200
\faKeyboard0 (⌨)	200
\faKrw (₩)	26
\faKrw (₩)	26
\faLanguage (🌐)	200
\faLaptop (💻)	200
\faLastfm (ଓ)	200
\faLastfmSquare (ଓ)	200
\faLeaf (leaf)	200
\faLeanpub (📘)	200
\faLegal (⚖)	202
\faLemon0 (🍋)	200
\faLevelDown (⬇)	201
\faLevelUp (⬆)	201
\faLifeBouy (生命的)	202
\faLifeRing (生命的)	201
\faLifeSaver (生命的)	202
\faLightbulb0 (💡)	201
\faLineChart (📈)	201
\faLink (🔗)	201
\faLinkedin (.linkedin)	201
\faLinkedinSquare (linkedin)	201
\faLinux (🐧)	201
\faList (☰)	201
\faListAlt (☷)	201
\faList01 (☰)	201
\faListUl (☰)	201
\fallingdotseq (⤙)	54
\fallingdotseq (⤙)	52
\fallingdotseq (⤙)	60
\fallingdotseq (⤙)	57
\fallingdotseq (⤙)	55
\fallingdotseq (⤙)	61
\FallingEdge (↴)	130
\faLocationArrow (↗)	201
\faLock (🔒)	201
\faLongArrowDown (⬇)	140
\faLongArrowLeft (⬅)	140
\faLongArrowRight (➡)	140
\faLongArrowUp (⬆)	140
falsum	see \bot
\faMagic (🧙)	201
\faMagnet (🧲)	201
\faMailForward (➡)	202
\faMailReply (✉)	202
\faMailReplyAll (✉✉)	202
\faMale (🚹)	201
\faMap (gMaps)	201
\faMapMarker (📍)	201
\faMap0 (gMaps)	201
\faMapPin (📍)	201
\faMapSigns (📍)	201
\faMars (♂)	132, 136
\faMarsDouble (♂♂)	136
\faMarsStroke (♂)	136
\faMarsStrokeH (♂♂)	136
\faMarsStrokeV (♂♂)	136
\faMaxcdn (.maxcdn)	201
\faMeanpath ("path")	201
\faMedium (Ⓜ)	201
\faMedkit (💊)	201
\faMeh0 (☺)	201
\faMercury (☿)	132
\faMicrophone (🎤)	201
\faMicrophoneSlash (🎤)	201
\faMinus (➖)	201
\faMinusCircle (⊖)	201
\faMinusSquare (⊖)	201
\faMinusSquare0 (⊖)	201
\faMobile (📱)	201
\faMobilePhone (📱)	202
\faMoney (💰)	201
\faMoon0 (🌙)	132
\faMortarBoard (🎓)	202
\faMotorcycle (🏍)	201
\faMousePointer (🖱)	201
\faMusic (🎵)	201
\faNavicon (☰)	202
\Fancontent (☰)	121
fancy borders	209–217
\faNeuter (⚲)	136
\faNewspaper0 (📰)	201
\Fanncontent (☰)	121
\Fannquant (☰)	121
\Faquant (☰)	121
\Faquantn (☰)	121
\Faquantnn (☰)	121
\faObjectGroup (⧉)	201
\faObjectUngroup (⧉)	201
\faOdnoklassniki (👤)	201
\faOdnoklassnikiSquare (👤)	201
\faOpenCart (🛒)	201
\faOpenid (👤)	201
\faOpera (ଓ)	201
\faOptinMonster (✉)	201
\faOutdent (☰)	201
\faPagelines (建档立)	202
\faPaintBrush (🖌)	202
\faPaperclip (📎)	202
\faPaperPlane (🛩)	202
\faPaperPlane0 (🛩)	202
\faParagraph (¶)	202
\faPaste (📋)	202
\faPause (⏸)	202
\faPaw (🐾)	202
\faPaypal (🅿)	202
\faPencil (🖍)	141
\faPencilSquare (🖍)	141
\faPencilSquare0 (🖍)	141
\faPhone (📞)	202
\faPhoneSquare (📞)	202
\faPhoto (🖼)	202
\faPicture0 (🖼)	202
\faPieChart (🥧)	202
\faPiedPiper (BSD)	202
\faPiedPiperAlt (BSD)	202
\faPinterest (⤙)	202
\faPinterestP (⤙)	202
\faPinterestSquare (⤙)	202
\faPlane (✈)	199
\faPlay (▶)	199
\faPlayCircle (▶)	199
\faPlayCircle0 (▶)	199
\faPlug (🔌)	199
\faPlus (➕)	199
\faPlusCircle (➕)	199
\faPlusSquare (➕)	199
\faPlusSquare0 (➕)	199
\faPowerOff (📴)	199
\faPrint (🖨)	199
\faPuzzlePiece (🧩)	199
\faQq (👤)	199
\faQrcode (QR)	199
\Faquant (☰)	121
\Faquantn (☰)	121
\Faquantnn (☰)	121
\faQuestion (❓)	199

\faQuestionCircle (⌚)	199
\faQuoteLeft (“)	199
\faQuoteRight (”)	199
\faRa (ଓ)	202
\faRandom (অ)	199
\faRebel (ঔ)	199
\faRecycle (♻)	199
\faReddit (ଓ)	199
\faRedditSquare (ଓ)	199
\faRefresh (⟳)	199
\faRegistered (®)	27
\faRemove (✖)	144
\faRenren (人人)	199
\faReorder (Ξ)	202
\faRepeat (⟳)	140
\faRepeat (⟳)	140
\faReply (↪)	199
\faReplyAll (✉)	199
\faRetweet (🔁)	199
\faRmb (¥)	26
\faRoad (🛣)	199
\faRocket (🚀)	199
\faRotateLeft (↺)	140
\faRotateRight (↻)	140
\faRouble (₽)	26
\faRss (RSS)	199
\faRssSquare (RSS)	199
\faRub (₽)	26
\faRub (₽)	26
\faRuble (₽)	26
\faRupee (₹)	26
\faSafari (🌐)	199
\faSave (💾)	202
\faScissors (✂)	199
\faSearch (🔍)	199
\faSearchMinus (🔍)	199
\faSearchPlus (🔍)	199
\faSellsy (🛒)	199
\faSend (✉)	202
\faSendO (✉)	202
\faServer (💻)	199
\faShare (🔁)	199
\faShareAlt (🔁)	199
\faShareAltSquare (🔄)	199
\faShareSquare (🔄)	199
\faShareSquareO (🔄)	199
\faShekel (₪)	26
\faSheqel (₪)	26
\faShield (🛡)	199
\faShip (🚢)	199
\faShirtsinbulk (👕)	199
\faShoppingCart (🛒)	200
\faSignal (📶)	200
\faSignIn (👤)	200
\faSignOut (👤)	200
\faSimplybuilt (🤖)	200
\faSitemap (sitemap)	200
\faSkyatlas (ଓ)	200
\faSkype (ଓ)	200
\faSlack (slack)	200
\faSliders (🎽)	200
\faSlideshare (slideshare)	200
\faSmile0 (😊)	200
\faSoccerBall10 (⚽)	202
\faSort (👉)	200
\faSortAlphaAsc (🔤)	200
\faSortAlphaDesc (🔤)	200
\faSortAmountAsc (🔢)	200
\faSortAmountDesc (🔢)	200
\faSortAsc (↑)	200
\faSortDesc (↓)	200
\faSortDown (⬇)	202
\faSortNumericAsc (🔢)	200
\faSortNumericDesc (🔢)	200
\faSortUp (↑)	202
\faSoundcloud (☁)	200
\faSpaceShuttle (🚀)	200
\faSpinner (>Loading...	200
\faSpoon (🍴)	200
\faSpotify (.spotify)	200
\faSquare (▣)	151
\faSquareO (▢)	151
\faStackExchange (.StackExchange)	200
\faStackOverflow (.StackOverflow)	200
\faStar (⭐)	146
\faStarHalf (HALF ⭐)	146
\faStarHalfEmpty (HALF ⭐)	146
\faStarHalfFull (HALF ⭐)	146
\faStarHalfO (HALF ⭐)	146
\faStarHalfO (HALF ⭐)	146
\faStar0 (⭐)	146
\faSteam (🎮)	200
\faSteamSquare (🎮)	200
\faStepBackward (⬅)	200
\faStepForward (➡)	200
\faStethoscope (ঔ)	200
\faStickyNote (📝)	200
\faStickyNoteO (📝)	200
\faStop (⏹)	200
\faStreetView (📍)	200
\faStrikethrough (刪除)	200
\faStumbleupon (tumblr)	200
\faStumbleuponCircle (tumblr)	200
\faSubscript (x₂)	200
\faSubway (🚇)	200
\faSuitcase (กระเป๋า)	200
\faSun0 (☀)	132
\faSuperscript (x²)	200
\faSupport (\Support)	202
\faTable (💻)	200
\faTablet (📱)	200
\faTachometer (🏎)	200
\faTag (>tag)	200
\faTags (🏷)	200
\faTasks (📝)	201
\faTaxi (🚕)	201
\faTblash (TB)	32
\faTblash (TB)	60
\faTelevision (📺)	201
\faTencentWeibo (WB)	201
\faTerminal (terminal)	201
\faTextHeight (T!)	201
\faTextWidth (T)	201
\faTh (grid)	201
\faThLarge (grid)	201
\faThList (grid)	201
\faThumbsDown (👎)	142
\faThumbsODown (👎)	142
\faThumbsOUp (👍)	142
\faThumbsUp (👍)	142
\faThumbTack (📌)	201
\faTicket (🎫)	201
\faTimes (✖)	144
\faTimes (✖)	144
\faTimesCircle (✖)	144
\faTimesCircleO (✖)	144
\faTint (💧)	201
\faToggleDown (▢)	202
\faToggleLeft (▢)	202
\faToggleOff (▢)	201
\faToggleOn (▢)	201
\faToggleRight (▢)	202
\faToggleUp (▢)	202
\faTrademark (TM)	27
\faTrain (🚂)	201
\faTransgender (⚧)	136
\faTransgender (⚧)	136
\faTransgenderAlt (⚧)	136
\faTrash (🗑)	201
\faTrashO (🗑)	201
\faTree (🌳)	201
\faTrello (rello)	201
\faTripadvisor (TripAdvisor)	201
\faTrophy (🏆)	201
\faTruck (🚚)	201
\faTry (TRY)	26
\faTry (TRY)	26
\fatsemi (⋮)	32
\fatsemi (⋮)	35
\fatslash (//)	32
\fatslash (//)	60
\faTty (tty)	201
\faTumblr (t)	201
\faTumblrSquare (t)	201
\faTurkishLira (₺)	26
\faTv (tv)	202
\faTwitch (.twitch)	201
\faTwitter (🐦)	201
\faTwitterSquare (🐦)	201
\faUmbrella (☂)	201
\faUnderline (U)	201
\faUndo (.undo)	140
\faUndo (undo)	140
\faUniversity (university)	201

\faUnlink (☒)	202	\fcscore ()	185
\faUnlock (🔓)	201	.fd files	12, 238, 245
\faUnlockAlt (🔓)	201	\fdiagovnearrow (↗)	88
\faUnsorted (⤵)	202	\fdiagovrdiag (↖)	126
\faUpload (📤)	201	fdsymbol (package)	34, 35, 38,
\faUsd (\$)	26	39, 47, 48, 57–59, 66, 70, 74, 81–85, 94, 95, 99, 101, 106, 107, 111, 113, 120, 123, 125, 147, 151, 163, 247	
\faUser (👤)	201	feet	see \prime and \textquotesingle
\faUserMd (👤)	201	\FEMALE (♀)	136
\faUserPlus (👤+)	201	\Female (♀)	136
\faUsers (👥)	201	female	18, 131–133, 136, 197–202, 206–209
\faUserSecret (🔐)	201	\female (♀)	136
\faUserTimes (✖)	201	\FemaleFemale (♀)	136
\faVenus (♀)	132, 136	\FemaleMale (♂)	136
\faVenusDouble (⚥)	136	\Ferli (ⓘ)	165
\faVenusMars (⚥)	136	\fermata	170
\faViacoin (₩)	26	\fermata (ⓘ)	168
\faVideoCamera (🎥)	201	\fermatadown (ⓘ)	164
\faVimeo (Vimeo)	201	\fermataup (ⓘ)	164
\faVimeoSquare (Vimeo)	201	\Fermi (ⓘ)	165
\faVine (Vine)	201	\fermiDistrib (⚡)	137
\faVk (VK)	201	\fermion (⚡)	137
\faVolumeDown (🔉)	201	fermions	137–138
\faVolumeOff (🔇)	201	feyn (package)	137, 247, 248
\faVolumeUp (🔊)	201	Feynman slashed character nota-	
\faWarning (⚠)	202	tion	231
\faWechat (wechat)	202	Feynman-diagram symbols	137
\faWeibo (weibo)	202	\feyn{a} (ⓘ)	137
\faWeixin (weixin)	202	\feyn{c} (ⓘ)	137
\faWhatsapp (WhatsApp)	202	\feyn{fd} (ⓘ)	137
\faWheelchair (♿)	202	\feyn{f1S} (ⓘ)	137
\faWifi (WiFi)	202	\feyn{fly} (ⓘ)	137
\faWikipediaW (Wikipedia)	202	\feyn{fs} (ⓘ)	137
\faWindows (Windows)	202	\feyn{fu} (ⓘ)	137
\faWon (₩)	26	\feyn{fv} (ⓘ)	137
\faWordpress (WordPress)	202	\feyn{f} (ⓘ)	137
\faWrench (🔐)	202	\feyn{g1} (ⓘ)	137
\fAX (FAX)	136	\feyn{gd} (ⓘ)	137
\fax (fax)	136	\feyn{glB} (ⓘ)	137
\faXing (X)	202	\feyn{glS} (ⓘ)	137
\faXingSquare (X)	202	\feyn{glu} (ⓘ)	137
\Faxmachine (📞)	136	\feyn{gl} (ⓘ)	137
\faYahoo (Y)	202	\feyn{gu} (ⓘ)	137
\faYc (Y)	202	\feyn{gvs} (ⓘ)	137
\faYCombinator (Y)	202	\feyn{gv} (ⓘ)	137
\faYCombinatorSquare (Y)	202	\feyn{g} (ⓘ)	137
\faYcSquare (Y)	202	\feyn{hd} (ⓘ)	137
\faYelp (Yelp)	202	\feyn{hs} (ⓘ)	137
\faYen (¥)	26	\feyn{hu} (ⓘ)	137
\faYoutube (YouTube)	202	\feyn{h} (ⓘ)	137
\faYoutubePlay (YouTube)	202	\feyn{ms} (ⓘ)	137
\faYoutubeSquare (YouTube)	202		
\fbbowtie (▣)	61		
fc (package)	16, 21		
\fcdice (▣▣▣▣▣▣)	184		
fclfont (package)	247		
\fcmp (;)	36		
\Fcontent (——)	121		
		\feyn{m} (=)	137
		\feyn{P} (●)	137
		\feyn{p} (○)	137
		\feyn{x} (⚡)	137
		\FF (♀)	135
		fge (package)	91, 102, 111, 122, 126, 247, 248
		\fgeA (V)	102
		\fgebackslash (\)	126
		\fgebaracute (ⓘ)	126
		\fgebarcap (ⓘ)	126
		\fgec (⚢)	102
		\fgecap (ⓘ)	126
		\fgecapbar (ⓘ)	126
		\fgecup (ⓘ)	126
		\fgecupacute (ⓘ)	126
		\fgecupbar (ⓘ)	126
		\fged (⚢)	102
		\fgee (⚢)	102
		\fgeeszett (g)	102
		\fgeeta (⚢)	102
		\fgeF (⚢)	102
		\fgef (⚢)	102
		\fgeinfinity (ⓘ)	126
		\fgelangle (ⓘ)	126
		\fgelb	102
		\fgelb (⚢)	102
		\fgeleftB (⚢)	102
		\fgeleftC (ⓘ)	102
		\fgeN (⚢)	102
		\fgeoverU (⚢)	102
		\fgerightarrow (→)	91
		\fgerightB (⚢)	102
		\fges (f)	102
		\fgestruckone (ⓘ)	122
		\fgestruckzero (ⓘ)	122
		\fgeU (⚢)	102
		\fgeuparrow (↑)	91
		\fgeupbracket (ⓘ)	126
		field (F) . see alphabets, math	
		\file (⇔)	186
		file extensions	
		.dvi	244
		.fd	12, 238, 245
		.mf	12, 204, 236
		.otf	163
		.pdf	244
		.sty	12
		.tex	244, 245
		.tfm	12, 204, 226, 245
		file symbols	199–202
		\FilledBigCircle (●)	149
		\FilledBigDiamondshape (◆)	150
		\FilledBigSquare (■)	150
		\FilledBigTriangleDown (▼)	150

\FilledBigTriangleLeft (◀)	150
\FilledBigTriangleRight (▶)	149
\FilledBigTriangleUp (▲)	149
\FilledCircle (●)	149
\FilledCloud (☁)	183
\filleddiamond (◆)	38
\FilledDiamondShadowA (◆)	149
\FilledDiamondShadowC (◆)	149
\FilledDiamondshape (◆)	149
\FilledHut (▲)	183
\filledlargestar (★)	147
\filledlozenge (◆)	147
\filledmedlozenge (◆)	147
\filledmedsquare (■)	38
\filledmedtriangledown (▼)	38, 73
\filledmedtriangleleft (◀)	38, 73
\filledmedtriangleright (▶)	38, 73
\filledmedtriangleup (▲)	38, 73
\FilledRainCloud (霏)	183
\FilledSectioningDiamond (❖)	183
\FilledSmallCircle (●)	149
\FilledSmallCircle (●)	150
\FilledSmallDiamondshape (◆)	149
\FilledSmallSquare (■)	149
\FilledSmallTriangleDown (▼)	149
\FilledSmallTriangleLeft (◀)	149
\FilledSmallTriangleRight (▶)	149
\FilledSmallTriangleUp (▲)	149
\FilledSnowCloud (霏)	183
\FilledSquare (■)	149
\filledsquare (■)	38
\FilledSquareShadowA (■)	149
\FilledSquareShadowC (■)	149
\filledsquarewithdots (❖)	152
\filledstar (★)	38
\FilledSunCloud (霏)	183
\FilledTriangleDown (▼)	149
\filledtriangledown (▼)	38, 73
\FilledTriangleLeft (◀)	149
\filledtriangleleft (◀)	38, 73
\FilledTriangleRight (▶)	149
\filledtriangleright (▶)	38, 73
\FilledTriangleUp (▲)	150
\filledtriangleup (▲)	38, 73
\FilledWeakRainCloud (霏)	183
finger, pointing	see fists
finite field (\mathbb{F})	see alphabets, math
\Finland (▶)	194
\finpartvoice (▀)	23
\finpartvoiceless (▀)	23
\fint (ƒ)	44
\fint (ƒ)	45
\fint (ƒ)	47
\fint (ƒ)	48
\fintsL (ƒ)	50
\fintup (ƒ)	50
\Finv (ɔ)	100
\Finv (ɔ)	100
\Finv (ɔ)	101
\Finv (ɔ)	101
\Finv (ɔ)	101
\Fire (🔥)	183, 197
\Fire (Δ)	133
fish	210–211
fish hook	see \strictif
\fisheye (◎)	148
fists	142, 204
\fivedots (⋮)	33, 120
\FiveFlowerOpen (❖)	145
\FiveFlowerPetal (❖)	145
\FiveStar (★)	145
\FiveStarCenterOpen (☆)	145
\FiveStarConvex (★)	145
\FiveStarLines (☆)	145
\FiveStarOpen (☆)	145
\FiveStarOpenCircled (★)	145
\FiveStarOpenDotted (★)	145
\FiveStarOutline (★)	145
\FiveStarOutlineHeavy (★)	145
\FiveStarShadow (☆)	145
\Fixedbearing (❖)	136
\fixedddots (⋮)	119
\fixedvdots (⋮)	119
fixmath (package)	241
\fj (fj)	20
\FVL (l)	134
\Flag (⚑)	183
\flageolett (⚐)	164
flags	197–198
\flap (f)	20
\flap (r)	19
\Flasche (◊)	196
\flat (b)	163
\flat (b)	163
\flat (b)	163
\flat (b)	167
\flat (b)	163
\flat (b)	163
\flatflat (bb)	167
\Flatsteel (—)	136
fletched arrows	91, 139
fleurons	146, 152, 209–210
\Florin (φ)	26
florin	see \textflorin
flourishes	152, 213
\floweroneleft (❶)	146
\floweroneright (❷)	146
flowers	145, 146, 197–198, 209–211
\fltns (□)	148
Flynn, Peter	230
\FM (☒)	134
\Fncontent (——)	121
\Fncontent (——)	121
\Fnquant (⊠)	121
\Fnquant (⊠)	121
\Fnquantn (⊠)	121
\Fnquantn (⊠)	121
\Fnquant (⊠)	121
\Fnquant (⊠)	121
\Fnquantn (⊠)	121
\fnsymbol	185
\Fog (霏)	183
font encodings	12, 14–17, 20, 21, 24, 229, 234, 241, 242, 244, 246
7-bit	12
8-bit	12
ASCII	246
Cyrillic	21
document	242, 244
Latin 1	246
limiting scope of	12
LY1	12
OT1	12, 15, 21, 234, 241, 242
OT2	229
T1	12, 14, 15, 17, 21, 242, 244
T2A	21, 229
T2B	21
T2C	21
T4	16, 20, 21, 24
T5	16, 21
TS1	229, 242
U	229
X2	21

\fontawesome (package)	26, 27, 132, 136, 140–142, 144, 146, 151, 199, 202, 247, 248
\fontdef.dtx (file)	230, 234
\fontenc (package)	12, 15, 17, 21, 242, 244
\fontencoding	12
fonts	
Calligra	128
Charter	26, 51
Computer Modern	92, 226, 228, 242
CountriesOfEurope	195
Courier	26
Emmentaler	168
Garamond	26, 51
Helvetica	26
“pi”	229
Soyombo	193
Symbol	98, 229
Times Roman	26, 228
Type 1	239
Utopia	26, 51
Zapf Chancery	128
Zapf Dingbats	139, 144
\fontsize	226, 228
\fontspec (package)	163, 245, 246
\Football (❖)	182
\forall (forall)	100
\forallall (forall)	101
\forallall (forall)	100
\forallall (forall)	101
\Force (Force)	136
\Fork (fork)	196
\forks (forks)	62
\forksnot (forksnot)	61
\forkv (forkv)	60
\forkv (forkv)	61
forte (forte)	168, 179
\Fortune (fortune)	133
\Forward (forward)	182
\ForwardToEnd (forward to end)	182
\ForwardToIndex (forward to index)	182
\FourAsterisk (four asterisk)	145
\FourCloverOpen (four clover open)	145
\FourCloverSolid (four clover solid)	145
\Fourier (fourier)	64
fourier (package)	27, 64, 98, 102, 109, 115, 142, 146, 182, 247
fourier (emf package option)	131
\fourier (fourier)	64
Fourier transform (Fourier transform)	see alphabets, math
\FourStar (four star)	145
\FourStarOpen (four star open)	145
\fourth (fourth)	124
\fourvdots (four vdots)	120
\Fquantn (Fquantn)	121
\Fquantnn (Fquantnn)	121
\fracslash (fracslash)	36
fractions	126
fraktur	see alphabets, math
\France (France)	194
\fcursive (fcursive)	131
Freemason’s cipher	191
\frege (frege)	121, 247, 248
Frege logic symbols	91, 102, 121, 122, 126
Frege, Gottlob	121
\frown (frown)	52
\frown (frown)	60
\frown (frown)	57, 95
\frown (frown)	94
\frown (frown)	61
frown symbols	94, 95
\frowneq (frowneq)	57, 95
\frowneq (frowneq)	94
\frowneqsmile (frowneqsmile)	94
\frownie (frownie)	181
\frownsmile (frownsmile)	57, 95
\frownsmile (frownsmile)	94
\frownsmileeq (frownsmileeq)	94
\Frowny (frowny)	182
frowny faces	135, 181, 182, 196–202
\fryingpan (fryingpan)	196
\FS (FS)	135
\fullmoon (fullmoon)	132
\fullmoon (fullmoon)	131
\fullnote (fullnote)	163
\fullouterjoin (fullouterjoin)	126
G	
\G (G)	21
g (esvect package option)	115
g (X)	162
\Game (Game)	100
\Game (Game)	100
\Game (Game)	101
\Game (Game)	101
\Game (Game)	101
game-related symbols	151, 183, 184, 186–188, 199–202, 223–226
\Gamma (Gamma)	97
\gamma (gamma)	97
\gammamaup (gammaup)	98
\Ganz (ganz)	165
\GaPa (gapa)	165
Garamond (font)	26, 51
\Gasstove (gasstove)	196
\gcd (gcd)	96
\GD (GD)	134
\GE (GE)	134
\ge (ge)	see \geq
\ge (ge)	70
\ge (ge)	72
\Gemini (Gemini)	132
\Gemini (Gemini)	132
\Gemini (Gemini)	133
\gemini (gemini)	131
genealogical symbols	181
\geneuro (euro)	27
\geneuronarrow (euroarrow)	27
\geneurowide (eurowide)	27
\gensymb (gensymb)	130
\Gentsroom (gent)	182
geometric shapes	133, 146–151, 173–178, 187, 188, 199–202, 204–206, 222
\geq (geq)	68
\geq (geq)	67, 68
\geq (geq)	70
\geq (geq)	69
\geq (geq)	71, 72
\geqclosed (geqclosed)	70, 74
\geqclosed (geqclosed)	69, 73
\geqdot (geqdot)	70
\geqdot (geqdot)	69
\geqq (geqq)	68
\geqq (geqq)	67
\geqq (geqq)	71
\geqq (geqq)	70
\geqq (geqq)	69
\geqq (geqq)	71
\geqslant (geqslant)	72
\geqslant (geqslant)	67
\geqslant (geqslant)	67
\geqslant (geqslant)	71
\geqslant (geqslant)	70
\geqslant (geqslant)	69
\geqslant (geqslant)	72
\geqslantdot (geqslantdot)	70
\geqslantdot (geqslantdot)	69
\geqslcc (geqslcc)	70
german (keystroke package option)	134
Germanic runes	162
\Germany (Germany)	195
\gescc (gescc)	70
\gescc (gescc)	72
\gesdot (gesdot)	70
\gesdot (gesdot)	72
\gesdot (gesdot)	72
\gesdotol (gesdotol)	72
\gesl (gesl)	70
\gesles (gesles)	72
\gets (gets)	see \leftarrow
\gets (gets)	83
\gg (gg)	68
\gg (gg)	67
\gg (gg)	70
\gg (gg)	69
\gg (gg)	72
\ggcurly (ggcurly)	54

H	
\H (N)	162
\H (”)	21
h (esvect package option)	115
\h (H)	162
\h (”)	21
h (H)	162
Hälsinge runes	<i>see</i> staveless runes
\HA (—)	154
\Ha (A)	154
háček (ˇ)	<i>see</i> accents
\Hades (ƒ)	133
\Hail (ɔɔ)	183
\Halb (ɔ)	165
half note	<i>see</i> musical symbols
\HalfCircleLeft (◐)	150
\HalfCircleRight (◑)	150
\HalfFilledHut (◓)	183
\halflength (‘)	25
\halfNote (J)	166
\halfnote (J)	163
\halfNoteDotted (J.)	166
\halfNoteDottedDouble (J.)	166
\halfNoteDottedDoubleDown (P..)	166
\halfNoteDottedDown (P..)	166
\halfNoteDown (P)	166
\halfNoteRest (—)	168
\halfNoteRestDotted (—.)	168
\HalfSun (⌚)	183
haloweenmath (package)	40, 118, 247, 248
Hamiltonian (H)	<i>see</i> alphabets, math
\HandCuffLeft (◐)	142
\HandCuffLeftUp (◑)	142
\HandCuffRight (◐)	142
\HandCuffRightUp (◑)	142
\HandLeft (☶)	142
\HandLeftUp (☷)	142
\HandPencilLeft (☲)	142
\HandRight (☱)	142
\HandRightUp (☱)	142
hands	<i>see</i> fists
hands (package)	204, 247
\Handwash (盥)	182
\HaPa (▬)	165
harmony (package)	165, 247
harpoon (package)	91, 247, 248
harpoons	75–77, 80, 81, 85, 87, 90–92, 222
\hash (#)	124
\hash (#)	60
hash mark	<i>see</i> \#
\hat (▀)	111
\hat (▀)	110
\hatapprox (≈)	61
\hateq (≡)	58
\hateq (≈)	55
\hausaB (Ɓ)	20
\hausab (Ɓ)	20
\hausaD (Ɗ)	20
\hausad (Ɗ)	20
\hausaK (Ƙ)	20
\hausak (ƙ)	20
\HB (߂)	154
\Hb (߂)	154
\HBar (—)	150
\hbar (ℏ)	100, 230
\hbar (ℏ)	101
\hbar (ℏ)	101
\hbar (ℏ)	101
\hbipropto (∞)	33
\hbond (#+#+)	137
\HC (߂)	154
\Hc (߁)	154
\hcrossing (×)	55
\HCthousand (߂)	154
\HD (߂)	154
\Hd (߂)	154
\hddotdot (..)	34, 120
\hddotdot (..)	33, 120
\hdots (…)	120
\hdots (…)	120
\Hdual (߂)	154
\HE (߂)	154
\He (߂)	154
heads	<i>see</i> faces
\Heart (♥)	182
heartctrbull (bulcntr package option)	185
\heartctrbull	185
hearts	133, 151, 152, 197–202
\heartsuit (♥)	151
\heavyqleft (‘‘)	196
\heavyqright (‘‘)	196
Hebrew	99, 100, 129
Helvetica (font)	26
\hemiohelion (c)	27
\Herd (☒)	196
\HERMAPHRODITE (⚥)	136
\Hermaphrodite (♀)	136
\Hermaphrodite (♂)	136
\hermitmatrix (+)	125
\hermitmatrix (+)	126
\Heta (Ϝ)	159
\heta (ϝ)	159
\hexagon (○)	148
\hexagonblack (●)	148
\Hexasteel (●)	136
\hexstar (★)	144
\HF (≈)	130
\HF (϶)	154
\Hf (϶)	154
\hfermion (_)	137
\hfil	231
\HG (߂)	154
\Hg (߂)	154
\HH	165
\HH (߁)	154
\Hh (߂)	154
hhcount (package)	184, 185, 247, 248
\Hhundred (߂)	154
\HI (߂)	154
\Hi (߁)	154
\hiatus (߁)	189
\Hibl (߂)	154
\Hibp (߂)	154
\Hibs (߂)	154
\Hibw (߁)	154
\Hidalgo (߁)	133
hieroglfl (package)	154, 247
hieroglyphics	154
\Higgsboson (߁)	137
Hilbert space (H)	<i>see</i> alphabets, math
\hill (߂)	23
\HJ (߁)	154
\Hj (߂)	154
\HK (ߡ)	154
\Hk (߁)	154
\hknearrow (↗)	83
\hknearrow (↖)	88
\hknarrow (↑)	83
\hknarrow (↓)	88
\hksearrow (↖)	88
\hksearrow (↙)	83
\hksqrt (sqrt)	233
\hkswarrow (↗)	88
\hkswarrow (↖)	83
\HL (ߡ)	154
\Hl (߁)	154
\HM (▬)	154
\Hm (߁)	154
\Hman (߁)	154
\Hmillion (߁)	154
\Hms (߁)	154
\HN (▬)	154
\Hn (▬)	154
\HO (߁)	154

\IJ (IJ)	15	\int (\int)	42	\invamp (\mathfrak{I})	32
\ij (ij)	15	\int (\int)	48	\invamp (\mathfrak{I})	37
\Im (\Im)	100	\int (\int)	46	\invbackneg (\neg)	125
\Im (\Im)	101	\int (\int)	49		135
\im (j)	101	\intBar (\int)	48	\invdiameter (\mathfrak{Q})	181
\imageof ($\rightarrow\!\!\!\rightarrow$)	94	\intBar (\int)	49	\inve (\mathfrak{e})	20
\imageof ($\rightarrow\!\!\!\rightarrow$)	61	\intbar (\int)	48	inverse limit . <i>see</i> \varprojlim	
\imath (\imath)	100, 110	\intbar (\int)	49	\inversebullet (\blacksquare)	126
\imath (\imath)	101	\intBarsl (\int)	50	\inversewhitecircle (\blacksquare)	148
\imath (\imath)	101	\intbarsl (\int)	50	\InversTransformHoriz ($\bullet\!\!\!\circ$)	64
\impliedby <i>see</i> \Longleftarrow		\intBarup (\int)	50	\InversTransformVert (\bullet)	64
\implies <i>see</i> \Longrightarrow and \vdash		\intbarup (\int)	50	inverted symbols 17–20, 24, 229–230	
impulse train <i>see</i> sha		\intcap (\int)	49	inverters	135
\in (\in)	100	\intcapsl (\int)	51	\invf (j)	19
\in (\in)	100	\intcapup (\int)	51	\invglotstop (b)	19
\in (\in)	57, 101	\intclockwise (\int)	48	\invh (\mathfrak{q})	19
\in (\in)	101	\intclockwise (\int)	51		135
\in (\in)	100	\intclockwise (\int)	49	\invlazys (\sim)	36
\in (\in)	61	\intclockwisesl (\int)	50	\invlegr (l)	19
inches <i>see</i> \second and \textquotedbl		\intclockwiseup (\int)	50	\invm (m)	19
\incoh (\asymp)	64	\intctrcclockwise (\int)	48	\invneg (\neg)	53
\increment (Δ)	126	\intcup (\int)	49	\invneg (\neg)	125
independence		\intcups1 (\int)	51	\invneg (\neg)	125
probabilistic	232	\intcupup (\int)	51	\invneg (\neg)	125
statistical	232	\INTEGER (Z)	96	\invnot (\neg)	125
stochastic <i>see</i> \bot		\Integer (Z)	96	\invnot (\neg)	125
\independent ($\perp\!\!\!\perp$)	233	integers (Z) <i>see</i> alphabets, math		\invnot (\neg)	125
\Industry (\mathfrak{m})	182	integrals 41–52, 125, 232 product	52	\invnot (\neg)	126
inequalities	14, 67–72	integrals (wasysym package op- tion)	43		135
inexact differential <i>see</i> \dbar		\interaction (\bowtie)	137	\invr (i)	19
\inf (inf)	96	\intercal (\top)	31	\invscr (s)	19
infimum <i>see</i> \inf and \sqcap		\intercal (\top)	35, 101	\invscripta (v)	19
infinity	122, 124–126, 232	\intercal (\top)	34	\invsmileface (\mathfrak{S})	196
\Info (I)	182	\intercal (\top)	100		135
\Info (I)	192	\intercal (\top)	36, 101	\invv (Λ)	19
information symbols	182	interior <i>see</i> \mathring		\invw (\mathbb{M})	19
informator symbols	186	\interleave ()	32	\invwhitelowerhalfcircle (\blacksquare)	
\infty (∞)	124	\interleave ()	36	\invwhiteupperhalfcircle (\blacksquare)	
\infty (∞)	124	\internalsym (\blacksquare)	137	\invy (\mathfrak{x})	19
\infty (∞)	125	intersection <i>see</i> \cap		\IO (\mathfrak{z})	134
\infty (∞)	125	\Interval (\mathfrak{C})	183	\ion (\mathfrak{O})	137
\infty (∞)	122	\intlarhk (\int)	49	\ionicbond (\oplus)	137
\ING (ϕ)	162	\intlarhksl (\int)	51	\Iota (I)	97
\Ing (\mathfrak{T})	162	\intlarhkup (\int)	51	\iotaota (ι)	97
\ing (\mathfrak{T})	162	\intprod (\neg)	34, 35, 125	iota, upside-down	229
\inipartvoice (■)	23	\intprod (\neg)	36	\iotaup (\mathfrak{t})	98
\inipartvoiceless (■)	23	\intprodr (\leftarrow)	34, 35, 125	\ipagamma (y)	19
\injlim (inj lim)	96	\intprodr (\leftarrow)	36	\iperatal ($^+$)	189
\Innocey (\mathfrak{G})	196	\intsl (\int)	50	\Ireland (,	195
\inplus (\mathfrak{E})	53	\intup (\int)	48	\IroningI (\mathfrak{a})	182
\inplus (\mathfrak{E})	60	\intup (\int)	50	\IroningII (\mathfrak{a})	182
inputenc (package)	245	\intx (\int)	49	\IroningIII (\mathfrak{a})	182
\Ins (■)	134	\intxsl (\int)	51	irony mark (\mathfrak{f})	229
\int (\int)	44	\intxup (\int)	51		
\int (\int)	43	\inva (v)	19		
\int (\int)	43				

irrational numbers (\mathbb{J})	see alphabets, math
$\backslash Irritant (\mathbf{X})$	183
$\backslash isindot (\dot{\epsilon})$	61
$\backslash isinE (\Subset)$	61
$\backslash isinobar (\bar{\epsilon})$	61
$\backslash isins (\mathfrak{s})$	61
$\backslash isinvb (\Subset)$	61
$\backslash ismodeledby (=)$	230
ISO character entities	244
isoent (package)	244
Isthmian script	160–161
italic	14, 15, 27, 236, 238–240, 242
$\backslash Italy (\mathfrak{S})$	195
J	
$\text{J} (\mathfrak{h})$	162
$\backslash j (\diamond)$	162
$\backslash j (j)$	21
$j (\diamond)$	162
$\backslash JackStar (\ddot{\star})$	145
$\backslash JackStarBold (\ddot{\star}\ddot{\star})$	145
Jewish star	144, 145
$\backslash jmath (j)$	100, 110
$\backslash jmath (j)$	101
$\backslash jmath (j)$	101
$\backslash Joch (\mathfrak{l})$	183
$\backslash Join (\bowtie)$	52, 53
$\backslash Join (\bowtie)$	35, 58
$\backslash Join (\bowtie)$	34
$\backslash Join (\bowtie)$	126
$\backslash joinrel$	230
joint denial	see $\backslash downarrow$
$\backslash Jpsimeson (\mathfrak{y})$	137
junicode (package)	245, 247
Junicode.ttf (file)	245
$\backslash Juno (\mathfrak{x})$	133
$\backslash Jupiter (\mathfrak{y})$	132
$\backslash Jupiter (\mathfrak{z})$	132
$\backslash Jupiter (\mathfrak{z})$	133
$\backslash jupiter (\mathfrak{z})$	131
K	
$\backslash K (\mathfrak{y})$	162
$\backslash k (\cup)$	162
$\backslash k (\mathbb{K})$	24
$\backslash k (\mathbb{K})$	21
$k (<)$	162
$\backslash Kaonminus (K^-)$	137
$\backslash Kaonnull (K^0)$	138
$\backslash Kaonplus (K^+)$	138
$\backslash Kappa (K)$	97
$\backslash kappa (\kappa)$	97
$\backslash kappaup (\kappa)$	98
$\backslash ker (ker)$	96
$\backslash kernelcontraction (\approx)$	60
$\backslash kernelcontraction (\approx)$	61
ket	103
$\backslash Keyboard (\mathbb{M})$	134
keyboard symbols	134
keys, computer	134
keystroke (package)	134, 247
$\backslash keystroke (\mathbb{Q})$	134
king	187, 224–226
$\backslash Knife (\mathfrak{l})$	196
knight	187, 224–226
knitting (package)	193, 247, 248
knitting symbols	193
knot (package)	213, 217, 247
knots	213–217
Knuth, Donald E.	12, 92, 242, 249
symbols by	181
$\backslash Kochtopf (\mathbb{K})$	196
$\backslash Koppa (\mathfrak{Y})$	159
$\backslash koppa (\mathfrak{t})$	159
$\backslash Kr (\mathbb{O})$	165
$\backslash kreuz (\star)$	181
Kronecker product	see $\backslash otimes$
Kronecker sum	see $\backslash oplus$
$\backslash Kronos (\mathfrak{P})$	133
kroužek ($\hat{\circ}$)	see accents
$\backslash kside (\gg)$	186
L	
$\backslash L (L)$	15
$\backslash l (\mathfrak{l})$	15
$l (\mathfrak{l})$	162
$\backslash labdentalnas (\mathfrak{nj})$	19
$\backslash labvel$	23
$\backslash Ladiesroom (\mathfrak{t})$	182
Lagrangian (\mathcal{L})	see alphabets, math
$\backslash Lambda (\Lambda)$	97
$\backslash lambda (\lambda)$	97
$\backslash lambdabar (\lambda)$	124
$\backslash lambdabar (\lambda)$	125
$\backslash lambdaslash (\lambda)$	124
$\backslash lambdaslash (\lambda)$	125
$\backslash lambdaup (\lambda)$	98
Lamport, Leslie	246, 249
$\backslash land$	see $\backslash wedge$
$\backslash land (\wedge)$	35
$\backslash land (\wedge)$	36
land masses	194
$\backslash landdownint (\oint)$	45
$\backslash landdownint (\oint)$	48
$\backslash landdownint (\oint)$	46
$\backslash landupint (\oint)$	45
$\backslash landupint (\oint)$	47, 48
$\backslash landupint (\oint)$	46
$\backslash Langle (\ll)$	129
$\backslash lAngle (\langle\!\langle)$	109
$\backslash lAngle (\mathbb{K})$	106
$\backslash langle (\langle\!\langle)$	107
$\backslash langle (\langle)$	30, 103
$\backslash langle (\langle)$	106
$\backslash langle (\rangle)$	105
$\backslash langle (\rangle)$	108
$\backslash langlebar (\langle\!\langle)$	105
$\backslash langledot (\langle\!\langle)$	106
$\backslash langledot (\langle)$	103
$\backslash laplac (\square)$	126
$\backslash Laplace (\bullet\longrightarrow)$	64
$\backslash laplace (\circ\longrightarrow)$	64
Laplace transform (\mathcal{L})	see alphabets, math
Laplacian (Δ)	see $\backslash Delta$
Laplacian (∇^2)	see $\backslash nabla$
$\backslash largeblackcircle (\bullet)$	147
$\backslash largeblacksquare (\blacksquare)$	147
$\backslash largeblackstar (\star)$	147
$\backslash largecircle (\circ)$	147
$\backslash largecircle (\bigcirc)$	147
largectrbull (bullcntr package option)	185
$\backslash largectrbull$	185
$\backslash largediamond (\diamondsuit)$	147
$\backslash largeLozenge (\diamondsuit)$	147
	141
$\backslash largepentagram (\star)$	147
$\backslash LargerOrEqual (\geq)$	122
$\backslash large square (\square)$	147
$\backslash large square (\square)$	147
$\backslash largestar (\star)$	147
$\backslash largestarofdavid (\triangle)$	147
$\backslash largestriangledown (\nabla)$	74, 147
$\backslash largestriangledown (\nabla)$	73
$\backslash largestriangleleft (\triangleleft)$	73
$\backslash largestriangleright (\triangleright)$	73
$\backslash largestriangleup (\triangle)$	74, 147
$\backslash largestriangleup (\triangle)$	73
$\backslash largewhitestars (\star)$	147
$\backslash LArrow (\mathbb{L})$	134
$\backslash larrowfill$	117
$\backslash Laserbeam (\ast)$	136
$\backslash lat (\rightarrow)$	71
$\backslash late (\geq)$	71
LaTeX	1, 12, 21, 52, 96, 103, 119, 124, 139, 185,

\leftharpoonsupdown ($\Leftarrow\Rightarrow$)	90	\leftrightarrowtriangle (\leftrightarrow)	89
\leftharpoonup (\leftarrow)	77	\leftrightarrowtriangle (\leftrightarrow)	86
\leftharpoonup (\leftarrow)	75	\leftrightarrowtriangle (\leftrightarrow)	89
\leftharpoonup (\leftarrow)	87	\leftrightharpoonup (\rightarrow)	86
\leftharpoonup (\leftarrow)	85	\leftrightharpoonup (\rightarrow)	94
\leftharpoonup (\leftarrow)	90	\leftrightharpoonupbar (\rightarrow)	83
\leftharpoonupdash (\Leftarrow)	90	\leftrightharpoonupdash (\rightarrow)	77
\leftarrowcurvearrow (\sim)	83	\leftrightharpoondown (\rightarrow)	91
\leftarrowleftarrows ($\Leftarrow\Rightarrow$)	76	\leftrightharpoondownup (\rightarrow)	85
\leftarrowleftarrows ($\Leftarrow\Rightarrow$)	75	\leftrightharpoondownup (\rightarrow)	80
\leftarrowleftarrows (\Leftarrow)	86	\leftrightharpoondownup (\rightarrow)	91
\leftarrowleftarrows (\Leftarrow)	81	\leftrightharpoons ($\Leftarrow\Rightarrow$)	77
\leftarrowleftarrows (\Leftarrow)	78	\leftrightharpoons ($\Leftarrow\Rightarrow$)	76
\leftarrowleftarrows (\Leftarrow)	89	\leftrightharpoons (\Leftarrow)	87
\leftarrowleftharpoons ($\Leftarrow\Rightarrow$)	77	\leftrightharpoons (\Leftarrow)	85
\leftarrowlsquigarrow (\sim)	83	\leftrightharpoons (\Leftarrow)	80
\leftarrowlsquigarrow (\sim)	78	\leftrightharpoons (\Leftarrow)	90
\Leftmapsto ($\Leftarrow\Rightarrow$)	81	\leftrightharpoonsdown (\Rightarrow)	90
\Leftmapsto (\Leftarrow)	81	\leftrightharpoonsdownfill	117
\Leftmapsto (\Leftarrow)	78	\leftrightharpoonsup (\Leftarrow)	90
\leftModels ($\Leftarrow\Rightarrow$)	55	\leftrightharpoonupdown (\rightarrow)	85
\leftmodels ($\Leftarrow\Rightarrow$)	57	\leftrightharpoonupdown (\rightarrow)	80
\leftmodels ($\Leftarrow\Rightarrow$)	55	\leftrightharpoonsdown (\Rightarrow)	90
\leftmoon (\mathbb{C})	132	\leftrightharpoonsdownfill	117
\leftmoon (\mathbb{C})	132	\leftrightharpoonsupdown (\rightarrow)	85
\leftmoon (\mathbb{C})	131	\leftrightharpoonupdown (\rightarrow)	80
\leftouterjoin (\bowtie)	126	\leftrightharpoonupdown (\rightarrow)	90
\lefttp (\circ)	25	\leftrightharpoonupdownup (\rightarrow)	90
\lefttpitchfork (\leftarrow)	95	\leftrightharpoonupup (\rightarrow)	90
\lefttpitchfork (\leftarrow)	93	\Leftrightline ($\Leftarrow\Rightarrow$)	55
\leftpointright ($\text{I}\!\!\!/\!\!\!\text{P}$)	142	\Leftrightline (\neg)	55
\leftproto (∞)	55	\leftrightspoon ($\circ\circ$)	94
\leftrcurvearrow (\curvearrowleft)	83	\leftrightsquigarrow ($\sim\sim\sim$)	76
\Leftrightarrow (\leftrightarrow)	75	\leftrightsquigarrow ($\sim\sim\sim$)	75
\Leftrightarrow (\leftrightarrow)	81	\leftrightsquigarrow ($\sim\sim$)	86
\Leftrightarrow (\leftrightarrow)	78	\leftrightsquigarrow ($\sim\sim$)	82
\Leftrightarrow (\leftrightarrow)	89	\leftrightsquigarrow ($\sim\sim$)	78
\Leftrightarrow (\leftrightarrow)	76	\leftrightsquigarrow ($\sim\sim$)	89
\Leftrightarrow (\leftrightarrow)	75	\leftrightharwavearrow (\leftrightarrow)	81
\Leftrightarrow (\leftrightarrow)	81	\leftrsquigarrow (\sim)	82
\Leftrightarrow (\leftrightarrow)	78	\leftrsquigarrow (\sim)	78
\Leftrightarrow (\leftrightarrow)	92	\leftrsquigarrow (\sim)	141
\Leftrightarrow (\leftrightarrow)	89	\leftslice (\lhd)	32
\Leftrightarrowaccent ($\text{I}\!\!\!/\!\!\!\text{A}$)	111	\leftslice (\lhd)	35
\Leftrightarrowcircle ($\Leftarrow\Rightarrow$)	89	\leftslice (\lhd)	55
\Leftrightarroweq ($\Leftarrow\Rightarrow$)	76	\leftspoon ($\circ-$)	94
\Leftrightarroweq ($\Leftarrow\Rightarrow$)	86	\leftspoon ($\circ-$)	93
\Leftrightarrows ($\Leftarrow\Rightarrow$)	76	\leftsquigarrow ($\sim\sim$)	76
\Leftrightarrows ($\Leftarrow\Rightarrow$)	75	\leftsquigarrow ($\sim\sim$)	76
\Leftrightarrows ($\Leftarrow\Rightarrow$)	86	\leftsquigarrow ($\sim\sim$)	86
\Leftrightarrows ($\Leftarrow\Rightarrow$)	81	\leftsquigarrow ($\sim\sim$)	82
\Leftrightarrows ($\Leftarrow\Rightarrow$)	78	\leftsquigarrow ($\sim\sim$)	89
\Leftrightarrows ($\Leftarrow\Rightarrow$)	89	\lefttail (\leftarrow)	25
\leftrightharpoonTriangle (\leftrightarrow)	86	\lefttail (\leftarrow)	61
\leftrightharpoonTriangle (\leftrightarrow)	76	\lefttherefore ($::$)	120

\leqslantdot (\lessdot)	70	\lesssim (\lessapprox)	69	\lhookdownarrow (\lhookdownarrow)	82
\leqslantdot (\lessdot)	69	\lessim (\lessapprox)	72	\lhookdownarrow (\lhookdownarrow)	78
\leqslcc (\lessdot)	70	\Letter (\boxtimes)	136	\lhookleftarrow (\lhookleftarrow)	82
\lescc (\lessdot)	71	\Letter (\boxtimes)	183	\lhookleftarrow (\lhookleftarrow)	78
\lescc (\lessdot)	72	\Letter (\boxtimes vs. \boxtimes)	227	\lhooknearrow (\lhooknearrow)	82
\lesdot (\lessdot)	70	letter-like symbols	100–102, 199–202	\lhooknearrow (\lhooknearrow)	78
\lesdot (\lessdot)	72	letters	see alphabets, 230, 231	\lhooknarrow (\lhooknarrow)	82
\lesdoto (\lessdot)	72	barred	230	\lhookrightarrow (\lhookrightarrow)	82
\lesdotor (\lessdot)	72	non-ASCII	15	\lhookrightarrow (\lhookrightarrow)	78
\lesg (\lessapprox)	70	slashed	231	\lhooksearrow (\lhooksearrow)	82
\lesges (\lessapprox)	72	variant Greek	99	\lhooksearrow (\lhooksearrow)	78
\less (<)	70	variant Latin	99	\lhookswarrow (\lhookswarrow)	82
\less (<)	69	less-than signs	see inequalities	\lhookswarrow (\lhookswarrow)	78
\lessapprox (\lessapprox)	68	\lessapprox (\lessapprox)	68	\lhookuparrow (\lhookuparrow)	82
\lessapprox (\lessapprox)	67	\lessapprox (\lessapprox)	67	\lhookuparrow (\lhookuparrow)	82
\lessapprox (\lessapprox)	71	\lfbowtie (\bowtie)	61	\lhookuparrow (\lhookuparrow)	78
\lessapprox (\lessapprox)	70	\lfilet (\lfilet)	104	\Libra (Ω)	132
\lessapprox (\lessapprox)	69	\lfloor (\lfloor)	109	\Libra (Δ)	133
\lessapprox (\lessapprox)	72	\lfloor (\lfloor)	103	\libra (\simeq)	131
\lesscc (\triangleleft)	70	\lfloor (\lfloor)	106	Lie derivative (\mathcal{L})	see alphabets, math
\lessclosed (\triangleleft)	70, 74	\lfloor (\lfloor)	105	\Liechtenstein ()	194
\lessclosed (\triangleleft)	69, 73	\lfloor (\lfloor)	107	life-insurance symbols	116, 235
\lessdot (\triangleleft)	68	\lftborder (\lftborder)	188	\lightbulb (\lightbulb)	239
\lessdot (\triangleleft)	67	\lftbotcorner (\lftbotcorner)	188	\lightbulb.mf (file)	236–238
\lessdot (\triangleleft)	35	\lftimes (\lftimes)	61	\lightbulb.sty (file)	239
\lessdot (\triangleleft)	70	\lfttopcorner (\lfttopcorner)	188	\lightbulb10.2602gf (file)	238
\lessdot (\triangleleft)	69	\LG (\LG)	134	\lightbulb10.dvi (file)	238
\lessdot (\triangleleft)	72	\lg (lg)	96	\lightbulb10.mf (file)	236–238
\lesseqgtr (\lessapprox)	68	\lgblkcircle (\bullet)	147	\lightbulb10.tfm (file)	239
\lesseqgtr (\lessapprox)	67	\lgblkcircle (\bullet)	148	\Lightning (\lightning)	136
\lesseqgtr (\lessapprox)	71	\lgblksquare (\blacksquare)	147	\Lightning (\lightning)	183
\lesseqgtr (\lessapprox)	70	\lgblksquare (\blacksquare)	148	\Lightning (\lightning vs. \lightning)	227
\lesseqgtrslant (\lessapprox)	69	\lgE (\lessapprox)	72	\lightning (\lightning)	76
\lesseqgtrslant (\lessapprox)	69	\lgroup (\lgroup)	104	\lightning (\lightning vs. \lightning)	227
\lesseqgqtr (\lessapprox)	68	\lgroup (\lgroup)	106	\lightning (\lightning)	81
\lesseqgqtr (\lessapprox)	67	\lgroup (\lgroup)	105	\lightning (\lightning)	78
\lesseqgqtr (\lessapprox)	71	\lgroup (\lgroup)	107	\lightning (\lightning)	181
\lesseqgqtr (\lessapprox)	70	\lgwhtcircle (\circ)	147	\Lilith (\emptyset)	133
\lesseqgqtr (\lessapprox)	70	\lgwhtcircle (\circ)	148	\lilyAccent (\Rightarrow)	168
\lesseqgqtr (\lessapprox)	69	\lgwhtsquare (\square)	147	\lilyDynamics{f} (f)	168
\lesseqgqtr (\lessapprox)	72	\lgwhtsquare (\square)	148	\lilyDynamics{m} (m)	168
\lesseqgtrslantgtr (\lessapprox)	70	\LHD (\blacktriangleleft)	32	\lilyDynamics{p} (p)	168
\lessgtr (\lessapprox)	68	\lhd (\triangleleft)	31, 32	\lilyDynamics{r} (r)	168
\lessgtr (\lessapprox)	67	\lhd (\triangleleft)	70	\lilyDynamics{s} (s)	168
\lessgtr (\lessapprox)	71	\lhd (\triangleleft)	69, 73	\lilyDynamics{z} (z)	168
\lessgtr (\lessapprox)	70	\lhd (\triangleleft)	36, 149	\lilyEspressivo (\leftrightarrow)	168
\lessneqqgtr (\lessapprox)	69	\lhd bend ($\text{\hspace{-0.05cm}\text{\scriptsize\S}}$)	181	\lilyGlyph{...} (\mathfrak{x})	178
\LessOrEqual (\leq)	122	\lhook (\lhook)	96	\lilyGlyph{...} (\mathfrak{b})	178
\lessssim (\lessapprox)	68			\lilyGlyph{...} (\mathfrak{b})	178
\lessssim (\lessapprox)	67			\lilyGlyph{...} (\mathfrak{b})	178
\lessssim (\lessapprox)	71			\lilyGlyph{...} (\mathfrak{b})	178
\lessssim (\lessapprox)	70			\lilyGlyph{...} (\mathfrak{b})	178

\LinearACLXXXII (ቂ)	156
\LinearACLXXXIII (ቃ)	156
\LinearACLXXXIV (ቄ)	156
\LinearACLXXXIX (ቅ)	156
\LinearACLXXXV (ቆ)	156
\LinearACLXXXVI (ቈ)	156
\LinearACLXXXVII (቉)	156
\LinearACLXXXVIII (ቊ)	156
\LinearACLXXXIX (ቋ)	156
\LinearACV (ቌ)	154
\LinearACVI (ቍ)	154
\LinearACVII (቏)	154
\LinearACVIII (ቈ)	155
\LinearACX (ቊ)	155
\LinearACXI (ቋ)	156
\LinearACXCII (ቌ)	156
\LinearACXCIII (ቊ)	156
\LinearACXCIV (ቋ)	156
\LinearACXCIX (ቈቁ)	154
\LinearACXCV (ቋ)	156
\LinearACXCVI (ቂ)	156
\LinearACXCVII (ቊ[]	154
\LinearACXCVIII (቉)	154
\LinearACXI (ቊ)	155
\LinearACXII (ቃ)	155
\LinearACXIII (ቊ)	155
\LinearACXIV (ቈ)	155
\LinearACXIX (ቈ)	155
\LinearACXL (ቊ)	155
\LinearACXLII (ቊ)	155
\LinearACXLIII (ቊ)	155
\LinearACXLIV (ቊ)	155
\LinearACXLIX (቉)	155
\LinearACXLV (→)	155
\LinearACXLVI (ቂ)	155
\LinearACXLVII (ቊ)	155
\LinearACXLVIII (ቊ)	155
\LinearACXV (ሱ)	155
\LinearACXVI (ሱ)	155
\LinearACXVII (ሱ)	155
\LinearACXVIII (ቈ)	155
\LinearACXX (ቈ)	155
\LinearACXXI (ቈ)	155
\LinearACXXII (ቈ)	155
\LinearACXXIII (ቈ)	155
\LinearACXXIV (ቈ)	155
\LinearACXXIX (ቈ)	155
\LinearACXXV (ቈ)	155
\LinearACXXVI (ቈ)	155
\LinearACXXVII (ቈ)	155
\LinearACXXVIII (ቈ)	155
\LinearACXXX (ቈ)	155
\LinearACXXXII (ቈ)	155
\LinearACXXXIII (ቈ)	155
\LinearACXXXIV (ቈ)	155
\LinearACXXXIX (ቈ)	155
\LinearACXXXV (ቈ)	155
\LinearACXXXVI (ቈ)	155
\LinearACXXXVII (ቈ)	155
\LinearACXXXVIII (ቈ)	155
\LinearAI (ቈ)	154
\LinearAII (ቈ)	154
\LinearAIII (ቈ)	154
\LinearAIV (ቈ)	154
\LinearAIX (ቈ)	154
\LinearAL (ቈ)	155
\LinearALI (ቈ)	155
\LinearALII (ቈ)	155
\LinearALIII (ቈ)	155
\LinearALIV (ቈ)	155
\LinearALIX (ቈ)	156
\LinearALV (ቈ)	155
\LinearALVI (ቈ)	155
\LinearALVII (ቈ)	155
\LinearALVIII (ቈ)	155
\LinearALX (ቈ)	156
\LinearALXI (ቈ)	156
\LinearALXII (ቈ)	156
\LinearALXIII (ቈ)	156
\LinearALXIV (ቈ)	156
\LinearALXIX (ቈ)	156
\LinearALXV (ቈ)	156
\LinearALXVI (ቈ)	156
\LinearALXVII (ቈ)	156
\LinearALXVIII (ቈ)	156
\LinearALXX (ቈ)	156
\LinearALXXI (ቈ)	156
\LinearALXXII (ቈ)	156
\LinearALXXIII (ቈ)	156
\LinearALXXIV (ቈ)	156
\LinearALXXIX (ቈ)	156
\LinearALXXV (ቈ)	156
\LinearALXXVI (ቈ)	156
\LinearALXXVII (ቈ)	156
\LinearALXXVIII (↑)	156
\LinearALXXX (ቈ)	156
\LinearALXXXI (ቈ)	156
\LinearALXXXII (ቈ)	156
\LinearALXXXIII (ቈ)	156
\LinearALXXXIV (ቈ)	156
\LinearALXXXIX (ቈ)	156
\LinearALXXXV (↑)	156
\LinearALXXXVI (ቈ*)	156
\LinearALXXXVII (ቈ)	156
\LinearALXXXVIII (ቈ)	156
\LinearALXXXX (ቈ)	156
\LinearAV (ቈ)	154
\LinearAVI (ቈ)	154
\LinearAVII (ቈ)	154
\LinearAVIII (ቈ)	154
\LinearAX (ቈ)	155
\LinearAXCI (ቈ)	156
\LinearAXCII (ቈ)	156
\LinearAXCIII (ቈ)	156
\LinearAXCIV (ቈ)	156
\LinearAXCIX (ቈ)	154
\LinearAXCV (ቈ)	156
\LinearAXCVI (ቈ)	156
\LinearAXC VII (ቈ)	156
\LinearAXC VIII (ቈ)	156
\LinearAXI (ቈ)	155
\LinearAXII (ቈ)	155
\LinearAXIII (ቈ)	155
\LinearAXIV (ቈ)	155
\LinearAXIX (ቈ)	155
\LinearAXL (ቈ)	155
\LinearAXLI (ቈ)	155
\LinearAXLII (ቈ)	155
\LinearAXLIII (ቈ)	155
\LinearAXLIV (ቈ)	155
\LinearAXLIX (ቈ)	155
\LinearAXLXV (ቈ)	155
\LinearAXV (ቈ)	155
\LinearAXVI (ቈ)	155
\LinearAXVII (ቈ)	155
\LinearAXVIII (ቈ)	155
\LinearAXV (ቈ)	155
\LinearAXVI (ቈ)	155
\LinearAXVII (ቈ)	155
\LinearAXVIII (ቈ)	155
\LinearAXXII (ቈ)	155
\LinearAXXIII (ቈ)	155
\LinearAXXIV (ቈ)	155
\LinearAXXV (ቈ)	155
\LinearAXXVI (ቈ)	155
\LinearAXXVII (ቈ)	155
\LinearAXXVIII (ቈ)	155
\linearb (package)	157, 158, 247, 248
\linefeed (ሱ)	86
\linefeed (ሱ)	89
\Lineload (ቈ)	136
linguistic symbols	17–20
Lisa (Lisa)	189
Lithuania ()	194



liturgical music	165
\lJoin (\bowtie)	53
\lJoin (\bowtie)	35
\LK (\vdash)	134
\ll (\ll)	68
\ll (\ll)	67
\ll (\ll)	70
\ll (\ll)	69
\ll (\ll)	72
\llangle ($\langle\!\langle$)	105
\llangle ($\langle\!$)	103
\llap	25, 233
\llarc (\circ)	126
\llblacktriangle (\blacktriangleleft)	148
\llbracket (\llbracket)	104
\llbracket (\llbracket)	109
\llceil (\llceil)	102
\llcorner (\llcorner)	102
\llcorner (\llcorner)	102
\llcorner (\llcorner)	102
\llcorner ()	106
\llcorner	
\llcorner ()	105
\llcorner	
\llcorner (\llcorner)	103
\llcurly (\llcurly)	54
\llcurly (\llcurly)	60
\LLeftarrow (\LLeftarrow)	89
\LLeftarrow (\LLeftarrow)	75
\LLeftarrow (\LLeftarrow)	86
\LLeftarrow (\LLeftarrow)	81
\LLeftarrow (\LLeftarrow)	78
\LLeftarrow (\LLeftarrow)	89
\lfloor	102
\lll (\lll)	68
\lll (\lll)	67
\lll (\lll vs. \lll)	227
\lll (\lll)	71
\lll (\lll)	70
\lll (\lll)	69
\lll (\lll)	72
\llless	see \lll
\llless (\lll)	70
\llless (\lll)	69
\llless (\lll)	72
\llnest (\lll)	72
\llparenthesis ($\langle\!\langle$)	102
\llparenthesis ($\langle\!\langle$)	103
\lltriangle (\blacktriangleleft)	148
\lmoustache (\int)	104
\int	
\lmoustache (\int)	106
\lmoustache (\int)	105
\lmoustache (\int)	104
\ln (ln)	96
\lnapprox (\approx)	68
\lnapprox (\approx)	67
\lnapprox (\approx)	71
\lnapprox (\approx)	70
\lnapprox (\approx)	69
\lnapprox (\approx)	72
\lneq (\lneq)	68
\lneq (\lneq)	67
\lneq (\lneq)	71
\lneq (\lneq)	70
\lneq (\lneq)	72
\lneqq (\lneqq)	68
\lneqq (\lneqq)	67
\lneqq (\lneqq)	71
\lneqq (\lneqq)	70
\lneqq (\lneqq)	69
\lneqq (\lneqq)	72
\lnot	see \neg
\lnot (\neg)	125
\lnot (\neg)	125
\lnot (\neg)	126
\lnsim (\approx)	68
\lnsim (\approx)	67
\lnsim (\approx)	71
\lnsim (\approx)	70
\lnsim (\approx)	69
\lnsim (\approx)	71
\mathrm{LO} (o)	134
local ring (\mathcal{O})	see alphabets, math
\log (log)	96, 240
log-like symbols	96, 240
logic (package)	135
logic gates	135
logical operators	
and	see \wedge
not	see \neg and \sim
or	see \vee
\logof (\otimes)	53
lollipop	see \multimap
long s (f)	229
long division	112, 114
long-branch runes	see normal runes
\longa ($\text{\H{a}}$)	164
\longa (\u0251)	189
\longcastling (O-O-O)	186
\longdashv ($\overline{\dashv}$)	58
\longdashv ($\overline{\dashv}$)	61
longdiv (package)	112
longdiv.tex (file)	112
\longdivision ($\overline{\overline{\overline{\mid}}}$)	112, 114
\longhookrightarrow ($\overleftarrow{\rightarrow}$)	92
\longleadsto (\rightsquigarrow)	82
\Longleftarrow (\Longleftarrow)	75
\Longleftarrow (\Longleftarrow)	77
\Longleftarrow (\Longleftarrow)	81
\Longleftarrow (\Longleftarrow)	89
\Longleftarrow (\Longleftarrow)	75
\Longleftharpoondown ($\overleftarrow{\overbrace{}}$)	92
\Longleftharpoonup ($\overbrace{}\overleftarrow{}$)	92
\Longleftarrow (\Longleftarrow)	75
\Longleftarrow (\Longleftarrow)	75
\Longleftarrow (\Longleftarrow)	77
\Longleftarrow (\Longleftarrow)	81
\Longleftarrow (\Longleftarrow)	89
\Longleftarrow (\Longleftarrow)	77
\Longleftarrow (\Longleftarrow)	81
\Longleftarrow (\Longleftarrow)	92
\Longleftarrow (\Longleftarrow)	89
\Longleftarrow (\Longleftarrow)	81
\Longmapsfrom (\Longmapsfrom)	76
\Longmapsfrom (\Longmapsfrom)	58, 81
\Longmapsfrom (\Longmapsfrom)	89
\longmapsfrom (\longmapsfrom)	76
\longmapsfrom (\longmapsfrom)	58, 81
\longmapsfrom (\longmapsfrom)	92
\longmapsfrom (\longmapsfrom)	89
\Longmapsto (\Longmapsto)	76
\Longmapsto (\Longmapsto)	81
\Longmapsto (\Longmapsto)	87
\longmapsto (\longmapsto)	77
\longmapsto (\longmapsto)	75
\longmapsto (\longmapsto)	81
\longmapsto (\longmapsto)	92
\longmapsto (\longmapsto)	87
\longmapsto (\longmapsto)	87
\longmapsto (\longmapsto)	130
\LongPulseLow ($\overline{\overbrace{}}$)	130
\LongPulseHigh ($\overbrace{}\overline{}$)	130
\Longrightarrow (\Longrightarrow)	75
\Longrightarrow (\Longrightarrow)	77
\Longrightarrow (\Longrightarrow)	81
\Longrightarrow (\Longrightarrow)	87
\Longrightarrow (\Longrightarrow)	77
\Longrightarrow (\Longrightarrow)	75
\Longrightarrow (\Longrightarrow)	81
\Longrightarrow (\Longrightarrow)	92
\Longrightarrow (\Longrightarrow)	87
\longrightarrow (\longrightarrow)	87
\longrightarrow (\longrightarrow)	58
\longrightharpoondown ($\overbrace{}\overleftarrow{}$)	92
\longrightharpoonup ($\overleftarrow{\overbrace{}}$)	92
\longrightsquigarrow (\rightsquigarrow)	82
\longrightsquigarrow (\rightsquigarrow)	87
\longrightwavearrow (\rightsquigarrow)	81
\looparrowdownleft ($\leftarrow\downarrow$)	76
\looparrowdownleft ($\leftarrow\downarrow$)	87
\looparrowdownright ($\rightarrow\downarrow$)	76

\looparrowdownright (↗)	87
\looparrowleft (↖)	76
\looparrowleft (↖)	75
\looparrowleft (↖)	87
\looparrowleft (↖)	81
\looparrowleft (↖)	77
\looparrowleft (↖)	87
\looparrowright (↗)	76
\looparrowright (↗)	75
\looparrowright (↗)	87
\looparrowright (↗)	82
\looparrowright (↗)	77
\looparrowright (↗)	87
\Loosebearing (Δ)	136
\lor	see \vee
\lor (∨)	35
\lor (∨)	36
\LowerDiamond (◆)	150
lowering . . . see \textlowering	
\lowint (ʃ)	49
\lowintsl (ʃ)	51
\lowintup (ʃ)	51
\lozenge (◊)	124
\lozenge (◊)	147
\lozenge (◊)	147
\lozenge (◊)	147
\lozenge (◊)	147
\lozengedot (◊)	147
\lozengeminus (◊)	147
\lozengeminus (◊)	40
lozenges	124, 147–149, 173–178, 181
\Lparen (⟨)	129
\lParen (⟨⟨)	108
\lParen (⟨)	107
\lparen (⟨)	107
\Lparengtr (⟩)	103
\lparenless (⟨)	103
\lrarc (⌢)	126
\rlblacktriangle (▲)	148
\rcorner (⌢)	102
\rcorner (⌢)	102
\rcorner (⌢)	102
\rcorner (⌢)	106
\rcorner (⌢)	105
\rcorner (⌢)	103
\rJoin	see \Join
\rtimes (⊗)	53
\rtimes (⊗)	35
\rtriangle (▷)	148
\rtrianglereq (≿)	74
\lsem (⟦)	107
\lsem (⟧)	105
\semantic	see \ldbrack
\lsf (⤵)	164
\lsfz (⤶)	164
\Lsh (⤵)	76
\Lsh (⤶)	75
\Lsh (⤶)	86
\Lsh (⤶)	82
\Lsh (⤶)	77
\Lsh (⤶)	87
\lsime (⤷)	71
\lsimg (⤷)	71
\lsqhook (⤸)	61
\Lsteel (⤹)	136
\Lt (⤻)	71
\Lt (⤻)	71
\ltcc (⤻)	71
\ltcc (⤻)	71
\ltcir (⤻)	71
\ltcir (⤻)	71
\ltimes (⤻)	33
\ltimes (⤻)	31
\ltimes (⤻)	35
\ltimes (⤻)	34, 35
\ltimes (⤻)	33
\ltimes (⤻)	36
\ltimesblack (⤻)	35
\ltlarr (⤻)	71
\ltquest (⤻)	71
\ltriple	109
\ltrivb (⤻)	74
\LU (⤻)	134
LuaL ^A T _E X	163
Luecking, Dan	233
\Luxembourg ()	194
\lVert ()	104
\lVert ()	109
\lVert ()	106
\lvert ()	104
\lvert ()	106
\lvertneqq (⤻)	68
\lvertneqq (⤻)	67
\lvertneqq (⤻)	71
\lvertneqq (⤻)	71
\lvertneqq (⤻)	69
\lvertneqq (⤻)	71
\lVvert ()	106
\Lvzigzag (⤶)	103
\lvzigzag (⤶)	103
\wave (⤵)	108
\Wavy (⤵)	105
\M	16
\M (⤵)	188
\m	16
\m (⤵)	188
\ma (⤵)	188
\Macedonia (⤵)	194
\macron (⤵)	24
macron (⤵)	see accents
	
\Maggie (⤵)	189
magic (package)	224, 247
<i>Magic: The Gathering</i> symbols	224
magical signs	190
\magnon (⤵)	138
majuscules	97
\makeatletter	233
\makeatother	233
\MALE (♂)	136
\Male (σ)	136
male	131–133, 136, 197–202, 206–209
\male (σ)	136
\male (σ)	136
\MaleMale (♂♂)	136
\Malta ()	194
\maltese (✠)	15
\maltese (✠)	125
\maltese (✠)	125
\maltese (✠)	125
\maltese (✠)	126
man	153, 182, 197, 204–206, 217–221
\manboldkidney (◎)	181
\manconcentriccircles (◎◎)	181
\manconcentricdiamond (◇◇)	181
\mancone (◎)	181
\mancube (☒)	181
\manerrarrow (⤵⤵)	181
\ManFace (⤵)	182
\manfilledquartercircle (◐)	181
manfnt (package)	181, 247
\manhpennib (—)	181
\animpossiblecube (☒☒)	181
\mankidney (◎)	181
\manlhpennkidney (◎)	181
\manpenkidney (◎)	181
\manquadrifolium (❖)	181
\manquartercircle (⤵)	181

\manrotatedquadrifolium (⌚)	181
\manrotatedquartercircle (⌚)	181
\manstar (⭐)	181
\mantiltpennib (⤠)	181
\mantriangledown (▼)	181
\mantriangleleft (►)	181
\mantriangleup (▲)	181
\manvpennib (⤠)	181
map symbols	204–206
\Mappedfromchar ()	95
\mappedfromchar ()	95
maps	194
\Mapsdown (⤡)	82
\mapsdown (⤢)	86
\mapsdown (⤣)	82
\mapsdown (⤤)	87
\Mapsfrom (⤥)	76
\Mapsfrom (⤥)	86
\Mapsfrom (⤥)	82
\Mapsfrom (⤥)	87
\mapsfrom (⤥)	76
\mapsfrom (⤥)	86
\mapsfrom (⤥)	82
\mapsfrom (⤥)	92
\mapsfrom (⤥)	87
\Mapsfromchar ()	95
\mapsfromchar ()	96
\Mapsto (⤦)	76
\Mapsto (⤦)	86
\Mapsto (⤦)	83
\Mapsto (⤦)	83
\Mapsto (⤦)	87
\mapsto (⤦)	75
\mapsto (⤦)	86
\mapsto (⤦)	82
\mapsto (⤦)	78
\mapsto (⤦)	92
\mapsto (⤦)	87
\Mapstochar ()	95
\Mapstochar ()	95
\mapstochar ()	95
\mapstochar ()	96
\Mapsup (⤧)	83
\mapsup (⤧)	86
\mapsup (⤧)	83
\mapsup (⤧)	87
\marcato (⤧)	168
\marcatoDown (⤧)	168
	
\Marge (⤧)	189
\markera (⤧)	186
\markerb (⤧)	186
married	see \textmarried
\Mars (♂)	132
\Mars (☿)	132
\Mars (♂)	133
\mars (♂)	131
marvosym (package)	25, 26, 122, 132, 134, 136, 141, 143, 182, 192, 227
masonic cipher	191
\mate (#)	186
material biconditional	<i>see</i> \leftrightarrowarrow and \equiv
material conditional	<i>see</i> \rightarrowarrow and \supset
material equivalence	<i>see</i> \leftrightarrowarrow and \equiv
material implication	<i>see</i> \rightarrowarrow and \supset
material nonimplication	<i>see</i> \rightarrowarrow and \nsupset
math alphabets	128
\mathabx (package)	30, 33, 37, 43, 54, 65, 68, 73, 76, 77, 95, 100, 102, 104, 110, 114, 122, 124, 132, 186, 226, 227, 247
\mathaccent	230, 231
\mathbb	128, 129
\mathbbm	128
\mathbbmss	128
\mathbbmtt	128
\mathbbol (package)	128, 129
\mathbf	241
\mathbin	239
\mathbold	241
\mathcal (euscript package option)	128
\mathcal	128, 131
\mathcent (¢)	100
\mathchoice	232
\mathclose	239
\mathcloud (⤧)	40
\mathcolon (:)	120
\mathcomp (package)	121
\mathdesign (package)	26, 37, 51, 101, 108, 127, 247
\mathdollar (\$)	30
\mathdollar (\$)	101
\mathdots (package)	110, 119, 120, 234, 247
\mathds	128
\mathellipsis (...)	30
\mathellipsis (...)	120
mathematical symbols	30–129
\mathfrak	128
\mathghost (⤧)	40
\mathit	128
\mathleftghost (⤧)	40
\mathnormal	128
\mathop	239
\mathopen	239
\mathord	239
\mathpalette	232, 233
\mathparagraph (¶)	30
\mathparagraph (¶)	101
\mathpunct	239
\mathratio (:)	120
\mathrel	230, 239
\mathrightghost (⤧)	40
\mathring (⌚)	111
\mathring (⌚)	110, 112
\mathrm	128
\mathrsfs (package)	128, 247
\mathscr (euscript package option)	128
\mathscr (urwchancal package option)	128
\mathscr	128
\mathsection (§)	30
\mathsection (§)	126
\mathslash (⤧)	106
\mathslash (/)	107
\mathspec (package)	97
\mathspec.sty (file)	97
\mathsterling (£)	100
\mathsterling (£)	30
\mathsterling (£)	101
\mathtools (package)	30, 62, 92, 114, 116, 247
\mathunderscore (_)	30
\mathvisiblespace (_)	126
\mathwitch (⤧)	40
\mathwitch* (⤧)	40
\max (max)	96
\maxima (⤧)	164
Maxwell-Stefan diffusion coefficient	<i>see</i> \DH
\maxwellDistrib (ℳ)	138
\maya	122
Mayan numerals	122
\Mb (⤧)	188
\mb (⤧)	188
\Mbb (⤧)	188
\mBb (⤧)	188
\mbB (⤧)	188
\mbb (⤧)	188
\mbboard (package)	128, 129, 247
\mbbx (⤧)	188
\mbox	232, 233
\MC (ℳ)	133
\mdblkcircle (●)	148

\mdblkdiamond (◆)	39
\mdblkdiamond (◆)	148
\mdblklozenge (◆)	147
\mdblklozenge (◆)	148
\mdblksquare (■)	39
\mdblksquare (■)	148
\mdlgblkcircle (●)	39
\mdlgblkcircle (●)	148
\mdlgblkdiamond (◆)	39
\mdlgblkdiamond (◆)	148
\mdlgblklozenge (◆)	147
\mdlgblklozenge (◆)	40, 149
\mdlgblksquare (■)	39
\mdlgblksquare (■)	148, 149
\mdlgwhtcircle (○)	39
\mdlgwhtcircle (○)	40
\mdlgwdiamond (◇)	39
\mdlgwdiamond (◇)	148
\mdlgwhtlozenge (◊)	147
\mdlgwhtlozenge (◊)	148
\mdlgwhtsquare (□)	39
\mdlgwhtsquare (□)	148, 149
\mdsmbblkcircle (●)	148
\mdsmbblksquare (■)	148
\mdsmwhtcircle (○)	148
\mdsmwhtsquare (□)	148
\mdwhtcircle (○)	148
\mdwhtdiamond (◇)	39
\mdwhtdiamond (◇)	148
\mdwhtlozenge (◊)	147
\mdwhtlozenge (◊)	148
\mdwhtsquare (□)	39
\mdwhtsquare (□)	149
mdwmath (package)	116, 247, 248
\measangledtosw (⤿)	123
\measangledtose (⤿)	123
\measangleldtosw (⤿)	123
\measanglelutonw (⤿)	123
\measanglerdtose (⤿)	123
\measanglerutone (⤿)	123
\measangleltonw (⤿)	123
\measangleurtone (⤿)	123
\measeq (⤿)	61
\measuredangle (⤿)	124
\measuredangle (⤿)	123
\measuredangle (⤿)	123
\measuredangle (⤿)	123
\measuredangle (⤿)	123
\measuredangle (⤿)	123
\measuredangle (⤿)	123
\measuredangle (⤿)	123
\measuredangleleft (⤿)	123
\measuredangleleft (⤿)	123
\measuredrightangle (⤿)	123
\measuredrightangle (⤿)	123
\measuredrightangle (⤿)	123
\measuredrightangledot (⤿)	123
mechanical scaling	236, 239
\medbackslash (＼)	34, 35
\medblackcircle (●)	39
\medblackdiamond (◆)	39
\medblacklozenge (◆)	147
\medblacksquare (■)	39
\medblackstar (★)	39
\medblackstar (★)	149
\medblacktriangledown (▼)	38, 74
\medblacktriangleleft (◀)	38, 74
\medblacktriangleright (▶)	38, 74
\medblacktriangleup (▲)	38, 74
\medbullet (●)	32
\medcirc (○)	32
\medcircle (○)	38
\medcircle (○)	33
\meddiamond (◇)	38
\meddiamond (◇)	38
media control symbols	182, 199–202
medieval runes	162
\medlozenge (◊)	147
\medlozenge (◊)	147
\medslash (／)	34, 35, 38
\medslash (／)	33
\medsquare (□)	38
\medsquare (□)	38
\medstar (★)	39
\medstar (★)	38
\medstarofdavid (✡)	147
\medtriangledown (▽)	38, 74
\medtriangledown (▽)	38, 73
\medtriangleleft (⤿)	38, 74
\medtriangleleft (⤿)	38, 73
\medtriangleleft (⤿)	38, 74
\medtriangleright (▶)	38, 74
\medtriangleright (▶)	38, 73
\medtriangleup (△)	38, 74
\medtriangleup (△)	38, 73
\medvert (⠇)	33, 34
\medvertdot (⠇)	33
\medwhitestar (★)	38
\medwhitestar (★)	149
Mellin transform (\mathcal{M})	see alphabets, math
membership	see \in
\Mercury (☿)	132
\Mercury (☿)	132
\Mercury (☿)	133
\mercury (☿)	131
\merge (⤿)	32
\merge (⤿)	35
METAFONT	12, 129, 236–239
METAFONTbook symbols	181
\metalbond (₩)	138
\meterplus (✚)	164
\method (ℳ)	138
metre (package)	24, 110, 188, 247
metre	188
metrical symbols	188, 189
mezzo (m)	168, 179
.mf files	12, 204, 236
\mglgwtcircle (○)	149
\mglgwtlozenge (◊)	149
\mho (℧)	124
\mho (℧)	99
mama (emf package option)	131
micro	see \textmu
\micro (μ)	130
Microsoft® Windows®	244
\mid ()	52, 105
\mid ()	58
\mid ()	61
\midbarvee (∨)	36
\midbarwedge (∧)	36
\midcir (⌚)	94
\midcir (⌚)	61
middle	103
\middlebar (▬)	111
\middleslash (▬)	111
\midtilde (˜)	25
MIL-STD-806	135
millesimal sign	see \textperthousand
milstd (package)	135, 247, 248
\min (min)	96, 240
\MineSign (❖)	182
minim	see musical symbols
\minim (♪)	166
\minimDotted (♪.)	166
\minimDottedDouble (♪.)	166
\minimDottedDoubleDown (♪˘)	166
\minimDottedDown (♪˘)	166
\minimDown (♪˘)	166
Minkowski space (ℳ)	see alphabets, math
minus	see \textminus
\minus (-)	34
\minus (-)	33
minus, double-dotted (÷)	see \div
\minuscolon (:-)	64
\minuscoloncolon (:-:)	64
\minusdot (˘)	34
\minusdot (˘)	33
\minusdot (˘)	36
\minusdots (˘˘)	34
\minusdots (˘˘)	36
\minushookdown (˘˘)	125
\minushookdown (˘˘)	125
\minushookup (˘˘)	35
\minushookup (˘˘)	125
\minuso (⊖)	32, 231
\minuso (⊖)	35

\minusrdots (÷)	34
\minusrdots (÷)	36
minutes, angular . . . see \prime	
miscellaneous symbols	124, 125,
127, 152, 181–198, 203	
“Missing \$ inserted”	30
\mlcp (◊)	61
\Mmappedfromchar (◊)	95
\Mmappedfromchar (◊)	95
\Mmapstochar (◊)	95
\Mmapstochar (◊)	95
MnSymbol (package)	30, 33, 34,
38, 46, 47, 55–57, 66, 69, 73, 77–81, 93, 94, 99, 100, 105, 111–113, 120, 123, 125, 147, 151, 163, 247	
\Moai (◊)	197
\Mobilefone (◊)	136
\mod	96
\models (=)	52, 230
\models (\models)	58
\models (\models)	56
\models (\models)	61
\modtwosum (Σ)	48
\modtwosum (Σ)	49
moduli space . . . see alphabets, math	
\Moldova (◊)	194
monetary symbols .	26, 27, 129
\Montenegro (◊)	194
monus . . . see \dotdiv	
\moo (±)	32
\moo (±)	35
\Moon (⌚)	132
\Moon (⌚)	132
\Moon (⌚)	133
moon . . . 131–133, 191, 206–209	
\MoonPha	191
moonphase (package)	206, 247
\Mordent (❖)	164
\mordent (❖)	164
\morepawns (>)	186
\moreroom (○)	186
\Mountain (▲)	183
mouse . . . see \ComputerMouse	
\MoveDown (▼)	182
\overlay	233
\MoveUp (▲)	182
\mp (∓)	31
\mp (∓)	35
\mp (∓)	34
\mp (∓)	34
\mp (∓)	36
\Mu (M)	97
\mu (μ)	97
multiline braces	115
\multimap (→)	52, 53
\multimap (→)	60
\multimap (→)	94
\multimap (→)	93
\multimap (→)	61
\multimapboth (○→)	53
\multimapboth (○→)	60
\multimapboth (○→)	64
\multimapbothvert (◊)	53
\multimapbothvert (◊)	60
\multimapdot (→)	53
\multimapdot (→)	60
\multimapdotboth (●→)	53
\multimapdotboth (●→)	60
\multimapdotbothA (○→)	53
\multimapdotbothA (○→)	60
\multimapdotbothB (●→)	53
\multimapdotbothB (●→)	60
\multimapdotbothBvert (◊)	53
\multimapdotbothBvert (◊)	60
\multimapdotbothvert (◊)	53
\multimapdotbothvert (◊)	60
\multimapdotinv (●→)	53
\multimapdotinv (●→)	60
\multimapinv (○→)	53
\multimapinv (○→)	60
\multimapinv (○→)	94
\multimapinv (○→)	61
multiple accents per character . . . 234	
\MultiplicationDot (·)	122
multiplicative disjunction . . . see \bindnasrepma, \invamp, and \parr	
\Mundus (⌚)	182
\muon (μ⁻)	138
Museum of Icelandic Sorcery and Witchcraft	191
musical symbols . . . 28, 163–180, 197–202	
\musixgre (package)	165
\musixlit (package)	165
\musixer (package)	165
MusiXTEX	164, 165
\musixtex (package)	247, 248
\muup (μ)	98
\MVAt (@)	182
\MVComma (,)	122
\MVDivision (/)	122
\MVEight (8)	122
\MVFive (5)	122
\MVFour (4)	122
\MVLeftBracket ((122
\MVMinus (-)	122
\MVMultiplication (×)	122
\MVNine (9)	122
\MVOOne (1)	122
\MVPPeriod (.)	122
\MVPlus (+)	122
\MVRightArrow (→)	122
\MVRightBracket ())	122
\MVSeven (7)	122
\MVSix (6)	122
\MVThree (3)	122
\MVTwo (2)	122
\MVZero (0)	122
N	
n (†)	162
\nabla (▽)	124
\nabla (▽)	125
\nabla (▽)	126
\nacwcirclearrowdown (▷)	83
\nacwcirclearrowleft (◁)	83
\nacwcirclearrowright (▷)	83
\nacwcirclearrowup (▷)	83
\nacwgpcirclearrow (▷)	84
\naclefttarcarrow (↶)	83
\nacnearcarrow (↖)	83
\nacnwarcarrow (↖)	83
\nacwopencirclearrow (▷)	84
\nacwoverarcarrow (⤠)	83
\nacwrightarcarrow (⤡)	83
\nacwsearcarrow (⤢)	83
\nacwsuararrow (⤣)	83
\nacwunderarcarrow (⤤)	83
\NAK (\$)	135
NAND gates	135
	
\NANDd ()	135
	
\NAND1 ()	135
	
\NANDr ()	135
	
\NANDu ()	135
\approx (≈)	54
\approxeq (≈)	59
\approxeq (≈)	56
\approx (≈)	62
\approxeq (≈)	54
\approxeq (≈)	59
\approxeq (≈)	56
\approxeqq (≈)	62
\approxident (≈)	59
\narceq (≠)	59, 95
\nassert ()	59
\nassert (≠)	59
\nasyp (≠)	54
\nasyp (≠)	59, 95
\nasyp (≠)	94
\nasyp (≠)	62
\Natal (Nº)	133
nath (package)	103, 109, 247
\NATURAL (N)	96
\Natural (N)	96

\natural (⌚)	163	\ncurlyeqprec (⌚)	54	\nddttstyle (⌚)	63
\natural (⌚)	163	\ncurlyeqprec (⌚)	59	\ndiagdown (×)	57
\natural (⌚)	163	\ncurlyeqprec (⌚)	56	\ndiagup (×)	57
\natural (⌚)	167	\ncurlyeqsucc (⌚)	54	\ndivides (+)	57
\natural (⌚)	163	\ncurlyeqsucc (⌚)	59	\nDoteq (≠)	59
\natural (⌚)	163	\ncurlyeqsucc (⌚)	56	\nDoteq (≠)	56
natural numbers (ℕ)	see alphabets, math	\ncurvearrowdownup (⤒)	79	\ndoteq (≠)	59
\nbackapprox (⌚)	56	\ncurvearrowleft (⤓)	84	\ndoteq (≠)	56
\nbackapproxeq (⌚)	56	\ncurvearrowleft (⤓)	80	\ndoublefrown (⤔)	94
\nbackcong (⌚)	59	\ncurvearrowleftright (⤓)	79	\ndoublefrowneq (⤔)	94
\nbackcong (⌚)	56	\ncurvearrownesw (⤓)	79	\ndoublesmile (⌚)	94
\nbackeqsim (⌚)	56	\ncurvearrownwse (⤓)	79	\ndoublesmilee (⌚)	94
\nbacksimeq (⌚)	54	\ncurvearrowright (⤓)	84	\nDownarrow (⤒)	84
\nbacksimeq (⌚)	59	\ncurvearrowright (⤓)	80	\nDownarrow (⤒)	79
\nbacksimeq (⌚)	59	\ncurvearrowrightleft (⤓)	79	\ndownarrow (⤓)	84
\nbacksimeq (⌚)	56	\ncurvearrowsenw (⤓)	79	\ndownarrow (⤓)	79
\nbacksimeq (⌚)	54	\ncurvearrowswne (⤓)	79	\ndownarrowtail (⤓)	84
\nbacksimeq (⌚)	59	\ncurvearrowupdown (⤒)	79	\ndownarrowtail (⤓)	79
\nbacksimeq (⌚)	56	\ncwcirclearrowdown (⤒)	83	\ndownAssert (⤔)	59
\nbacktriplesim (⌚)	56	\ncwcirclearrowleft (⤒)	83	\ndownassert (⤔)	59
\nBarv (⤔)	59	\ncwcirclearrowright (⤒)	83	\ndownbkarrow (⤓)	84
\nbarV (⤔)	59	\ncwcirclearrowup (⤒)	83	\ndownblackspoon (⤓)	94
\nbdeleftarrow (⤓)	83	\ncwgapcirclearrow (⤒)	84	\ndowndownarrows (⤓)	84
\bdneararrow (⤓)	83	\ncwleftarrow (⤓)	83	\ndowndownarrows (⤓)	79
\bdnwarrow (⤓)	83	\ncwneararrow (⤓)	83	\ndownfilledspoon (⤓)	93
\bdoverarrow (⤓)	83	\ncwopencirclearrow (⤒)	84	\ndownfootline (⤓)	56
\bdrightarrow (⤓)	83	\ncwoverarrow (⤓)	83	\downfree (⤓)	56
\bdsearrow (⤓)	83	\ncwrightarrow (⤓)	84	\downharpoonccw (⤓)	81
\bdswarrow (⤓)	83	\ncwsearrow (⤓)	84	\downharpooncw (⤓)	81
\bdunderarrow (⤓)	83	\ncwsarrow (⤓)	84	\downharpoonleft (⤓)	85
\blackwhitespoon (⤓)	94	\ncwunderarrow (⤓)	84	\downharpoonright (⤓)	85
\NBSP (⠀)	135	\ndasharrow (⤓)	84	\downlcurvearrow (⤓)	84
\NBSP (⠀)	135	\ndasharrow (⤓)	80	\downleftcurvedarrow (⤓)	84
\nBumpeq (≠)	54	\ndasheddownarrow (⤓)	79	\downlsquigarrow (⤓)	84
\nBumpeq (≠)	59	\ndashedleftarrow (⤓)	79	\downlsquigarrow (⤓)	79
\nBumpeq (≠)	56	\ndashedneararrow (⤓)	79	\downmapsto (⤔)	84
\nBumpeq (≠)	62	\ndashednarrow (⤓)	79	\downmapsto (⤓)	84
\nbumpeq (≠)	54	\ndashedrightarrow (⤓)	79	\downModels (⤔)	56
\nbumpeq (≠)	59	\ndashedsearrow (⤓)	79	\downmodels (⤔)	59
\nbumpeq (≠)	56	\ndashedswarrow (⤓)	79	\downmodels (⤔)	56
\nbumpeq (≠)	62	\ndasheduparrow (⤓)	79	\downpitchfork (⤓)	95
\nbumpeqq (≠)	59	\dashleftarrow (⤓)	84	\downpitchfork (⤓)	93
\ncirceq (≠)	59	\dashleftarrow (⤓)	80	\downrcurvearrow (⤓)	84
\ncirceq (≠)	56	\dashrightarrow (⤓)	84	\downrightcurvedarrow (⤓)	84
\ncleararrowleft (⤒)	84	\dashrightarrow (⤓)	80	\downrsquigarrow (⤓)	84
\ncleararrowleft (⤒)	80	\DashV (⤓)	54	\downrsquigarrow (⤓)	79
\ncleararrowright (⤒)	84	\DashV (⤓)	59	\downspoon (⤓)	94
\ncleararrowright (⤒)	80	\Dashv (⤓)	54	\downspoon (⤓)	93
\ncirmid (⌚)	94	\Dashv (⤓)	59	\downuparrows (⤓)	84
\closedeql (≠)	56	\DashV (⤓)	54	\downuparrows (⤓)	79
\closure (≠)	59, 95	\DashV (⤓)	59	\downupcurvearrow (⤓)	84
\ncong (⌚)	54	\Dashv (⤓)	54	\downupharpoons (⤓)	85
\ncong (⌚)	53	\Dashv (⤓)	59	\downupharpoons (⤓)	81
\ncong (⌚)	60	\Dashv (⤓)	57	\downupharpoonsleftright (⤓)	85
\ncong (⌚)	59	\DashVv (⤓)	54	\downupsquigarrow (⤓)	84
\ncong (⌚)	56	\DashVv (⤓)	59	\downVDash (⤔)	59
\ncong (⌚)	62	\Dashhv (⤓)	59		
\ncongdot (⌚)	62	\Dashhv (⤓)	84		

\ndownVdash (⊤)	59	\neq (≠)	60	\neutron (n^0)	138
\ndownVdash (⊤)	56	\neq (#)	59	\neVdash (⊲)	55
\ndownvDash (⊤)	59	\neq (#)	57	\nevDash (⊲)	55
\downvDash (⊤)	59	\neq (#)	62	new (old-arrows package option)	
\downvDash (⊤)	56	\neqbump (#)	56	92
\downwavearrow (⌚)	84	\neqcirc (#)	59	\newextarrow	117
\ndststile (⊤)	63	\neqcirc (#)	56	\newmetrics	189
\ndtstile (⊤)	63	\neqdot (#)	59	\newmoon (●)	132
\ndttstile (⊤)	63	\neqdot (#)	56	\newmoon (●)	131
\ndualmap (↝)	94	\neqsim (#)	59	\newtie (⊸)	21
\NE (#)	134	\neqsim (#)	56	\exists (♯)	100
\ne	see \neq	\neqsim (⊤)	62	\exists (♯)	100
\ne (#)	59	\neqlantgr (#)	68	\exists (♯)	101
\ne (#)	57	\neqlantgr (#)	70	\exists (♯)	101
\ne (#)	62	\neqlantgr (#)	69	\exists (♯)	101
\Narrow (⤠)	76	\neqlantgr (#)	71	\nfallingdotseq (#)	59
\Narrow (⤠)	86	\neqlantless (#)	68	\nfallingdotseq (#)	57
\Narrow (⤠)	82	\neqlantless (#)	70	\nforksnot (↯)	62
\Narrow (⤠)	77	\neqlantless (#)	69	\nfrown (↑)	59, 95
\Narrow (⤠)	87	\neqlantless (#)	71	\nfrown (↑)	94
\nearrow (⤠)	76	\neqsmile (#)	94	\nfrownneq (#)	59, 95
\nearrow (⤠)	75, 233	\nequal (#)	59	\nfrownneq (ɸ)	94
\nearrow (⤠)	82	\nequal (#)	57	\nfrownneqsmile (#)	94
\nearrow (⤠)	77	\nequalclosed (#)	57	\nfrownsmile (#)	59, 95
\nearrow (⤠)	77	\nequiv (#)	54	\nfrownsmile (ɸ)	94
\nearrow (⤠)	92	\nequiv (≠)	60	\nfrownsmileeq (ɸ)	94
\nearrow (⤠)	88	\nequiv (#)	59	\NG (⊸)	134
\nearrowcorner (⤠)	86	\nequiv (#)	57	\NG (□)	162
\nearrowtail (⤠)	82	\nequiv (#)	62	\NG (□)	15
\nearrowtail (⤠)	77	\nequivclosed (✉)	57	\ng (diamond)	162
\nebkarrow (⤠)	82	\nercurvearrow (⤠)	83	\ng (η)	15
\nefilledspoon (⤠)	93	\nersquigarrow (⤠)	77	\nge (≠)	72
\nefootline (⤠)	55	\nespoon (⤠)	93	\ngeq (≠)	68
\nefree (⤠)	55	\Neswarrow (⤠)	82	\ngeq (≠)	67, 68
\neg (⤠)	124	\Neswarrow (⤠)	77	\ngeq (≠)	71
\neg (⤠)	125	\neswarrow (⤠)	233	\ngeq (≠)	70
\neg (⤠)	125	\neswarrow (⤠)	82	\ngeq (≠)	69
\neg (⤠)	126	\neswarrow (⤠)	77	\ngeq (≠)	71, 72
negation .. see \neg and \sim		\neswarrow (⤠)	88	\ngeqclosed (≠)	70, 74
\neharpoonccw (⤠)	80	\neswarrows (⤠)	82	\ngeqclosed (≠)	69, 73
\neharpooncw (⤠)	80	\neswarrows (⤠)	77	\ngeqd (≠)	70
\neharpoonnw (⤠)	85	\neswbiproto (⤠)	34	\ngeqd (≠)	69
\neharpoonse (⤠)	85	\neswcrossing (⤠)	57	\ngeqq (≠)	68
\nelcurvearrow (⤠)	83	\neswcurvearrow (⤠)	83	\ngeqq (≠)	67
\nelsquigarrow (⤠)	77	\neswharpoonnwse (⤠)	85	\ngeqq (≠)	71
\nemapsto (⤠)	77	\neswharpoonnwse (⤠)	80	\ngeqq (≠)	70
\neModels (⤠)	55	\neswharpoons (⤠)	85	\ngeqq (≠)	69
\nemodels (⤠)	55	\neswharpoons (⤠)	80	\ngeqq (≠)	72
\nenearrows (⤠)	82	\neswharpoonsew (⤠)	85	\ngeqq (≠)	67
\nenearrows (⤠)	77	\neswharpoonsew (⤠)	80	\ngeqlant (≠)	71
\neovnwarrow (⤠)	88	\neswharpoonsew (⤠)	80	\ngeqlant (≠)	71
\neovsearrow (⤠)	88	\Neswline (⤠)	55	\ngeqlant (≠)	70
\nepitchfork (⤠)	93	\neswline (⤠)	55	\ngeqlant (≠)	70
\Neptune (Ψ)	132	\Netherlands (⠄)	194	\ngeqlant (≠)	69
\Neptune (Ψ)	132	neumes	165	\ngeqlant (≠)	72
\Neptune (Ψ)	133	\neuter (♀)	136	\ngeqlantdot (≠)	70
\neptune (ȝ)	131	\Neutral (օ)	136	\ngeqlantdot (≠)	69
\neq (≠)	54	\Neutrey (⊗)	196	\ngeqlcc (≠)	70
\neq (≠)	67	\neutrino (ν)	138	\ngesc (≠)	71

\ngesdot (#)	71	\nhookswarrow (✗)	84	\nleadsto (⤻)	85
\ngesl (%)	71	\nhookuparrow (†)	84	\nleadsto (⤼)	80
\ngets (↔)	84	\nhpar (#)	62	\nLeftarrow (⤲)	76
\ngets (↔)	80	\nHuparrow (‡)	87	\nLeftarrow (⤳)	75
\ngets (↔)	90	\nHuparrow (‡)	90	\nLeftarrow (⤴)	87
\ngg (⤵)	68	\nHVvert (₩)	36	\nLeftarrow (⤵)	83
\ngg (⤶)	70	\ni (ⓘ)	100, 231	\nLeftarrow (⤶)	79
\ngg (⤶)	69	\ni (ⓘ)	58	\nLeftarrow (⤷)	90
\ngg (⤶)	72	\ni (ⓘ)	101	\nleftarrow (⤸)	76
\nggg (⤶⤶)	70	\ni (ⓘ)	100	\nleftarrow (⤸)	75
\nggg (⤶⤶)	69	\ni (ⓘ)	61, 62	\nleftarrow (⤹)	87
\ngtcc (⤶)	70	\nialpha (α)	19	\nleftarrow (⤹)	83
\ngtr (†)	68	\nibar see \ownsbar		\nleftarrow (⤺)	79
\ngtr (†)	67	\nibeta (β)	19	\nleftarrow (⤺)	90
\ngtr (†)	71	\nibLeft (⤸)	141	\nleftarrowtail (⤸)	83
\ngtr (†)	70	\nibRight (⤸)	141	\nleftarrowtail (⤷)	79
\ngtr (†)	69	nibs	141, 142	\nleftAssert (⤪)	59
\ngtr (†)	72	\nibSolidLeft (⤸)	141	\nleftassert (⤪)	59
\ngtrapprox (⤶)	68	\nibSolidRight (⤸)	141	\nleftbkarrow (⤸)	83
\ngtrapprox (⤶)	68	nicefrac (package)	126, 247, 248	\nleftblackspoon (⤶)	94
\ngtrapprox (⤶)	70	niceframe (package)	210–213, 217	\nleftcurvedarrow (⤸)	85
\ngtrcc (⤶)	70	\NiceReapey (⤸)	196	\nleftdowncurvedarrow (⤸)	84
\ngtrclosed (⤶)	70, 74	\nichi (χ)	19	\nleftfilledspoon (⤶)	93
\ngtrclosed (⤶)	69, 73	\niepsilon (ε)	19	\nleftfootline (⤸)	59
\ngtrdot (⤶)	70	\nigamma (γ)	19	\nleftfootline (⤹)	56
\ngtrdot (⤶)	69	\niota (ι)	19	\nleftfree (⤸)	56
\ngtreqless (⤶)	70	\nilambda (λ)	19	\nleftharpoonccw (⤶)	81
\ngtreqless (⤶)	69	\nimageof (⤸)	94	\nleftharpooncw (⤶)	81
\ngtreqlesslant (⤶)	70	\nin (₦)	59, 101	\nleftharpoondown (⤶)	85
\ngtreqlesslant (⤶)	69	\nin (₱)	100	\nleftharpoonup (⤶)	85
\ngtreqqlless (⤶)	70	\Ninja (⤸)	196	\nleftlcurvearrow (⤸)	84
\ngtreqqlless (⤶)	69	\niobar (ܰ)	61	\nleftleftarrows (⤶)	83
\ngtreqslantless (⤶)	70	\niomega (ω)	19	\nleftleftarrows (⤷)	79
\ngtrless (⤶)	68	\niphy (φ)	19	\nleftlsquigarrow (⤸)	84
\ngtrless (⤶)	70	\niplus (⊕)	53	\nleftlsquigarrow (⤷)	79
\ngtrless (⤶)	69	\niplus (⊕)	60	\nLeftmapsto (⤪)	83
\ngtrless (⤶)	72	\nis (ⓘ)	61	\nLeftmapsto (⤪)	83
\ngtrsimeq (⤶)	68	\nisd (϶)	60	\nleftmapsto (⤪)	79
\ngtrsimeq (⤶)	68	\nisd (϶)	61	\nleftModels (⤪)	56
\ngtrsimeq (⤶)	70	\nisigma (σ)	19	\nleftmodels (⤪)	59
\ngtrsimeq (⤶)	72	\nitheta (θ)	19	\nleftpitchfork (⤶)	95
\ngtrsimeq (⤶)	68	\niupsilon (υ)	19	\nleftpitchfork (⤶)	93
\nhateq (#)	59	\niv (⟂)	103	\nleftrcurvearrow (⤸)	84
\nhateq (#)	57	\nj (ڽ)	19	\nLeftrightarrow (⤲)	87
\nHdownarrow (‡)	87	\nkarta (package)	204, 247	\nLeftrightarrow (⤳)	76
\nHdownarrow (‡)	90	\nlcirclearrowdown (⤵)	79	\nLeftrightarrow (⤴)	75
\nhknearrow (✗)	84	\nlcirclearrowleft (⤵)	79	\nLeftrightarrow (⤵)	87
\nhknearrow (☒)	84	\nlcirclearrowright (⤵)	79	\nLeftrightarrow (⤷)	83
\nhksearrow (☒)	84	\nlcirclearrowup (⤵)	79	\nLeftrightarrow (⤷)	79
\nhkswarrow (✗)	84	\nlcurvearrowdown (⤵)	79	\nLeftrightarrow (⤸)	90
\nhookdownarrow (†)	84	\nlcurvearrowleft (⤸)	79	\nLeftrightarrow (⤸)	76
\nhookeleftarrow (⤸)	84	\nlcurvearrowne (⤸)	79	\nLeftrightarrow (⤸)	30, 75
\nhookeleftarrow (⤸)	80	\nlcurvearrownw (⤸)	79	\nLeftrightarrow (⤸)	87
\nhooknearrow (✗)	84	\nlcurvearrowright (⤸)	79	\nLeftrightarrow (⤸)	83
\nhooknarrow (☒)	84	\nlcurvearrowse (⤸)	79	\nLeftrightarrow (⤸)	79
\nhookrightarrow (⤸)	84	\nlcurvearrowsw (⤸)	79	\nLeftrightarrow (⤸)	90
\nhookrightarrow (⤸)	80	\nlcurvearrowup (⤸)	79	\nLeftrightarrows (⤶)	83
\nhooksearrow (☒)	84	\nle (⤵)	72	\nLeftrightarrows (⤶)	79

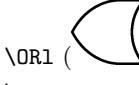
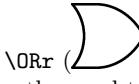
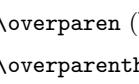
\nleftrightblackspoon (↔)	94
\nleftrightcurvearrow (⤵)	84
\nleftrightharpoondownup (⤶)	85
.....	85
\nleftrightharpoondownup (⤷)	81
.....	81
\nleftrightharpoons (⤸)	85
\nleftrightharpoons (⤹)	81
\nleftrightharpoonupdown (⤸)	85
.....	85
\nleftrightharpoonupdown (⤹)	81
.....	81
\nLeftrightline (⤺)	56
\nleftrightline (⤻)	56
\nleftrightspoon (⤼)	94
\nleftrightsquigarrow (⤶)	84
\nleftrightsquigarrow (⤷)	80
\nleftrightwavearrow (⤶)	83
\nleftrsquigarrow (⤸)	84
\nleftrsquigarrow (⤹)	79
\nleftspoon (⤸)	94
\nleftspoon (⤹)	93
\nleftsquigarrow (⤶)	84
\nleftupcurvedarrow (⤸)	84
\nleftVDash (⤻)	59
\nleftVdash (⤻)	59
\nleftVdash (⤻)	56
\nleftvDash (⤻)	59
\nleftvdash (⤻)	59
\nleftvdash (⤻)	56
\nleftwavearrow (⤶)	83
\nleq (⤸)	68
\nleq (⤹)	67, 68
\nleq (⤻)	71
\nleq (⤻)	70
\nleq (⤻)	69
\nleq (⤻)	72
\nleqclosed (⤻)	70, 74
\nleqclosed (⤻)	69, 73
\nleqdot (⤻)	70
\nleqdot (⤻)	69
\nleqq (⤸)	68
\nleqq (⤹)	67
\nleqq (⤻)	71
\nleqq (⤻)	70
\nleqq (⤻)	69
\nleqq (⤻)	72
\nleqlslant (⤸)	67
\nleqlslant (⤻)	71
\nleqlslant (⤻)	70
\nleqlslant (⤻)	69
\nleqlslant (⤻)	72
\nleqlslantdot (⤻)	70
\nleqlslantdot (⤻)	69
\nleqlslcc (⤻)	70
\nlescc (⤻)	70
\nlesdot (⤻)	70
\nlesg (⤻)	70
\nless (⤸)	68
\nless (⤹)	67
\nless (⤻)	71
\nless (⤻)	70
\nless (⤻)	69
\nless (⤻)	72
\nlessapprox (⤸)	68
\nlessapprox (⤹)	68
\nlessapprox (⤻)	70
\nlesscc (⤻)	70
\nlessclosed (⤻)	70, 74
\nlessclosed (⤻)	69, 73
\nlessdot (⤸)	70
\nlessdot (⤻)	69
\nlesseqgtr (⤸)	70
\nlesseqgtr (⤹)	69
\nlesseqgrslant (⤸)	71
\nlesseqgrslant (⤹)	69
\nlesseqgtr (⤻)	70
\nlesseqgtr (⤻)	69
\nlesseqgtr (⤻)	71
\nlesseqslantgtr (⤸)	70
\nlessgtr (⤸)	68
\nlessgtr (⤻)	70
\nlessgtr (⤻)	69
\nlessgtr (⤻)	72
\nlesssim (⤸)	68
\nlesssim (⤻)	68
\nlesssim (⤻)	70
\nlesssim (⤻)	72
\nlhookdownarrow (⤸)	79
\nlhookleftarrow (⤶)	80
\nlhooknearrow (⤸)	80
\nlhooknwarrow (⤸)	79
\nlhookrightarrow (⤶)	79
\nlhooksearrow (⤸)	79
\nlhookswarrow (⤸)	79
\nlhookuparrow (⤸)	79
\nll (⤸)	68
\nll (⤹)	70
\nll (⤻)	69
\nll (⤻)	72
\nLleftarrow (⤺)	83
\nLleftarrow (⤻)	79
\nlll (⤸)	70
\nlll (⤹)	69
\nlongdashv (⤶)	59
\nlongleadsto (⤶)	84
\nLongleftarrow (⤺)	83
\nlongleftarrow (⤻)	83
\nlongleftfootline (⤶)	59
\nLongleftrightarrow (⤺)	83
\nlongleftrightarrow (⤻)	83
\nlongleftsquigarrow (⤶)	84
\nlongleftwavearrow (⤶)	83
\nLongmapsfrom (⤺)	59, 83
\nlongmapsfrom (⤻)	59, 83
\nlongmapsto (⤺)	83
\nlongmapsto (⤻)	84
\nlongrightarrow (⤺)	83
\nlongrightarrow (⤻)	83
\nlongrightfootline (⤶)	59
\nlongrightsquigarrow (⤶)	84
\nlongrightwavearrow (⤶)	83
\nltcc (⤻)	71
\nMapsdown (⤸)	84
\nmapsdown (⤻)	84
\nMapsfrom (⤺)	84
\nmapsfrom (⤻)	84
\nMapsto (⤺)	84
\nmapsto (⤺)	84
\nmapsto (⤻)	80
\nMapsup (⤸)	84
\nmapsup (⤻)	84
\nmid (⤻)	53
\nmid (⤻)	60
\nmid (⤻)	59
\nmid (⤻)	57
\nmid (⤻)	62
\nmidcir (⤻)	94
\nmodels (⤻)	59
\nmodels (⤻)	57
\nmultimap (⤼)	94
\nmultimap (⤼)	93
\nmultimapinv (⤸)	94
\NN (⤻)	134
\ndntstile (⤻)	63
\nNarrow (⤸)	83
\nNarrow (⤸)	79
\nnearrow (⤻)	76
\nnearrow (⤻)	86
\nnearrow (⤻)	83
\nnearrow (⤻)	79
\nnearrowtail (⤸)	83
\nnearrowtail (⤸)	79
\nnebkarrow (⤻)	84
\nnefilledspoon (⤸)	93
\nnefootline (⤸)	56
\nnefree (⤸)	56
\nneharpoonccw (⤸)	81
\nneharpooncw (⤸)	81
\nneharpoontw (⤸)	85
\nneharpoonse (⤸)	85
\nnecurvearrow (⤸)	84
\nnelsquigarrow (⤸)	79
\nnemapsto (⤸)	79
\nneModels (⤸)	56
\nnemodels (⤸)	56
\nnenearrows (⤸)	84
\nnenearrows (⤸)	79
\nnepitchfork (⤸)	93
\nnercurvearrow (⤸)	84
\nnersquigarrow (⤸)	79
\nnespoon (⤸)	93
\nnesarrow (⤸)	84

\nrcurvearrowleft (⌚)	79	\nrightmapsto (⤠)	79	\nseVdash (⩵)	56
\nrcurvearrowne (⌚)	79	\nrightModels (⤤)	57	\nsevDash (⩵)	56
\nrcurvearrownw (⌚)	79	\nrightmodels (⤤)	59	\nshortdowntack (⤥)	59
\nrcurvearrowright (⌚)	79	\nrightmodels (⤤)	57	\nshortlefttack (⤦)	59
\nrcurvearrowse (⌚)	79	\nrightpitchfork (⤧)	95	\nshortmid (⤧)	53
\nrcurvearrowsw (⌚)	79	\nrightpitchfork (⤧)	93	\nshortmid (⤧)	60
\nrcurvearrowup (⌚)	79	\nrightrcurvearrow (⌚)	84	\nshortmid (⤧)	59
\nRelbar (=)	57	\nrightrightarrows (⤧)	84	\nshortmid (⤧)	56
\nrelbar (+)	57	\nrightrightarrows (⤧)	79	\nshortmid (⤧)	62
\nrestriction (⤤)	85	\nrightrsquigarrow (⤧)	84	\nshortparallel (⤨)	53
\nrestriction (⤤)	81	\nrightrsquigarrow (⤧)	79	\nshortparallel (⤨)	60
\nrhookdownarrow (⤧)	79	\nrightspoon (⤧)	94	\nshortparallel (⤨)	59
\nrhookleftarrow (⤧)	79	\nrightspoon (⤧)	93	\nshortparallel (⤨)	56
\nrhooknearrow (⤧)	79	\nrightsquigarrow (⤧)	84	\nshortparallel (⤨)	62
\nrhooknarrow (⤧)	79	\nrightsquigarrow (⤧)	80	\nshortrighttack (⤦)	59
\nrhookrightarrow (⤧)	79	\nrightupcurvedarrow (⤧)	84	\nshortuptack (⤧)	59
\nrhooksearrow (⤧)	79	\nrightVDash (⤤)	59	\nsim (⤧)	54
\nrhookswarrow (⤧)	79	\nrightVdash (⤤)	59	\nsim (⤧)	53
\nrhookuparrow (⤧)	79	\nrightVdash (⤤)	57	\nsim (⤧)	60
\nRightarrow (⤧)	76	\nrightvDash (⤤)	59	\nsim (⤧)	59
\nRightarrow (⤧)	75	\nrightvdash (⤦)	59	\nsim (⤧)	56
\nRightarrow (⤧)	87	\nrightvdash (⤦)	57	\nsim (⤧)	62
\nRightarrow (⤧)	84	\nrightwavearrow (⤧)	84	\nsime (⤧)	59
\nRightarrow (⤧)	80	\nrisingdotseq (⤤)	59	\nsime (⤧)	62
\nRightarrow (⤧)	90	\nrisingdotseq (⤤)	56	\nsimeq (⤧)	54
\nrightarrow (⤧)	76	\nRightarrow (⤧)	83	\nsimeq (⤧)	54
\nrightarrow (⤧)	75	\nRightarrow (⤧)	79	\nsimeq (⤧)	59
\nrightarrow (⤧)	87	\nsdtstile (⤧)	63	\nsimeq (⤧)	56
\nrightarrow (⤧)	84	\nSearrow (⤧)	83	\nsimeq (⤧)	62
\nrightarrow (⤧)	79	\nSearrow (⤧)	79	\nsmile (⤧)	59, 95
\nrightarrow (⤧)	90	\nsearrow (⤧)	83	\nsmile (⤧)	94
\nrightarrowtail (⤧)	84	\nsearrow (⤧)	79	\nsmileeq (⤧)	59, 95
\nrightarrowtail (⤧)	80	\nsearrowtail (⤧)	83	\nsmileeq (⤧)	94
\nrightAssert (⤤)	59	\nsearrowtail (⤧)	79	\nsmilefrown (⤧)	59, 95
\nrightassert (⤤)	59	\nsearrowtail (⤧)	83	\nsmilefrown (⤧)	94
\nrightbkarw (⤧)	84	\nsefilledspoon (⤧)	93	\nsmilefrown (⤧)	94
\nrightblackspoon (⤧)	94	\nsefootline (⤧)	56	\nsmilefrowneq (⤧)	94
\nrightcurvedarrow (⤧)	84	\nsefree (⤧)	56	\nsmilefrowneq (⤧)	94
\nrightdowncurvedarrow (⤧)	84	\nseharpoonccw (⤧)	81	\nsmiledouble (⤧)	94
		\nseharpooncw (⤧)	81	\nsmiledouble (⤧)	94
\nrightfilledspoon (⤧)	93	\nseharpoonne (⤧)	85	\nsmeqfrown (⤧)	94
\nrightfootline (⤧)	59	\nseharpoonsw (⤧)	85	\nsmeqsmile (⤧)	94
\nrightfootline (⤧)	57	\nsecurvearrow (⤧)	84	\nsmfrown (⤧)	94
\nrightfree (⤧)	57	\nsecurvearrow (⤧)	79	\nsmfrowneq (⤧)	94
\nightharpoonccw (⤧)	81	\nsecurvearrow (⤧)	79	\nsmfrowneqsmile (⤧)	94
\nightharpooncw (⤧)	81	\nsemapsto (⤧)	79	\nsmfrownsmile (⤧)	94
\nightharpoondown (⤧)	85	\nseModels (⠃)	56	\nsmfrownsmile (⤧)	94
\nightharpoonup (⤧)	85	\nsemodels (⠃)	56	\nsmfrownsmile (⤧)	94
\nrightlcurvearrow (⤧)	84	\nsearrowrows (⤧)	83	\nsmfrownsmile (⤧)	94
\nrightleftarrows (⤧)	84	\nsearrowrows (⤧)	79	\nsmfrowneqfrown (⤧)	94
\nrightleftarrows (⤧)	79	\nsecurvearrow (⤧)	84	\nsmfrowneqfrown (⤧)	94
\nrightleftcurvearrow (⤧)	84	\nsewharpoons (⤧)	85	\nsmfrowneqfrown (⤧)	94
\nrightleftharpoons (⤧)	85	\nsewharpoons (⤧)	81	\nsmfrowneqfrown (⤧)	66
\nrightleftharpoons (⤧)	81	\nsepitchfork (⤧)	93	\nsmfrowneqfrown (⤧)	66
\nrightleftsquigarrow (⤧)	84	\nsecurvearrow (⤧)	84	\nsmfrowneqfrown (⤧)	65
\nrightlsquigarrow (⤧)	84	\nserpoons (⤧)	79	\nsmfrowneqfrown (⤧)	65
\nrightlsquigarrow (⤧)	79	\nsearrows (⤧)	83	\nsmfrowneqfrown (⤧)	66
\nRightmapsto (⤧)	84	\nsearrows (⤧)	79	\nsmfrowneqfrown (⤧)	66
\nrightmapsto (⤧)	84	\nsepoon (⤧)	93	\nsmfrowneqfrown (⤧)	67

\nsqsubseteqq (⊉)	65	\nsubseteqq (⊈)	67	\nswfree (⊤)	56
\nsqsubseteqq (⊏)	65	\nsucc (⊤)	54	\nsharpoonccw (⊤)	81
\nsqsubseteqq (⊐)	66	\nsucc (⊤)	53	\nsharpooncw (⊤)	81
\nsqsubseteqq (⊑)	66	\nsucc (⊤)	60	\nsharpoonnw (⊤)	85
\nsqsubseteqq (⊒)	67	\nsucc (⊤)	59	\nsharpoonse (⊤)	85
\nsqsubseteqq (⊔)	65	\nsucc (⊤)	56	\nswlcurvearrow (⊤)	84
\nsqsubseteqq (⊕)	66	\nsucc (⊤)	62	\nswlsquigarrow (⊤)	79
\nsqsubseteqq (⊖)	66	\nsuccapprox (⊤)	54	\nswmapsto (⊤)	79
\nSqsupset (⊢)	66	\nsuccapprox (⊤)	54	\nswModels (⊸)	56
\nSqsupset (⊢)	66	\nsuccapprox (⊤)	59	\nswmodels (⊸)	56
\nsqSupset (⊢)	65	\nsuccapprox (⊤)	56	\nswnearrows (⊸)	83
\nsqSupset (⊢)	65	\nsucccurlyeq (⊤)	54	\nswnearrows (⊸)	79
\nsqSupset (⊢)	65	\nsucccurlyeq (⊤)	54	\nswnecurvearrow (⊤)	84
\nsqSupset (⊢)	65	\nsucccurlyeq (⊤)	59	\nswneharpoons (⊸)	85
\nsqSupset (⊢)	66	\nsucccurlyeq (⊤)	56	\nswneharpoons (⊸)	81
\nsqSupset (⊢)	67	\nsucccurlyeq (⊤)	62	\nswpitchfork (⊸)	93
\nsqSupseteq (⊢)	65	\nsucceq (⊤)	54	\nswrcurvearrow (⊤)	84
\nsqSupseteq (⊢)	65	\nsucceq (⊤)	53	\nswrsquigarrow (⊤)	79
\nsqSupseteq (⊢)	66	\nsucceq (⊤)	60	\nswspoon (⊤)	93
\nsqSupseteq (⊢)	66	\nsucceq (⊤)	59	\nswswallows (⊸)	83
\nsqSupseteq (⊢)	67	\nsucceq (⊤)	56	\nswswallows (⊸)	79
\nsqSupseteqq (⊢)	65	\nsucceq (⊤)	62	\nswVdash (⊸)	56
\nsqSupseteqq (⊢)	66	\nsucceqq (⊤)	54	\nswvDash (⊸)	56
\nsqSupseteqq (⊢)	66	\nsucceqq (⊤)	59	\NT (⊸)	134
\nsqtriplefrown (⊸)	94	\nsuccsim (⊤)	54	\ntdtstile (⊸)	63
\nsqtriplesmile (⊸)	94	\nsuccsim (⊤)	54	ntheorem (package)	124
\nsquigarrowdownup (⊸)	79	\nsuccsim (⊤)	59	\nthickapprox (⊸)	54
\nsquigarrowleftright (⊸)	79	\nsuccsim (⊤)	56	\npto (⊸)	84
\nsquigarrowownesw (⊸)	79	\nSupset (⊢)	65	\npto (⊸)	80
\nsquigarrowownwse (⊸)	79	\nSupset (⊢)	65	\ntriangleeq (⊐)	74
\nsquigarrowrightleft (⊸)	79	\nSupset (⊢)	66	\ntriangleeq (⊑)	73
\nsquigarrowsenw (⊸)	79	\nSupset (⊢)	66	\ntriangleleft (⊠)	73
\nsquigarrowswne (⊸)	79	\nSupset (⊢)	65	\ntriangleleft (⊡)	72
\nsquigarrowupdown (⊸)	79	\nSupset (⊢)	66	\ntriangleleft (⊢)	74
\nsststile (⊸)	63	\nSupset (⊢)	66	\ntriangleleft (⊣)	74
\nstareq (⊐)	59	\nSupset (⊢)	66	\ntriangleleft (⊤)	69, 73
\nststile (⊸)	63	\nSupset (⊢)	67	\ntrianglelefteq (⊠)	73
\nsttstile (⊸)	63	\nSupseteq (⊢)	65	\ntrianglelefteq (⊡)	72
\nSubset (⊐)	65	\nSupseteq (⊢)	65	\ntrianglelefteq (⊢)	74
\nSubset (⊐)	65	\nSupseteq (⊢)	66	\ntrianglelefteq (⊣)	74
\nSubset (⊐)	66	\nSupseteq (⊢)	66	\ntrianglelefteq (⊤)	69, 73
\nSubset (⊐)	66	\nSupseteq (⊢)	66	\ntrianglelefteq (⊤)	74
\nsubset (⊠)	65	\nSupseteq (⊢)	67	\ntrianglelefteqslant (⊢)	72
\nsubset (⊠)	66	\nSupseteqq (⊢)	65	\ntriangleright (⊠)	73
\nsubset (⊠)	66	\nSupseteqq (⊢)	65	\ntriangleright (⊡)	72
\nsubset (⊠)	66	\nSupseteqq (⊢)	66	\ntriangleright (⊢)	74
\nsubset (⊠)	67	\nSupseteqq (⊢)	66	\ntriangleright (⊣)	74
\nsubseteqq (⊢)	65	\nSupseteqq (⊢)	66	\ntriangleright (⊤)	69, 73
\nsubseteqq (⊢)	66	\nSupseteqq (⊢)	66	\ntriangleright (⊤)	73
\nsubseteqq (⊢)	65	\nSupseteqq (⊢)	67	\ntrianglerighteq (⊢)	73
\nsubseteqq (⊢)	66	\nSwarrow (⊤)	83	\ntrianglerighteq (⊢)	72
\nsubseteqq (⊢)	66	\nSwarrow (⊤)	79	\ntrianglerighteq (⊤)	74
\nsubseteqq (⊢)	66	\nswarrow (⊤)	83	\ntrianglerighteq (⊤)	74
\nsubseteqq (⊢)	67	\nswarrow (⊤)	79	\ntrianglerighteq (⊤)	69, 73
\nsubseteqq (⊢)	65	\nswarrowtail (⊤)	83	\ntrianglerighteq (⊤)	74
\nsubseteqq (⊢)	65	\nswarrowtail (⊤)	79	\ntrianglerighteqslant (⊢)	72
\nsubseteqq (⊢)	66	\nswbkarroW (⊤)	83	\ntriplesim (⊐)	94
\nsubseteqq (⊢)	66	\nswfilledspoon (⊤)	93	\ntriplesim (⊑)	59
\nsubseteqq (⊢)	66	\nswfootline (⊤)	56	\ntriplesim (⊒)	56

\ntriplesmile (⌘)	94	\nupdownarrow (⤳)	83	\nvargeq (≠)	68
\ntststile (☰)	63	\nupdownarrow (⤳)	79	\nvarhookdownarrow (⤳)	84
\nttstile (☰)	63	\nupdownarrows (⤳)	83	\nvarhookleftarrow (⤲)	84
\ntttstile (☰☰)	63	\nupdownarrows (⤳)	79	\nvarhooknearrow (⤴)	84
\ntwoheaddownarrow (⤳)	83	\nupdowncurvearrow (⤳)	84	\nvarhooknarrow (⤵)	84
\ntwoheaddownarrow (⤳)	79	\nupdownharpoonleftright (⤳)	85	\nvarhookrightarrow (⤶)	84
\ntwoheadleftarrow (⤲)	54	\nupdownharpoonleftright (⤳)	81	\nvarhooksearrow (⤷)	84
\ntwoheadleftarrow (⤲)	83	\nupdownharpoonrightleft (⤳)	85	\nvarhookswarrow (⤸)	84
\ntwoheadleftarrow (⤲)	79	\nupdownharpoonrightleft (⤳)	85	\nvarhookuparrow (⤳)	84
\ntwoheadnearrow (⤴)	83	\nupdownharpoonrightleft (⤳)	81	\nvarisobar (⤿)	62
\ntwoheadnearrow (⤴)	79	\nupdownharpoons (⤳)	85	\nvarleftrightwavearrow (⤲)	84
\ntwoheadnarrow (⤴)	83	\nupdownharpoons (⤳)	81	\nvarleftwavearrow (⤲)	84
\ntwoheadnarrow (⤴)	79	\nupdownharpoonsleftright (⤳)	85	\nvarleq (≤)	68
\ntwoheadnarrow (⤴)	83	\nUpdownline (⤳)	56	\nvarniobar (⤿)	62
\ntwoheadnarrow (⤴)	79	\nupdownline (⤳)	56	\nvarparallel (⤳)	54
\ntwoheadrightarrow (⤶)	54	\nupdownsquigarrow (⤳)	84	\nvarparallelinv (⤳)	54
\ntwoheadrightarrow (⤶)	83	\nupdownwavearrow (⤳)	84	\nvarrightwavearrow (⤶)	84
\ntwoheadrightarrow (⤶)	79	\nupfilledspoon (⤳)	93	\nvartriangleleft (⤴)	74
\ntwoheadsearrow (⤷)	83	\nupfootline (⤳)	56	\nvartriangleright (⤶)	74
\ntwoheadsearrow (⤷)	79	\nupfree (⤳)	56	\nvarupdownwavearrow (⤳)	84
\ntwoheadsarrow (⤷)	83	\nupharpoonccw (⤳)	81	\nvarupwavearrow (⤳)	84
\ntwoheadsarrow (⤷)	79	\nupharpooncw (⤳)	81	\nVbar (܂)	59
\ntwoheaduparrow (⤳)	83	\nupharpoonleft (⤳)	85	\nvBar (܂)	59
\ntwoheaduparrow (⤳)	79	\nupharpoonright (⤳)	85	\nVDash (܂)	54
\Nu (N)	97	\nuplcurvearrow (⤳)	84	\nVDash (܂)	53
\nu (ν)	97	\nupleftcurvedarrow (⤷)	84	\nVDash (܂)	60
nuclear power plant	see \SNPP	\nuplsquigarrow (⤳)	84	\nVDash (܂)	59
\nucleus (܂)	138	\nuplsquigarrow (⤳)	79	\nVDash (܂)	57
\Nudelholz (܂܂)	196	\nUpmapsto (⤳)	84	\nVDash (܂)	62
\NUL (܂܂)	135	\nupmapsto (⤳)	84	\nVdash (܂)	54
\NUL (܂܂)	135	\nupmapsto (⤳)	79	\nVdash (܂)	57
null infinity	see alphabets, math	\nupModels (܂)	56	\nVdash (܂)	62
null set	123–125	\nupmodels (܂)	59	\nvDash (܂)	54
number sets	see alphabets, math	\nupmodels (܂)	57	\nvDash (܂)	53
number sign	see \textnumero	\nuppitchfork (⤳)	95	\nvDash (܂)	60
numbers	see numerals	\nuppitchfork (⤳)	93	\nvDash (⤳)	59
numerals	28, 122, 130, 144, 179,	\nuprcurvearrow (⤳)	84	\nvDash (⤳)	57
	187, 188, 204–206, 224	\nuprightcurvearrow (⤳)	84	\nvDash (⤳)	62
circled	144, 187, 188, 224	\nuprsquigarrow (⤳)	85	\nvDash (⤳)	54
Epi-Olmec	161	\nuprsquigarrow (⤳)	79	\nvDash (⤳)	53
Isthmian	161	\nupspoon (⤳)	94	\nvDash (⤳)	60
LCD	130	\nupspoon (⤳)	93	\nvDash (⤳)	59
Linear B	157	\nupuparrows (⤳)	84	\nvDash (⤳)	59
Mayan	122	\nupuparrows (⤳)	80	\nvDash (⤳)	62
old-style	28	\nupVDash (܂)	59	\nvDash (⤳)	59
segmented	130	\nupVdash (܂)	59	\nvDash (⤳)	57
\NumLock (܂܂)	134	\nupVdash (܂)	59	\nvDash (⤳)	53
\nUparrow (⤳)	83	\nupVdash (܂)	59	\nvDash (⤳)	60
\nUparrow (⤳)	79	\nupVdash (܂)	59	\nvDash (⤳)	59
\nuparrow (⤳)	83	\nupVdash (܂)	59	\nvDash (⤳)	57
\nuparrow (⤳)	79	\nupVdash (܂)	57	\nvDash (⤳)	62
\nuparrowtail (⤳)	83	\nupvDash (܂)	59	\nvDash (⤳)	59
\nuparrowtail (⤳)	79	\nupvDash (܂)	59	\nvDash (⤳)	59
\nupAssert (܂)	59	\nupvDash (܂)	57	\nvDash (⤳)	59
\nupassert (܂)	59	\nupvDash (܂)	57	\nvDash (⤳)	57
\nupbkarrow (⤳)	83	\nupwavearrow (⤳)	84	\nvDash (⤳)	62
\nupblackspoon (⤳)	94	\Nursey (܂)	196	\nvDash (⤳)	59
\nUpdownarrow (⤳)	83	\nuup (ݒ)	98	\nvDash (⤳)	59
\nUpdownarrow (⤳)	79	\nUparrow (⤳)	84	\nvDash (⤳)	59
		\nvardownwavearrow (⤳)	84	\nvDash (⤳)	90

\nvleftrightarrow (↔)	90	\nwsearrow (↖)	233	\Octosteel (●)	136
\nvlongdash (↔—)	59	\nwsearrow (↘)	82	\od (ゑ)	23
\nVrightarrow (⤠)	87	\nwsearrow (⤡)	77	\odash (⊖)	39
\nVrightarrow (⤠)	90	\nwsearrow (⤢)	88	\odiv (÷)	37
\nvRightarrow (⤠)	90	\nwsearrows (⤣)	82	\odiv (⊕)	40
\nvrightarrow (⤠)	90	\nwsearrows (⤤)	77	\odot (⊙)	37
\nVrightarrowtail (⤠⤠)	90	\nwsebiproto (⤥)	34	\odot (○)	31
\nvrightarrowtail (⤠⤠)	90	\nwsecrossing (⤦)	55	\odot (◐)	39
\nVtwoheadleftarrow (⤠⤠⤠)	90	\nwsecurvearrow (⤧)	83	\odot (◎)	38
\nvtwoheadleftarrow (⤠⤠⤠)	90	\nwseharpoonnesw (⤨)	85	\odot (○)	40
\nVtwoheadleftarrowtail (⤠⤠⤠⤠)	90	\nwseharpoonnesw (⤨)	80	\odotslashdot (⊗)	40
\nvtwoheadleftarrowtail (⤠⤠⤠⤠)	90	\nwseharpoons (⤩)	85	\odplus (⊕)	37
\nVtwoheadleftarrowtail (⤠⤠⤠⤠)	90	\nwseharpoons (⤩)	80	\OE (Œ)	15, 244
\nVtwoheadrightarrow (⤠⤠⤠⤠)	90	\nwseharpoonswne (⤪)	85	\oe (œ)	15, 244
\nvtwoheadrightarrow (⤠⤠⤠⤠)	90	\nwseharpoonswne (⤪)	80	\oequal (⊖)	39
\nVtwoheadrightarrowtail (⤠⤠⤠⤠⤠)	90	\Nwsepline (⤩⤩)	55	\Ofen (☲)	196
\nvtwoheadrightarrowtail (⤠⤠⤠⤠⤠)	90	\nwseline (⤨)	55	\offinterlineskip	231
\nVtwoheadrightarrowtail (⤠⤠⤠⤠⤠)	90	\nwspoon (⤨)	93	ogonek (package)	24, 247, 248
\nVvash (⤠⤠⤠⤠⤠)	90	\nwvdash (⤧)	55	ogonek (ゑ)	see accents
\nVvash (⤠⤠⤠⤠⤠)	90	\nwvdash (⤧)	55	\ogreaterthan (⊗)	32
\nVvdash (⤠⤠⤠⤠⤠)	90			\ogreaterthan (⊖)	39
\Nwarrow (⤩⤩)	76	O		\ogreaterthan (⊗)	40
\Nwarrow (⤩⤩)	86	\o (ø)	15	\ohill (⤩)	23
\Nwarrow (⤩⤩)	82	o (o)	97	ohm see \textohm	
\Nwarrow (⤩⤩)	77	o (ꝑ)	162	\ohm (Ω)	130
\Nwarrow (⤩⤩)	88	\oast (⊗)	38	\Ohne (⤩)	165
\narrow (⤨)	76	\oast (⊗)	38	\OHORN (ଓ)	16
\narrow (⤨)	75, 233	\oasterisk (⊗)	37	\ohorn (σ)	16
\narrow (⤨)	82	\obackslash (⊗)	37	\oiint (⨍⨍)	44
\narrow (⤨)	77	\obackslash (⊗)	38	\oiint (⨍⨍)	47
\narrow (⤨)	92	\obackslash (⊗)	38	\oiint (⨍⨍)	51
\narrow (⤨)	88	\obar (◑)	32	\oiint (⨍⨍)	48
\narrowcorner (⤩⤩)	86	\obar (◑)	39	\oiintclockwise (⨍⨍)	44
\narrowtail (⤨)	82	\obar (◑)	40	\oiintcclockwise (⨍⨍)	44
\narrowtail (⤨)	82	\obelus (—)	188	\oiintsl (⨍)	50
\nwbkarrown (⤨)	82	\obelus (—)	188	\oiintup (⨍)	50
\nwedgeq (≠)	59	\obelus* (⤵)	188	\oint (∮)	44
\nwfilledspoon (⤨)	93	\obelus* (⤵)	188	\oint (∮)	43
\nwfootline (⤨)	55	\oblong (□)	32	\oint (∮)	45
\nwfree (⤨)	55	\oblong (□)	39	\oint (∮)	45
\nwharpoonccw (⤨)	80	\obot (⊕)	37	\oint (∮)	45
\nwharpooncw (⤨)	80	\obot (⊕)	39	\oint (∮)	47
\nwharpoonne (⤨)	85	\obot (⊕)	40	\oint (∮)	51
\nwharpoonsw (⤨)	85	\obrbrak (—)	126	\oint (∮)	46
\nwhiteblackspoon (⤨⤠)	94	\obslash (⊗)	32	\oint (∮)	48
\nwlcurvearrow (⤧)	83	\obslash (⊗)	39	\oiintclockwise (⨍)	45
\nwlsquigarrow (⤨)	77	\obslash (⊗)	39	\oiintcclockwise (⨍)	45
\nwmapsto (⤨)	77	\obslash (⊗)	40	\oiintctrlclockwise (⨍)	45
\nwModels (⤩)	55	\oc ()	30	\ointctrlclockwise (⨍)	50
\nwmodels (⤩)	55	\ocirc (◎)	37	\ointsl (∮)	50
\nwnnwarrows (⤩⤩)	82	\ocirc (◎)	38	\ointup (∮)	50
\nwnnwarrows (⤩⤩)	77	\ocirc (◎)	38	\oint (∮)	44
\nwvnearrow (⤨⤩)	88	\ocircle (○)	32	\oint (∮)	43
\wpitchfork (⤨)	93	\ocoasterisk (⊗)	37	\oint (∮)	43
\nwrcurvearrow (⤧)	83	\ocommatopright (⤩)	111	\oint (∮)	42
\nrsquigarrow (⤨)	77	\octagon (○)	146	\oint (∮)	47
\Nwsearrow (⤩⤩)	82	octonions (ଓ) . . . see alphabets,		\oint (∮)	46
\Nwsearrow (⤩⤩)	77	math		\oint (∮)	48

\ointclockwise (⌚)	44
\ointclockwise (⌚)	45
\ointclockwise (⌚)	48
\ointclockwise (⌚)	51
\ointctrcclockwise (⌚)	44
\ointctrcclockwise (⌚)	45
\ointctrcclockwise (⌚)	48
\ointctrcclockwise (⌚)	51
\ointctrcclockwise (⌚)	48
\ointctrcclockwisesl (⌚)	50
\ointctrcclockwiseup (⌚)	50
\ointsI (⌚)	50
\ointup (⌚)	50
\olcross (⊗)	40
old-arrows (package)	92, 247
old-style numerals	28
\oldDWinkey (⌚)	197
	165
\oldstylenums	28
\oldWinkey (⌚)	196
\oleft (⊕)	37
\oleft (⊕)	39
\olessthan (⊗)	32
\olessthan (⊗)	39
\olessthan (⊗)	40
Olschok, Marc	229
\OM (ω)	134
\Omega (Ω)	97
\omega (ω)	97
\omegaap (ω)	98
\Omicron (O)	97
\omicron (o)	97
\ominus (⊖)	37
\ominus (⊖)	31
\ominus (⊖)	39
\ominus (⊖)	39
\ominus (⊖)	38
\ominus (⊖)	40
\onlymove (□)	186
\oo (oo)	188
\oo (oo)	19
\oalign	231
\open (.)	25
open unit disk (\mathbb{D})	see alphabets, math
\openJoin (×)	53
\openo (⌚)	20
\openo (⌚)	19
\openo (⌚)	20
\opentimes (×)	53
OpenType	163
operators	30–33, 37, 38
binary	31–40
logical	see logical operators
set	see set operators
unary	30
\operp (⊕)	40
\oplus (⊕)	37
\oplus (⊕)	30, 31, 229
\oplus (⊕)	39
\oplus (⊕)	38
\oplus (⊕)	38
\oplus (⊕)	40
\opluslhrim (⌚)	36
\oplusrhrim (⌚)	36
\opposbishops (■)	186
\Opposition (♂)	133
\opposition (♂)	131
optical scaling	236
options	see package options
\OR (V)	134
or	see \vee
OR gates	135
\orbit (⌚)	138
	135
\ORd (⌚)	135
\right (⊕)	37
\right (⊕)	39
\origof (↔)	94
\origof (↔)	61
oriscus	see musixgre
	135
\Orl (⌚)	135
\OrnamentDiamondSolid (❖)	152
ornaments	145, 146, 152, 209–211, 213–217
	135
orthogonal to	see \bot
	135
\oslash (⊗)	37
\oslash (⊗)	31
\oslash (⊗)	39
\oslash (⊗)	38
\oslash (⊗)	38
\oslash (⊗)	40
\ostar (⊗)	38
\osum (Σ)	47, 48
.otf files	163
\otimes (⊗)	40
\otimes (⊗)	37
\otimes (⊗)	31
\otimes (⊗)	39
\otimes (⊗)	38
\otimes (⊗)	38
\otimes (⊗)	40
\otimeshat (⊗)	40
\otimeslhrim (⊗)	36
\otimesrhrim (⊗)	36
\otop (⊕)	37
\otriangle (⊗)	39
\otriangle (⊗)	38, 73
\otriangleup (⊕)	37
\oturnedcomma (‘)	111
outer joins	126
ovals	150, 173–178, 204–206, 210–211, 222
\ovee (⊗)	32
\ovee (⊗)	39
\Oven (■)	196
\oven (■)	196
\overarc (□)	24
\overbrace (■)	114
\overbrace (■)	113
\overbrace (■)	113
\overbrace (■)	114
\overbrace (■)	114
\overbrace (■)	112
\overbracket (■)	114
\overbracket (■)	114
\overbracket (■)	235, 236
\overbridge (■)	23
\overgroup (■)	114
\overgroup (□)	113
\overgroup (■)	113
\overleftarrow (■)	114
\overleftarrow (■)	92, 112
\overleftharp (■)	91
\overleftharpdown (■)	91
\overleftharpoon (■)	113
\overleftharpoon (■)	113
\overleftharpoon (■)	114
\overleftrightarrow (■)	114
\overleftrightarrow (■)	92, 113
\overleftswishingghost (⌚)	118
\overleftwitchonbroom (⌚)	118
\overleftwitchonbroom* (⌚)	118
\overline (■)	30, 110, 112
\overlinesegment (■)	113
\overlinesegment (■)	113
	114
\overparenthesis (□)	235, 236
\overrightarrow (■)	112
overrightarrow (package)	112, 247
\overrightarrow (■)	114
\overrightarrow (■)	92, 112
\overrightharp (■)	91

fge	. 91, 102, 111, 122, 126, 247, 248	steinmetz 131, 247, 248
fixmath 241	stix 36, 40, 41, 48, 50, 61, 62, 67, 71, 72, 74, 87, 89–91, 96, 99–101, 103, 107, 111, 114, 120, 122, 123, 126, 132, 134, 136, 148, 149, 151, 163, 184, 247, 248
fontawesome 26, 27, 132, 136, 140–142, 144, 146, 151, 199, 202, 247, 248	stmaryrd 32, 42, 53, 65, 72, 76, 92, 95, 102, 104, 227, 231, 246, 247
fontenc	. 12, 15, 17, 21, 242, 244	svrsymbols 137, 247, 248
fontspec 163, 245, 246	t4phonet 20, 24, 247
fourier	. 27, 64, 98, 102, 109, 115, 142, 146, 182, 247	teubner 27, 121, 159, 189, 247, 248
frege 121, 247, 248	textcomp	. 12, 14, 15, 21, 25–28, 75, 110, 126, 130, 163, 181, 226, 242, 244, 247
gensymb 130	textgreek 16, 98, 247, 248
go 188, 247	tfrupee 27, 247, 248
graphics 91, 229	TikZ 196–198, 203
graphicx 24, 226, 229	tikzsymbols 196, 197, 247, 248
greenpoint 204, 247	timing 130
halloweenmath	. 40, 118, 247, 248	tipa 17, 18, 20, 21, 23, 24, 229, 247
hands 204, 247	tipx 18, 247
harmony 165, 247	trfsigns 64, 101, 118, 247
harpoon 91, 247, 248	trsym 64, 247
hhcount 184, 185, 247, 248	turnstile 63, 247, 248
hieroglif 154, 247	txfonts 30, 32, 44, 53, 54, 65, 68, 76, 95, 98–100, 124, 128, 151, 226, 228, 242, 247
holtpolt 119, 247	type1cm 226
ifsym 130, 149, 150, 183, 227, 229, 247	ucs 245
igo 187, 247	ulsy 37, 95, 229, 247
inputenc 245	umranda 210, 211, 247
isoent 244	umrandb 211, 212, 247
junicode 245, 247	underscore 14
keystroke 134, 247	undertilde 115, 247
knitting 193, 247, 248	units 126
knot 213, 217, 247	universa 150, 182, 247
latexsym 31, 52, 64, 75, 124, 226, 247	upgreek 16, 98, 247
<i>lilyglyphs</i> 163, 166–173, 178–180	upquote 242
lilyglyphs 247	url 242
linearA 154, 247, 248	urwchancal 128, 247
linearb 157, 158, 247, 248	ushort 116, 247, 248
logic 135	vietnam 247
longdiv 112	vntex 16, 21
magic 224, 247	wasysym 20, 26, 28, 32, 43, 53, 65, 68, 119, 124, 130, 131, 133, 136, 143, 144, 146, 163, 181, 227, 247
manfnt 181, 247	webomints 209, 210, 247
marvosym 25, 26, 122, 132, 134, 136, 141, 143, 182, 192, 227	w sui pa 19, 23, 25, 227, 229, 234, 247
mathabx 30, 33, 37, 43, 54, 65, 68, 73, 76, 77, 95, 100, 102, 104, 110, 114, 122, 124, 132, 186, 226, 227, 247	xfrac 126
mathbbol 128, 129	yfonts 128, 129, 247
mathcomp 121	yhmath 112, 113, 115, 121, 234, 247
mathdesign 26, 37, 51, 101, 108, 127, 247		
mathdots 110, 119, 120, 234, 247		

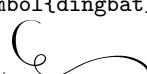
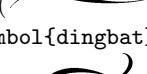
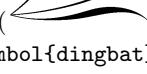
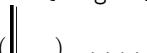
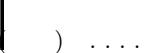
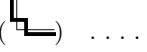
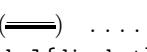
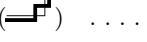
\PackingWaste (⌚)	192	\partiallvarlcircleleftint (°)	78	percussion	165
Pakin, Scott . . . 1, 233, 235, 246		\partiallvarlcirclerightint (°)	125	\permil (%)	28
\Pallas (♀)	133	\partiallvarlcirclerightint (°)	78	\Perp (⊤)	53
\pan (⟲)	196	\partiallvarlcircleleftint (°)	125	\Perp (⊤)	60
paperclip	197–198	\partiallvarlcircleleftint (°)	78	\Perp (⊤)	64
\PaperLandscape (▣)	183	\partiallvaroint (○)	125	\perp (⊥)	52, 233
\PaperPortrait (▤)	183	\partiallvaroint (○)	125	\perp (⊥)	58
par see \bindnasrepma, \invamp, and \parr		\partiallvarrcircleleftint (°)	125	\perp (⊥)	56
paragraph mark see \P		\partiallvarrcircleleftint (°)	78	\perp (⊥)	61
\parallel ()	52, 105	\partiallvarrcirclerightint (○)	125	\perps (⊥)	126
\parallel ()	58	\partiallvarrcirclerightint (○)	78	\perthousand (%)	130
\parallel ()	56	\partiallvarrcirclerightint (○)	125	\Pfanne (⟲)	196
\parallel ()	61	\partiallvarrcirclerightint (○)	78	\Pfund (₩)	26
\parallelogram (□)	149	\partiallvarstrokedint (‐)	125	\PgDown (Page ↓)	134
\parallelogramblack (■)	149	\partiallvarsumint (Σ)	125	\PgUp (Page ↑)	134
parallelograms 148–149, 222		particle-physics symbols	137–138	phaistos (package)	153, 247
\ParallelPort (▣)	134	\partof (3)	229	Phaistos disk	153
\paralleislant (//)	64	parts per thousand see \textperthousand		pharmaceutical prescription see \textrecipe	
\parr (↗)	37	\partvoice (♫)	23	\PHarrow (↑)	153
\parsim (#)	61	\partvoiceless (♫)	23	\phase (▢)	131
\partial (∂)	100	\passedpawn (♂)	186	phasor	131
\partial (∂)	100	\PAUSe (▀)	164	\PHbee (🐝)	153
\partial (∂)	102	\PAuse (▀)	164	\PHbeehive (🐝)	153
\partialmeetcontraction (≤)	72	\pause (▬)	164	\PHboomerang (➤)	153
\partialslash (∅)	100	pawn	187, 224–226	\PHbow (🏹)	153
\partialvardint (…).	125	\PD (¶)	134	\PHbullLeg (🦵)	153
\partialvardlanddownint (⌄)	125	PDF	163	\PHcaptive (🦵)	153
\partialvardlandupint (⌜)	125	.pdf files	244	\PHcarpentryPlane (镱)	153
\partialvardlcircleleftint (○)	125	pdflATEX	245	\PHcat (🐈)	153
\partialvardlcircleleftint (○)	77	\Peace (✌)	152	\PHchild (👶)	153
\partialvardlcirclerightint (○)	125	\PeaceDove (🕊)	182	\PHclub (��)	153
\partialvardlcirclerightint (○)	77	\Ped (_PED...)	164	\PHcolumn (עמוד)	153
\partialvardoint (○)	125	\peeler (庖)	196	\PHcomb (鬘)	153
\partialvardoint (○)	125	\pencil (笔)	141	\PHdolium (鬘)	153
\partialvardrcircleleftint (○)	125	\PencilLeft (笔)	141	\PHdove (鸽)	153
\partialvardrcircleleftint (○)	77	\PencilLeftDown (笔)	141	\PHeagle (鹰)	153
\partialvardrcirclerightint (○)	125	\PencilLeftUp (笔)	141	\PHflute (笛)	153
\partialvardrcirclerightint (○)	78	\PencilRight (笔)	141	\PHgauntlet (手套)	153
\partialvardstrokedint (‐)	125	\PencilRightDown (笔)	141	\PHgrater (擦)	153
\partialvardsumint (Σ)	125	\PencilRightUp (笔)	141	\PHhelmet (盔)	153
\partiallvaroint (…).	125	pencils	141, 142	\PHhide (隐身)	153
\partiallvarlcircleleftint (○)	125	\pentagon (◇)	149	\PHhorn (号)	153
\partiallvarlcircleleftint (○)	125	\pentagon (◇)	146		
\partiallvarrcircleleftint (○)	125	\pentagonblack (◆)	149		
\partiallvarrcirclerightint (○)	125	\Pentagram (★)	133		
\partiallvarrcirclerightint (○)	78	\pentagram (★)	38		
\partiallvarstrokedint (‐)	125	\pentam (□□□□□ □□□□□)	189		
\partiallvarsumint (Σ)		\pentdot (●)	162		
\partiallvaroint (…).		\penteye (⊕)	162		
people see faces		percent sign see \%			

\Phi (Φ)	97	\Pict2e (package)	131	\Pisymbol{astrosym}{4} (⌚)	206
\phi (ϕ)	97	\Pifont (package)	17, 139, 141–145, 150, 152, 204, 210, 221, 229, 247	\Pisymbol{astrosym}{5} (⌚)	206
\phimeson (φ)	138	\pigpen (package)	191, 247, 248	\Pisymbol{astrosym}{6} (⌚)	206
\phimesonnull (φ°)	138	\pigpen cipher	191	\Pisymbol{astrosym}{7} (⌚)	206
\phiup (ϕ)	98	{\pigpenfont A} (⌚)	191	\Pisymbol{astrosym}{8} (⌚)	206
\PHlid (⌚)	153	{\pigpenfont B} (⌚)	191	\Pisymbol{astrosym}{9} (⌚)	206
\PHlily (⌚)	153	{\pigpenfont C} (⌚)	191	\Pisymbol{astrosym}{10} (⌚)	206
\PHmanacles (⌚)	153	{\pigpenfont D} (⌚)	191	\Pisymbol{astrosym}{11} (⌚)	206
\PHmattock (⌚)	153	{\pigpenfont E} (⌚)	191	\Pisymbol{astrosym}{12} (⌚)	206
\Phone (⌚)	152	{\pigpenfont F} (⌚)	191	\Pisymbol{astrosym}{13} (⌚)	206
\phone (⌚)	181	{\pigpenfont G} (⌚)	191	\Pisymbol{astrosym}{14} (⌚)	206
\PhoneHandset (⌚)	152	{\pigpenfont H} (⌚)	191	\Pisymbol{astrosym}{15} (⌚)	206
phonetic (package)	20, 23, 229, 247	{\pigpenfont I} (⌚)	191	\Pisymbol{astrosym}{16} (⌚)	206
phonetic symbols	17–20	{\pigpenfont J} (⌚)	191	\Pisymbol{astrosym}{17} (⌚)	206
\phonon (⌚)	138	{\pigpenfont K} (⌚)	191	\Pisymbol{astrosym}{18} (⌚)	206
\photon (⌚)	130	{\pigpenfont L} (⌚)	191	\Pisymbol{astrosym}{19} (⌚)	206
photons	130, 137–138	{\pigpenfont M} (⌚)	191	\Pisymbol{astrosym}{20} (⌚)	207
\PHoxBack (⌚)	153	{\pigpenfont N} (⌚)	191	\Pisymbol{astrosym}{21} (⌚)	207
\PHpapyrus (⌚)	153	{\pigpenfont O} (⌚)	191	\Pisymbol{astrosym}{22} (⌚)	207
\PHpedestrian (⌚)	153	{\pigpenfont P} (⌚)	191	\Pisymbol{astrosym}{23} (⌚)	207
\PHplaneTree (⌚)	153	{\pigpenfont Q} (⌚)	191	\Pisymbol{astrosym}{24} (⌚)	207
\PHplumedHead (⌚)	153	{\pigpenfont R} (⌚)	191	\Pisymbol{astrosym}{25} (⌚)	207
\PHram (⌚)	153	{\pigpenfont S} (⌚)	191	\Pisymbol{astrosym}{26} (⌚)	207
\PHrosette (⌚)	153	{\pigpenfont T} (⌚)	191	\Pisymbol{astrosym}{27} (⌚)	207
\PHsaw (⌚)	153	{\pigpenfont U} (⌚)	191	\Pisymbol{astrosym}{28} (⌚)	207
\PHshield (⌚)	153	{\pigpenfont V} (⌚)	191	\Pisymbol{astrosym}{29} (⌚)	207
\PHship (⌚)	153	{\pigpenfont W} (⌚)	191		
\PHsling (⌚)	153	{\pigpenfont X} (⌚)	191		
\PHsmallAxe (⌚)	153	{\pigpenfont Y} (⌚)	191		
\PHstrainer (⌚)	153	{\pigpenfont Z} (⌚)	191		
\PHtattooedHead (⌚)	153	pilcrow	see \P		
\PHtiara (⌚)	153	\pionminus (π⁻)	138		
\PHtunny (⌚)	153	\pionnull (π°)	138		
\PHvine (⌚)	153	\pionplus (π⁺)	138		
\PHwavyBand (⌚)	153	pipe	see \textpipe		
\PHwoman (⌚)	153	\Pisces (♓)	132		
physical symbols	130	\Pisces (♓)	133		
\Pi (Π)	97	\Pisces (♓)	132		
\pi (π)	97	\pisces (♓)	131		
\pi (π)	98	\Pisymbol{astrosym}{0} (⌚)	204–225, 229		
“pi” fonts	229	\Pisymbol{astrosym}{1} (⌚)	206		
piano (p)	168, 179	\Pisymbol{astrosym}{2} (⌚)	206		
\Pickup (⌚)	136	\Pisymbol{astrosym}{3} (⌚)	206		

\Pisymbol{astrosym}{30} (♂) 207	\Pisymbol{astrosym}{55} (Ӯ) 207	\Pisymbol{astrosym}{104} (Ӯ) 208
\Pisymbol{astrosym}{31} (Ӫ) 207	\Pisymbol{astrosym}{56} (Ӱ) 207	\Pisymbol{astrosym}{105} (Ӵ) 208
\Pisymbol{astrosym}{32} (Ӆ) 207	\Pisymbol{astrosym}{57} (ӷ) 208	\Pisymbol{astrosym}{106} (ӷ) 208
\Pisymbol{astrosym}{33} (* 207	\Pisymbol{astrosym}{58} (Ӹ) 208	\Pisymbol{astrosym}{107} (ӹ) 208
\Pisymbol{astrosym}{34} (Ӷ) 207	\Pisymbol{astrosym}{59} (Ӆ) 208	\Pisymbol{astrosym}{108} (ӻ) 208
\Pisymbol{astrosym}{35} (↗) 207	\Pisymbol{astrosym}{60} (* 208	\Pisymbol{astrosym}{109} (Ӫ) 208
\Pisymbol{astrosym}{36} (Ӿ) 207	\Pisymbol{astrosym}{61} (Δ) 208	\Pisymbol{astrosym}{110} (Ҫ) 208
\Pisymbol{astrosym}{37} (Ӧ) 207	\Pisymbol{astrosym}{62} (Ӆ) 208	\Pisymbol{astrosym}{111} (Ѷ) 208
\Pisymbol{astrosym}{38} (□) 207	\Pisymbol{astrosym}{63} (Ӯ) 208	\Pisymbol{astrosym}{112} (Ӯ) 208
\Pisymbol{astrosym}{39} (ӭ) 207	\Pisymbol{astrosym}{64} (Ӫ) 208	\Pisymbol{astrosym}{113} (ڶ) 208
\Pisymbol{astrosym}{40} (●) 207	\Pisymbol{astrosym}{65} (ݧ) 208	\Pisymbol{astrosym}{114} (ܽ) 208
\Pisymbol{astrosym}{41} (ڶ) 207	\Pisymbol{astrosym}{66} (Ӯ) 208	\Pisymbol{astrosym}{115} (Ӫ) 208
\Pisymbol{astrosym}{42} (Ҫ) 207	\Pisymbol{astrosym}{67} (ܽ) 208	\Pisymbol{astrosym}{116} (ܪ) 208
\Pisymbol{astrosym}{43} (ܽ) 207	\Pisymbol{astrosym}{68} (ܵ) 208	\Pisymbol{astrosym}{117} (ܲ) 208
\Pisymbol{astrosym}{44} (ܶ) 207	\Pisymbol{astrosym}{69} (* 208	\Pisymbol{astrosym}{118} (ܪ) 208
\Pisymbol{astrosym}{45} (ܱ) 207	\Pisymbol{astrosym}{70} (ܵ) 208	\Pisymbol{astrosym}{119} (ܶ) 209
\Pisymbol{astrosym}{46} (ܳ) 207	\Pisymbol{astrosym}{71} (ܵ) 208	\Pisymbol{astrosym}{120} (ܰ) 209
\Pisymbol{astrosym}{47} (ܲ) 207	\Pisymbol{astrosym}{72} (ܵ) 208	\Pisymbol{astrosym}{121} (ܮ) 209
\Pisymbol{astrosym}{48} (ܵ) 207	\Pisymbol{astrosym}{73} (ܵ) 208	\Pisymbol{astrosym}{122} (ܵ) 209
\Pisymbol{astrosym}{49} (ܶ) 207	\Pisymbol{astrosym}{74} (ܵ) 208	\Pisymbol{astrosym}{123} (ܵ) 209
\Pisymbol{astrosym}{50} (ܵ) 207	\Pisymbol{astrosym}{75} (ܵ) 208	\Pisymbol{astrosym}{124} (ܵ) 209
\Pisymbol{astrosym}{51} (ܵ) 207	\Pisymbol{astrosym}{76} (ܵ) 208	\Pisymbol{astrosym}{125} (ܪ) 209
\Pisymbol{astrosym}{52} (ܮ) 207	\Pisymbol{astrosym}{77} (ܵ) 208	\Pisymbol{astrosym}{126} (ܵ) 209
\Pisymbol{astrosym}{53} (ܵ) 207	\Pisymbol{astrosym}{78} (ܵ) 208	\Pisymbol{astrosym}{127} (ܮ) 209
\Pisymbol{astrosym}{54} (ܵ) 207	\Pisymbol{astrosym}{79} (ܵ) 208	\Pisymbol{astrosym}{128} (ܮ) 209

\Pisymbol{astrosym}{130} (♂) 209	\Pisymbol{astrosym}{155} (○) 207	\Pisymbol{astrosym}{188} (○) 207
\Pisymbol{astrosym}{131} (◑) 209	\Pisymbol{astrosym}{156} (◑) 207	\Pisymbol{astrosym}{189} (ℒ) 207
\Pisymbol{astrosym}{132} (■) 206	\Pisymbol{astrosym}{157} (○) 207	\Pisymbol{astrosym}{190} (♀) 207
\Pisymbol{astrosym}{133} (★) 206	\Pisymbol{astrosym}{158} (▽) 207	\Pisymbol{astrosym}{191} (※) 207
\Pisymbol{astrosym}{134} (◎) 206	\Pisymbol{astrosym}{159} (L) 207	\Pisymbol{astrosym}{200} (⊙) 207
\Pisymbol{astrosym}{135} (↙) 206	\Pisymbol{astrosym}{160} (★) 207	\Pisymbol{astrosym}{201} (♀) 207
\Pisymbol{astrosym}{136} (○) 206	\Pisymbol{astrosym}{161} (△) 207	\Pisymbol{astrosym}{202} (♀) 207
\Pisymbol{astrosym}{137} (♂) 206	\Pisymbol{astrosym}{162} (□) 207	\Pisymbol{astrosym}{203} (⊕) 207
\Pisymbol{astrosym}{138} (□) 206	\Pisymbol{astrosym}{163} (×) 207	\Pisymbol{astrosym}{204} (○) 207
\Pisymbol{astrosym}{139} (○) 206	\Pisymbol{astrosym}{164} (⊖) 207	\Pisymbol{astrosym}{205} (△) 208
\Pisymbol{astrosym}{140} (●) 206	\Pisymbol{astrosym}{165} (♂) 207	\Pisymbol{astrosym}{206} (☿) 208
\Pisymbol{astrosym}{141} (◎) 206	\Pisymbol{astrosym}{166} (○) 207	\Pisymbol{astrosym}{207} (○) 208
\Pisymbol{astrosym}{142} (●) 206	\Pisymbol{astrosym}{167} (ℒ) 207	\Pisymbol{astrosym}{208}	(↑↑) 208
\Pisymbol{astrosym}{143} (●) 206	\Pisymbol{astrosym}{168} (♀) 207	\Pisymbol{astrosym}{209} (◑) 208
\Pisymbol{astrosym}{144} (◎) 206	\Pisymbol{astrosym}{169} (※) 207	\Pisymbol{astrosym}{210} (◎) 208
\Pisymbol{astrosym}{145} (◑) 206	\Pisymbol{astrosym}{170} (♀) 207	\Pisymbol{astrosym}{211} (▽) 208
\Pisymbol{astrosym}{146} (●) 206	\Pisymbol{astrosym}{171} (○) 207	\Pisymbol{astrosym}{212} (○) 208
\Pisymbol{astrosym}{147} (◑) 206	\Pisymbol{astrosym}{172} (×) 207	\Pisymbol{astrosym}{213} (○) 208
\Pisymbol{astrosym}{148} (○) 206	\Pisymbol{astrosym}{173} (△) 207	\Pisymbol{astrosym}{214}	(⊖) 208
\Pisymbol{astrosym}{149} (◎) 206	\Pisymbol{astrosym}{174} (□) 207	\Pisymbol{astrosym}{215} (○) 208
\Pisymbol{astrosym}{150} (★) 206	\Pisymbol{astrosym}{175} (×) 207	\Pisymbol{astrosym}{216}	(□) 208
\Pisymbol{astrosym}{151} (★) 206	\Pisymbol{astrosym}{176} (△) 207	\Pisymbol{astrosym}{217} (○) 208
\Pisymbol{astrosym}{152} (△) 207	\Pisymbol{astrosym}{177} (□) 207	\Pisymbol{astrosym}{218}	(○) 208
\Pisymbol{astrosym}{153} (□) 207	\Pisymbol{astrosym}{178} (×) 207	\Pisymbol{astrosym}{219} (△) 208
\Pisymbol{astrosym}{154} (★) 207	\Pisymbol{astrosym}{179} (○) 207	\Pisymbol{astrosym}{220} (○) 208

\Pisymbol{dancers}{205} (⌚ 218	\Pisymbol{dancers}{234} (⌚ 219	\Pisymbol{dice3d}{100} (▣) 223
\Pisymbol{dancers}{206} (⌚ 218	\Pisymbol{dancers}{235} (⌚ 219	\Pisymbol{dice3d}{101} (▣) 223
\Pisymbol{dancers}{207} (⌚ 218	\Pisymbol{dancers}{236} (⌚ 219	\Pisymbol{dice3d}{102} (▣) 223
\Pisymbol{dancers}{208} (⌚ 218	\Pisymbol{dancers}{237} (⌚ 219	\Pisymbol{dice3d}{103} (▣) 223
\Pisymbol{dancers}{209} (⌚ 218	\Pisymbol{dancers}{238} (⌚ 219	\Pisymbol{dice3d}{104} (▣) 223
\Pisymbol{dancers}{210} (⌚ 218	\Pisymbol{dancers}{239} (⌚ 219	\Pisymbol{dice3d}{105} (▣) 223
\Pisymbol{dancers}{211} (⌚ 218	\Pisymbol{dancers}{240} (⌚ 219	\Pisymbol{dice3d}{106} (▣) 223
\Pisymbol{dancers}{212} (⌚ 218	\Pisymbol{dancers}{241} (⌚ 219	\Pisymbol{dice3d}{107} (▣) 223
\Pisymbol{dancers}{213} (⌚ 218	\Pisymbol{dancers}{242} (⌚ 219	\Pisymbol{dice3d}{108} (▣) 223
\Pisymbol{dancers}{214} (⌚ 218	\Pisymbol{dancers}{243} (⌚ 219	\Pisymbol{dice3d}{109} (▣) 223
\Pisymbol{dancers}{215} (⌚ 218	\Pisymbol{dancers}{244} (⌚ 219	\Pisymbol{dice3d}{110} (▣) 223
\Pisymbol{dancers}{216} (⌚ 218	\Pisymbol{dancers}{245} (⌚ 219	\Pisymbol{dice3d}{111} (▣) 223
\Pisymbol{dancers}{217} (⌚ 218	\Pisymbol{dancers}{246} (⌚ 219	\Pisymbol{dice3d}{112} (▣) 223
\Pisymbol{dancers}{218} (⌚ 218	\Pisymbol{dancers}{247} (⌚ 219	\Pisymbol{dice3d}{113} (▣) 223
\Pisymbol{dancers}{219} (⌚ 218	\Pisymbol{dancers}{248} (⌚ 219	\Pisymbol{dice3d}{114} (▣) 223
\Pisymbol{dancers}{220} (⌚ 218	\Pisymbol{dancers}{249} (⌚ 219	\Pisymbol{dice3d}{115} (▣) 223
\Pisymbol{dancers}{221} (⌚ 219	\Pisymbol{dancers}{250} (⌚ 219	\Pisymbol{dice3d}{116} (▣) 223
\Pisymbol{dancers}{222} (⌚ 219	\Pisymbol{dancers}{251} (⌚ 219	\Pisymbol{dice3d}{117} (▣) 223
\Pisymbol{dancers}{223} (⌚ 219	\Pisymbol{dancers}{252} (⌚ 219	\Pisymbol{dice3d}{118} (▣) 223
\Pisymbol{dancers}{224} (⌚ 219	\Pisymbol{dancers}{253} (⌚ 220	\Pisymbol{dice3d}{119} (▣) 223
\Pisymbol{dancers}{225} (⌚ 219	\Pisymbol{dancers}{254} (⌚ 220	\Pisymbol{dice3d}{120} (▣) 223
\Pisymbol{dancers}{226} (⌚ 219	\Pisymbol{dancers}{255} (⌚ 220	\Pisymbol{dingbat}{69}	
\Pisymbol{dancers}{227} (⌚ 219	\Pisymbol{dice3d}{49} (▣) 223		(C) 213
\Pisymbol{dancers}{228} (⌚ 219	\Pisymbol{dice3d}{50} (▣) 223)	
\Pisymbol{dancers}{229} (⌚ 219	\Pisymbol{dice3d}{51} (▣) 223			
\Pisymbol{dancers}{230} (⌚ 219	\Pisymbol{dice3d}{52} (▣) 223			
\Pisymbol{dancers}{231} (⌚ 219	\Pisymbol{dice3d}{53} (▣) 223			
\Pisymbol{dancers}{232} (⌚ 219	\Pisymbol{dice3d}{54} (▣) 223			
\Pisymbol{dancers}{233} (⌚ 219	\Pisymbol{dice3d}{97} (▣) 223		
		\Pisymbol{dice3d}{98} (▣) 223		
		\Pisymbol{dice3d}{99} (▣) 223		
				\Pisymbol{dingbat}{70}	
				(C) 213
)	

	213
\Pisymbol{dingbat}{72}		
	213
\Pisymbol{dingbat}{74}		
	213
\Pisymbol{dingbat}{75}		
	213
\Pisymbol{dingbat}{76}		
	213
\Pisymbol{dingbat}{77}		
	213
\Pisymbol{dingbat}{97}	
		213
\Pisymbol{dingbat}{98}	
		213
\Pisymbol{dingbat}{99}	
		213
\Pisymbol{dingbat}{100}		
	213
\Pisymbol{dingbat}{101}		
	213
\Pisymbol{dingbat}{102}		
	213
\Pisymbol{dingbat}{103}		
	213
\Pisymbol{dingbat}{104}		
	213
\Pisymbol{fselch}{0}		224
\Pisymbol{fselch}{1}		224
\Pisymbol{fselch}{2}		224
\Pisymbol{fselch}{3}		224
\Pisymbol{fselch}{4}		224
\Pisymbol{fselch}{5}		224
\Pisymbol{fselch}{6}		224
\Pisymbol{fselch}{7}		224
\Pisymbol{fselch}{8}		224
\Pisymbol{fselch}{9}		224
\Pisymbol{fselch}{10}		224
\Pisymbol{fselch}{11}		224
\Pisymbol{fselch}{12}		224
\Pisymbol{fselch}{13}		224
\Pisymbol{fselch}{14}		224
\Pisymbol{fselch}{15}		224
\Pisymbol{fselch}{16}		225
\Pisymbol{fselch}{17}		225
\Pisymbol{fselch}{18}		225
\Pisymbol{fselch}{19}		225
\Pisymbol{fselch}{20}		225
\Pisymbol{fselch}{21}		225
\Pisymbol{fselch}{22}		225
\Pisymbol{fselch}{23}		225
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\Pisymbol{fselch}{25}		225
\Pisymbol{fselch}{26}		225
\Pisymbol{fselch}{27}		225
\Pisymbol{fselch}{28}		225
\Pisymbol{fselch}{29}		225
\Pisymbol{fselch}{30}		225
\Pisymbol{fselch}{31}		225
\Pisymbol{fselch}{32}		225
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\Pisymbol{fselch}{35}		225
\Pisymbol{fselch}{36}		225
\Pisymbol{fselch}{37}		225
\Pisymbol{fselch}{38}		225
\Pisymbol{fselch}{39}		225
\Pisymbol{fselch}{40}		225
\Pisymbol{fselch}{41}		225
\Pisymbol{fselch}{42}		225
\Pisymbol{fselch}{43}		225
\Pisymbol{fselch}{44}		225
\Pisymbol{fselch}{45}		225
\Pisymbol{fselch}{46}		225
\Pisymbol{fselch}{47}		225
\Pisymbol{fselch}{48}		225
\Pisymbol{fselch}{49}		225
\Pisymbol{fselch}{50}		225
\Pisymbol{fselch}{51}		225
\Pisymbol{fselch}{52}		225
\Pisymbol{fselch}{53}		225
\Pisymbol{fselch}{54}		225
\Pisymbol{fselch}{55}		224
\Pisymbol{fselch}{56}		224
\Pisymbol{fselch}{57}		224
\Pisymbol{fselch}{58}		224
\Pisymbol{fselch}{59}		224
\Pisymbol{fselch}{60}		224
\Pisymbol{fselch}{61}		224

\Pisymbol{fselch}{140} (☒)	225	\Pisymbol{knot1}{49} (☒)	213	\Pisymbol{knot1}{98} (☒)	214
.....		\Pisymbol{knot1}{50} (☒)	213	\Pisymbol{knot1}{99} (☒)	214
\Pisymbol{fselch}{141} (☒)	225	\Pisymbol{knot1}{51} (◆)	213	\Pisymbol{knot1}{100} (☒)	214
.....		\Pisymbol{knot1}{52} (●)	213	\Pisymbol{knot1}{101} (☒)	214
\Pisymbol{fselch}{142} (☒)	225	\Pisymbol{knot1}{53} (☒)	213	\Pisymbol{knot1}{102} (☒)	214
.....		\Pisymbol{knot1}{58} (☒)	213	\Pisymbol{knot1}{103} (☒)	214
\Pisymbol{fselch}{143} (☒)	225	\Pisymbol{knot1}{59} (☒)	214	\Pisymbol{knot1}{104} (☒)	214
.....		\Pisymbol{knot1}{60} (☒)	214	\Pisymbol{knot1}{105} (☒)	214
\Pisymbol{fselch}{144} (☒)	225	\Pisymbol{knot1}{61} (☒)	214	\Pisymbol{knot2}{48} (☒)	214
.....		\Pisymbol{knot1}{62} (☒)	214	\Pisymbol{knot2}{49} (☒)	214
\Pisymbol{fselch}{145} (○)	225	\Pisymbol{knot1}{63} (☒)	214	\Pisymbol{knot2}{50} (☒)	214
.....		\Pisymbol{knot1}{64} (☒)	214	\Pisymbol{knot2}{51} (◆)	214
\Pisymbol{fselch}{151} (○)	225	\Pisymbol{knot1}{65} (☒)	214	\Pisymbol{knot2}{52} (●)	214
.....		\Pisymbol{knot1}{66} (☒)	214	\Pisymbol{knot2}{53} (☒)	214
\Pisymbol{fselch}{157} (●)	225	\Pisymbol{knot1}{67} (☒)	214	\Pisymbol{knot2}{58} (☒)	214
.....		\Pisymbol{knot1}{68} (☒)	213	\Pisymbol{knot2}{59} (☒)	214
\Pisymbol{fselch}{163} (○)	225	\Pisymbol{knot1}{69} (☒)	213	\Pisymbol{knot2}{60} (☒)	214
.....		\Pisymbol{knot1}{70} (☒)	213	\Pisymbol{knot2}{61} (☒)	214
\Pisymbol{fselch}{169} (○)	225	\Pisymbol{knot1}{71} (☒)	213	\Pisymbol{knot2}{62} (☒)	214
.....		\Pisymbol{knot1}{72} (☒)	213	\Pisymbol{knot2}{63} (☒)	214
\Pisymbol{fselch}{175} (●)	225	\Pisymbol{knot1}{73} (☒)	213	\Pisymbol{knot2}{64} (☒)	214
.....		\Pisymbol{knot1}{74} (☒)	213	\Pisymbol{knot2}{65} (☒)	214
\Pisymbol{fselch}{180} (☒)	225	\Pisymbol{knot1}{75} (☒)	214	\Pisymbol{knot2}{66} (☒)	214
.....		\Pisymbol{knot1}{76} (☒)	214	\Pisymbol{knot2}{67} (☒)	214
\Pisymbol{fselch}{186} (☒)	225	\Pisymbol{knot1}{77} (☒)	214	\Pisymbol{knot2}{68} (☒)	214
.....		\Pisymbol{knot1}{78} (☒)	214	\Pisymbol{knot2}{69} (☒)	214
\Pisymbol{fselch}{192} (☒)	225	\Pisymbol{knot1}{79} (☒)	214	\Pisymbol{knot2}{70} (☒)	214
.....		\Pisymbol{knot1}{80} (☒)	214	\Pisymbol{knot2}{71} (☒)	214
\Pisymbol{fselch}{198} (☒)	225	\Pisymbol{knot1}{81} (☒)	214	\Pisymbol{knot2}{72} (☒)	214
.....		\Pisymbol{knot1}{82} (☒)	214	\Pisymbol{knot2}{73} (☒)	214
\Pisymbol{fselch}{204} (☒)	225	\Pisymbol{knot1}{83} (☒)	214	\Pisymbol{knot2}{74} (☒)	214
.....		\Pisymbol{knot1}{84} (☒)	213	\Pisymbol{knot2}{75} (☒)	214
\Pisymbol{fselch}{210} (☒)	225	\Pisymbol{knot1}{85} (☒)	213	\Pisymbol{knot2}{76} (☒)	214
.....		\Pisymbol{knot1}{86} (☒)	213	\Pisymbol{knot2}{77} (☒)	214
\Pisymbol{fselch}{216} (☒)	225	\Pisymbol{knot1}{87} (☒)	213	\Pisymbol{knot2}{78} (☒)	214
.....		\Pisymbol{knot1}{88} (☒)	213	\Pisymbol{knot2}{79} (☒)	214
\Pisymbol{fselch}{222} (☒)	225	\Pisymbol{knot1}{89} (☒)	213	\Pisymbol{knot2}{80} (☒)	214
.....		\Pisymbol{knot1}{90} (☒)	213	\Pisymbol{knot2}{81} (☒)	214
\Pisymbol{fselch}{228} (☒)	225	\Pisymbol{knot1}{91} (☒)	213	\Pisymbol{knot2}{82} (☒)	214
.....		\Pisymbol{knot1}{92} (☒)	213	\Pisymbol{knot2}{83} (☒)	214
\Pisymbol{fselch}{234} (☒)	225	\Pisymbol{knot1}{93} (☒)	213	\Pisymbol{knot2}{84} (☒)	214
.....		\Pisymbol{knot1}{94} (☒)	213	\Pisymbol{knot2}{85} (☒)	214
\Pisymbol{fselch}{240} (☒)	225	\Pisymbol{knot1}{95} (☒)	213	\Pisymbol{knot2}{86} (☒)	214
.....		\Pisymbol{knot1}{96} (☒)	213	\Pisymbol{knot2}{87} (☒)	214
\Pisymbol{fselch}{246} (☒)	225	\Pisymbol{knot1}{97} (☒)	213	\Pisymbol{knot2}{88} (☒)	214
.....				\Pisymbol{knot2}{89} (☒)	214
\Pisymbol{greenpoint}{71} (◐)	204			\Pisymbol{knot2}{90} (☒)	214
.....				\Pisymbol{knot2}{91} (☒)	214
\Pisymbol{hands}{65} (◑)	204			\Pisymbol{knot2}{92} (☒)	214
\Pisymbol{hands}{66} (◑)	204			\Pisymbol{knot2}{93} (☒)	214
\Pisymbol{hands}{67} (◑)	204			\Pisymbol{knot2}{94} (☒)	214
\Pisymbol{hands}{68} (◑)	204			\Pisymbol{knot2}{95} (☒)	214
\Pisymbol{knot1}{48} (☒)	213			\Pisymbol{knot2}{96} (☒)	214

\Pisymbol{knot2}{79} (⤵)	214	\Pisymbol{knot3}{67} (⤶)	215	\Pisymbol{knot4}{51} (◆)	215
\Pisymbol{knot2}{80} (⤷)	214	\Pisymbol{knot3}{68} (⤸)	214	\Pisymbol{knot4}{52} (●)	215
\Pisymbol{knot2}{81} (⤹)	214	\Pisymbol{knot3}{69} (⤹)	214	\Pisymbol{knot4}{53} (◻)	215
\Pisymbol{knot2}{82} (⤻)	214	\Pisymbol{knot3}{70} (⤻)	214	\Pisymbol{knot4}{58} (⤻)	215
\Pisymbol{knot2}{83} (⤼)	214	\Pisymbol{knot3}{71} (⤼)	214	\Pisymbol{knot4}{59} (⤼)	215
\Pisymbol{knot2}{84} (⤽)	214	\Pisymbol{knot3}{72} (⤽)	214	\Pisymbol{knot4}{60} (⤽)	215
\Pisymbol{knot2}{85} (⤾)	214	\Pisymbol{knot3}{73} (⤾)	214	\Pisymbol{knot4}{61} (⤾)	215
\Pisymbol{knot2}{86} (⤿)	214	\Pisymbol{knot3}{74} (⤿)	214	\Pisymbol{knot4}{62} (⤿)	215
\Pisymbol{knot2}{87} (⤿)	214	\Pisymbol{knot3}{75} (⤿)	214	\Pisymbol{knot4}{63} (⤿)	215
\Pisymbol{knot2}{88} (⤿)	214	\Pisymbol{knot3}{76} (⤿)	214	\Pisymbol{knot4}{64} (⤿)	215
\Pisymbol{knot2}{96} (⤿)	214	\Pisymbol{knot3}{77} (⤿)	214	\Pisymbol{knot4}{65} (⤿)	215
\Pisymbol{knot2}{97} (⤿)	214	\Pisymbol{knot3}{78} (⤿)	215	\Pisymbol{knot4}{66} (⤿)	215
\Pisymbol{knot2}{98} (⤿)	214	\Pisymbol{knot3}{79} (⤿)	215	\Pisymbol{knot4}{67} (⤿)	215
\Pisymbol{knot2}{99} (⤿)	214	\Pisymbol{knot3}{80} (⤿)	215	\Pisymbol{knot4}{68} (⤿)	215
\Pisymbol{knot2}{100} (⤿)	.	\Pisymbol{knot3}{81} (⤿)	215	\Pisymbol{knot4}{69} (⤿)	215
.....	214	\Pisymbol{knot3}{82} (⤿)	215	\Pisymbol{knot4}{70} (⤿)	215
\Pisymbol{knot2}{101} (⤿)	.	\Pisymbol{knot3}{83} (⤿)	215	\Pisymbol{knot4}{71} (⤿)	215
.....	214	\Pisymbol{knot3}{84} (⤿)	214	\Pisymbol{knot4}{72} (⤿)	215
\Pisymbol{knot2}{102} (⤿)	.	\Pisymbol{knot3}{85} (⤿)	214	\Pisymbol{knot4}{73} (⤿)	215
.....	214	\Pisymbol{knot3}{86} (⤿)	214	\Pisymbol{knot4}{74} (⤿)	215
\Pisymbol{knot2}{103} (⤿)	.	\Pisymbol{knot3}{87} (⤿)	214	\Pisymbol{knot4}{75} (⤿)	215
.....	214	\Pisymbol{knot3}{88} (⤿)	214	\Pisymbol{knot4}{76} (⤿)	215
\Pisymbol{knot2}{104} (⤿)	.	\Pisymbol{knot3}{96} (⤿)	214	\Pisymbol{knot4}{77} (⤿)	215
.....	214	\Pisymbol{knot3}{97} (⤿)	214	\Pisymbol{knot4}{78} (⤿)	215
\Pisymbol{knot2}{105} (⤿)	.	\Pisymbol{knot3}{98} (⤿)	214	\Pisymbol{knot4}{79} (⤿)	215
.....	214	\Pisymbol{knot3}{99} (⤿)	214	\Pisymbol{knot4}{80} (⤿)	215
\Pisymbol{knot3}{48} (□)	214	\Pisymbol{knot3}{100} (⤿)	.	\Pisymbol{knot4}{81} (⤿)	215
.....	214	\Pisymbol{knot3}{101} (⤿)	.	\Pisymbol{knot4}{82} (⤿)	215
\Pisymbol{knot3}{49} (⤿)	214	215	\Pisymbol{knot4}{83} (⤿)	215
\Pisymbol{knot3}{50} (⤿)	214	\Pisymbol{knot3}{102} (⤿)	.	\Pisymbol{knot4}{84} (⤿)	215
\Pisymbol{knot3}{51} (◆)	214	215	\Pisymbol{knot4}{85} (⤿)	215
\Pisymbol{knot3}{52} (●)	214	\Pisymbol{knot3}{103} (⤿)	.	\Pisymbol{knot4}{86} (⤿)	215
\Pisymbol{knot3}{53} (◻)	214	215	\Pisymbol{knot4}{87} (⤿)	215
\Pisymbol{knot3}{58} (⤿)	214	\Pisymbol{knot3}{104} (⤿)	.	\Pisymbol{knot4}{88} (⤿)	215
\Pisymbol{knot3}{59} (⤿)	214	215	\Pisymbol{knot4}{89} (⤿)	215
\Pisymbol{knot3}{60} (⤿)	214	\Pisymbol{knot3}{105} (⤿)	.	\Pisymbol{knot4}{90} (⤿)	215
\Pisymbol{knot3}{61} (⤿)	214	215	\Pisymbol{knot4}{91} (⤿)	215
\Pisymbol{knot3}{62} (⤿)	215	\Pisymbol{knot3}{48} (□)	215	\Pisymbol{knot4}{92} (⤿)	215
\Pisymbol{knot3}{63} (⤿)	215	\Pisymbol{knot3}{49} (⤿)	215	\Pisymbol{knot4}{93} (⤿)	215
\Pisymbol{knot3}{64} (⤿)	215	\Pisymbol{knot3}{50} (⤿)	215	\Pisymbol{knot4}{94} (⤿)	215
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\Pisymbol{knot3}{66} (⤿)	215	\Pisymbol{knot3}{52} (⤿)	215	\Pisymbol{knot4}{96} (⤿)	215

\Pisymbol{knot4}{100} () .	215
.....	215
\Pisymbol{knot4}{101} () .	215
.....	215
\Pisymbol{knot4}{102} () .	215
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\Pisymbol{knot4}{103} () .	215
.....	215
\Pisymbol{knot4}{104} () .	215
.....	215
\Pisymbol{knot4}{105} () .	215
.....	215
\Pisymbol{knot5}{48} () 215	
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\Pisymbol{knot5}{101} () .	
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\Pisymbol{knot5}{102} () .	
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\Pisymbol{knot5}{103} () .	
.....	215
\Pisymbol{knot5}{104} () .	
.....	216
\Pisymbol{knot5}{105} () .	
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\Pisymbol{knot6}{48} () 216	
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\Pisymbol{knot6}{76} () 216	
\Pisymbol{knot6}{77} () 216	
\Pisymbol{knot6}{78} () 216	
\Pisymbol{knot6}{79} () 216	
\Pisymbol{knot6}{80} () 216	

\Pisymbol{knot7}{53} 	216	\Pisymbol{knot7}{101} 	.	\Pisymbol{nkarta}{45} 	205
\Pisymbol{knot7}{58} 	216	216	\Pisymbol{nkarta}{46} 	205
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\Pisymbol{knot7}{70} 	216	\Pisymbol{magic}{51} 	224	\Pisymbol{nkarta}{58} 	205
\Pisymbol{knot7}{71} 	216	\Pisymbol{magic}{52} 	224	\Pisymbol{nkarta}{59} 	205
\Pisymbol{knot7}{72} 	216	\Pisymbol{magic}{53} 	224	\Pisymbol{nkarta}{60} 	205
\Pisymbol{knot7}{73} 	216	\Pisymbol{magic}{54} 	224	\Pisymbol{nkarta}{61} 	205
\Pisymbol{knot7}{74} 	216	\Pisymbol{magic}{55} 	224	\Pisymbol{nkarta}{62} 	205
\Pisymbol{knot7}{75} 	216	\Pisymbol{magic}{56} 	224	\Pisymbol{nkarta}{63} 	205
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\Pisymbol{knot7}{77} 	216	\Pisymbol{magic}{58} 	224	\Pisymbol{nkarta}{65} 	205
\Pisymbol{knot7}{78} 	216	\Pisymbol{magic}{59} 	224	\Pisymbol{nkarta}{66} 	205
\Pisymbol{knot7}{79} 	216	\Pisymbol{magic}{60} 	224	\Pisymbol{nkarta}{67} 	205
\Pisymbol{knot7}{80} 	216	\Pisymbol{magic}{61} 	224	\Pisymbol{nkarta}{68} 	205
\Pisymbol{knot7}{81} 	216	\Pisymbol{magic}{62} 	224	\Pisymbol{nkarta}{69} 	205
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\Pisymbol{knot7}{83} 	217	\Pisymbol{magic}{64} 	224	\Pisymbol{nkarta}{71} 	205
\Pisymbol{knot7}{84} 	216	\Pisymbol{moonphase}{0} 	.	\Pisymbol{nkarta}{72} 	205
\Pisymbol{knot7}{85} 	216	206	\Pisymbol{nkarta}{73} 	205
\Pisymbol{knot7}{86} 	216	\Pisymbol{moonphase}{1} 	.	\Pisymbol{nkarta}{74} 	205
\Pisymbol{knot7}{87} 	216	206	\Pisymbol{nkarta}{75} 	205
\Pisymbol{knot7}{88} 	216	\Pisymbol{moonphase}{2} 	.	\Pisymbol{nkarta}{76} 	205
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\Pisymbol{knot7}{91} 	216	206	\Pisymbol{nkarta}{79} 	205
\Pisymbol{knot7}{92} 	216	\Pisymbol{moonphase}{4} 	.	\Pisymbol{nkarta}{80} 	205
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\Pisymbol{knot7}{94}	216	\Pisymbol{moonphase}{5} 	.	\Pisymbol{nkarta}{82} 	205
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\Pisymbol{knot7}{96}	216	\Pisymbol{moonphase}{6} 	.	\Pisymbol{nkarta}{84} 	205
\Pisymbol{knot7}{97}	216	206	\Pisymbol{nkarta}{85} 	205
\Pisymbol{knot7}{98}	216	\Pisymbol{moonphase}{7} 	.	\Pisymbol{nkarta}{86} 	205
\Pisymbol{knot7}{99}	216	206	\Pisymbol{nkarta}{87} 	205
\Pisymbol{knot7}{100}	216	\Pisymbol{moonphase}{8} 	.	\Pisymbol{nkarta}{88} 	205
.....	216	204	\Pisymbol{nkarta}{89} 	205
.....	216	\Pisymbol{nkarta}{90} 	205	\Pisymbol{nkarta}{91} 	205
.....	216	\Pisymbol{nkarta}{92} 	206	\Pisymbol{nkarta}{93} 	206

\Pisymbol{nkarta}{94} (✉)	..	
..... 206		
\Pisymbol{nkarta}{95} (✉)	206	
\Pisymbol{nkarta}{96} (✉)	204	
\Pisymbol{nkarta}{97} (✉)	204	
\Pisymbol{nkarta}{98} (✉)	204	
\Pisymbol{nkarta}{99} (✉)	204	
\Pisymbol{nkarta}{100} (✉)	..	
..... 204		
\Pisymbol{nkarta}{101} (★)	..	
..... 204		
\Pisymbol{nkarta}{102} (▲)	..	
..... 204		
\Pisymbol{nkarta}{103} (↑)	..	
..... 204		
\Pisymbol{nkarta}{104} (↓)	..	
..... 204		
\Pisymbol{nkarta}{105} (○)	..	
..... 204		
\Pisymbol{nkarta}{106} (▲)	..	
..... 204		
\Pisymbol{nkarta}{107} (※)	..	
..... 204		
\Pisymbol{nkarta}{108} (□)	..	
..... 205		
\Pisymbol{nkarta}{109} (□)	..	
..... 205		
\Pisymbol{nkarta}{110} (⊗)	..	
..... 205		
\Pisymbol{nkarta}{111} (○)	..	
..... 205		
\Pisymbol{nkarta}{112} (◇)	..	
..... 205		
\Pisymbol{nkarta}{113} (△)	..	
..... 205		
\Pisymbol{nkarta}{114} (⊗)	..	
..... 205		
\Pisymbol{nkarta}{115} (✖)	..	
..... 205		
\Pisymbol{nkarta}{116} (◎)	..	
..... 205		
\Pisymbol{nkarta}{117} (○)	..	
..... 205		
\Pisymbol{nkarta}{118} (✖)	..	
..... 205		
\Pisymbol{nkarta}{119} (✖)	..	
..... 205		
\Pisymbol{nkarta}{120} (◎)	..	
..... 205		
\Pisymbol{nkarta}{121} (○)	..	
..... 205		
\Pisymbol{nkarta}{122} (i)	205	
\Pisymbol{nkarta}{123} (—)	..	
..... 205		
\Pisymbol{nkarta}{124} (↗)	..	
..... 205		
\Pisymbol{nkarta}{125} (↖)	..	
..... 205		
\Pisymbol{nkarta}{126} (✖)	..	
..... 205		
\Pisymbol{nkarta}{161} (♥)	..	
..... 205		
\Pisymbol{nkarta}{162} (♦)	..	
..... 205		
\Pisymbol{nkarta}{163} (♣)	..	
..... 205		
\Pisymbol{nkarta}{164}		
(—)	205	
\Pisymbol{nkarta}{165} (→)	..	
..... 205		
\Pisymbol{nkarta}{166} (←)	..	
..... 205		
\Pisymbol{nkarta}{167} (●)	..	
..... 205		
\Pisymbol{nkarta}{168} (⊗)	..	
..... 205		
\Pisymbol{nkarta}{169} (↑)	205	
\Pisymbol{nkarta}{170} (■)	..	
..... 205		
\Pisymbol{nkarta}{171} (※)	..	
..... 205		
\Pisymbol{nkarta}{172} (□)	..	
..... 205		
\Pisymbol{nkarta}{173} (✉)	..	
..... 205		
\Pisymbol{nkarta}{174} (+)	..	
..... 205		
\Pisymbol{nkarta}{175} (○)	..	
..... 205		
\Pisymbol{nkarta}{176} (●)	..	
..... 205		
\Pisymbol{nkarta}{177} (□)	..	
..... 205		
\Pisymbol{nkarta}{178} (↑)	..	
..... 205		
\Pisymbol{nkarta}{179} (✖)	..	
..... 205		
\Pisymbol{nkarta}{180} (○)	..	
..... 205		
\Pisymbol{nkarta}{181} (✖)	..	
..... 205		
\Pisymbol{nkarta}{182} (※)	..	
..... 205		
\Pisymbol{nkarta}{183} (※)	..	
..... 205		
\Pisymbol{nkarta}{184} (⊕)	..	
..... 205		
\Pisymbol{nkarta}{185} (▷)	..	
..... 205		
\Pisymbol{nkarta}{186} (❖)	..	
..... 205		
\Pisymbol{nkarta}{187} (↖)	..	
..... 205		
\Pisymbol{nkarta}{188} (↑)	205	
\Pisymbol{nkarta}{189} (✖)	..	
..... 205		
\Pisymbol{nkarta}{190} (✖)	..	
..... 206		
\Pisymbol{nkarta}{191} (○)	..	
..... 206		
\Pisymbol{nkarta}{192} (※)	..	
..... 206		
\Pisymbol{nkarta}{193} (●)	..	
..... 204		
\Pisymbol{nkarta}{194} (□)	..	
..... 204		
\Pisymbol{nkarta}{195} (✖)	..	
..... 204		
\Pisymbol{nkarta}{196} (✖)	..	
..... 204		
\Pisymbol{nkarta}{197} (□)	204	
\Pisymbol{nkarta}{198} (✚)	..	
..... 204		
\Pisymbol{nkarta}{199} (▼)	..	
..... 204		
\Pisymbol{nkarta}{200} (→)	..	
..... 204		
\Pisymbol{nkarta}{201} (△)	..	
..... 204		
\Pisymbol{nkarta}{202} (◆)	..	
..... 204		
\Pisymbol{nkarta}{203} (■)	..	
..... 204		
\Pisymbol{nkarta}{204} (■)	..	
..... 204		
\Pisymbol{nkarta}{205} (●)	..	
..... 205		
\Pisymbol{nkarta}{206} (■)	..	
..... 205		
\Pisymbol{nkarta}{207} (✖)	..	
..... 205		
\Pisymbol{nkarta}{208} (✖)	..	
..... 205		
\Pisymbol{nkarta}{209} (◀)	..	
..... 205		
\Pisymbol{nkarta}{210} (◀)	..	
..... 205		
\Pisymbol{nkarta}{211} (◀)	..	
..... 205		
\Pisymbol{nkarta}{212} (↓)	..	
..... 205		
\Pisymbol{nkarta}{213} (↑)	..	
..... 205		
\Pisymbol{nkarta}{214} (↖)	..	
..... 205		
\Pisymbol{nkarta}{215} (✉)	..	
..... 205		
\Pisymbol{nkarta}{216} (●)	..	
..... 205		
\Pisymbol{nkarta}{217} (✖)	..	
..... 205		
\Pisymbol{nkarta}{218} (●)	..	
..... 205		

\Pisymbol{nkarta}{219} (█)	.	\Pisymbol{nkarta}{249} (▀)	.	\Pisymbol{smfpr10}{73} (⌚)	.
..... 205	 205	 220	
\Pisymbol{nkarta}{220} (█)	.	\Pisymbol{nkarta}{250} (▬)	.	\Pisymbol{smfpr10}{74} (▶)	.
..... 205	 205	 220	
\Pisymbol{nkarta}{221} (●)	.	\Pisymbol{nkarta}{251} (❖)	.	\Pisymbol{smfpr10}{75} (⌚)	.
..... 205	 205	 220	
\Pisymbol{nkarta}{222} (●)	.	\Pisymbol{nkarta}{252} (◐)	.	\Pisymbol{smfpr10}{76} (❖)	.
..... 205	 206	 220	
\Pisymbol{nkarta}{223} (❖)	.	\Pisymbol{nkarta}{253} (▼)	.	\Pisymbol{smfpr10}{77} (▶)	.
..... 205	 206	 220	
\Pisymbol{nkarta}{224} (█)	.	\Pisymbol{nkarta}{254} (►)	.	\Pisymbol{smfpr10}{78} (⌚)	.
..... 205	 206	 221	
\Pisymbol{nkarta}{225} (█)	.	\Pisymbol{smfpr10}{34} ()	220	\Pisymbol{smfpr10}{79} (⌚)	.
..... 205			 221	
\Pisymbol{nkarta}{226} (█)	.	\Pisymbol{smfpr10}{35} (▶)	.	\Pisymbol{smfpr10}{80} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{227} (●)	.	\Pisymbol{smfpr10}{36} (▼)	.	\Pisymbol{smfpr10}{81} (❖)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{228} (★)	.	\Pisymbol{smfpr10}{42} (❖)	.	\Pisymbol{smfpr10}{82} (✚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{229} (★)	.	\Pisymbol{smfpr10}{46} (◑)	.	\Pisymbol{smfpr10}{83} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{230} (○)	.	\Pisymbol{smfpr10}{48} (▼▶)	.	\Pisymbol{smfpr10}{84} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{231} (□)	.	\Pisymbol{smfpr10}{49} (▼◀)	.	\Pisymbol{smfpr10}{85} (❖)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{232} (▽)	.	\Pisymbol{smfpr10}{50} (▼◀▶)	.	\Pisymbol{smfpr10}{86} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{233} (▢)	205	\Pisymbol{smfpr10}{51} (▼◀▶)	.	\Pisymbol{smfpr10}{87} (❖)	.
\Pisymbol{nkarta}{234} (▲)	205 220	 221	
\Pisymbol{nkarta}{235} (◐)	.	\Pisymbol{smfpr10}{52} (▼◀▶)	.	\Pisymbol{smfpr10}{88} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{236} (↓)	.	\Pisymbol{smfpr10}{53} (▼◀▶)	.	\Pisymbol{smfpr10}{89} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{237} (☊)	.	\Pisymbol{smfpr10}{54} (▼◀▶)	.	\Pisymbol{smfpr10}{90} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{238} (☋)	.	\Pisymbol{smfpr10}{55} (▼◀▶)	.	\Pisymbol{smfpr10}{97} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{239} (✳)	.	\Pisymbol{smfpr10}{56} (▼◀▶)	.	\Pisymbol{smfpr10}{98} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{240} (█)	.	\Pisymbol{smfpr10}{57} (▼◀▶)	.	\Pisymbol{smfpr10}{99} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{241} (❖)	.	\Pisymbol{smfpr10}{65} (⌚)	.	\Pisymbol{smfpr10}{100} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{242} (◊)	.	\Pisymbol{smfpr10}{66} (⌚)	.	\Pisymbol{smfpr10}{101} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{243} (✖)	.	\Pisymbol{smfpr10}{67} (⌚)	.	\Pisymbol{smfpr10}{102} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{244} (✚)	.	\Pisymbol{smfpr10}{68} (⌚)	220	\Pisymbol{smfpr10}{103} (⌚)	.
..... 205			 221	
\Pisymbol{nkarta}{245} (†)	.	\Pisymbol{smfpr10}{69} (⌚)	.	\Pisymbol{smfpr10}{104} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{246} (▲)	.	\Pisymbol{smfpr10}{70} (⌚)	.	\Pisymbol{smfpr10}{105} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{247} (❖)	.	\Pisymbol{smfpr10}{71} (⌚)	.	\Pisymbol{smfpr10}{106} (⌚)	.
..... 205	 220	 221	
\Pisymbol{nkarta}{248} (▲)	.	\Pisymbol{smfpr10}{72} (⌚)	.	\Pisymbol{smfpr10}{107} (⌚)	.
..... 205	 220	 221	

\Pisymbol{umranda}{43} (◆)	210	\Pisymbol{umranda}{67} (●)	211	\Pisymbol{umranda}{91} (~~)	211
\Pisymbol{umranda}{44} (■)	210	\Pisymbol{umranda}{68} (○)	210	\Pisymbol{umranda}{92} (⌚)	211
\Pisymbol{umranda}{45} (◇)	210	\Pisymbol{umranda}{69} (🐟)	210	\Pisymbol{umranda}{93} (⌚)	211
\Pisymbol{umranda}{46} (□)	210	\Pisymbol{umranda}{70} (🐠)	210	\Pisymbol{umranda}{94} (▣)	211
\Pisymbol{umranda}{47} (❖)	210	\Pisymbol{umranda}{71} (🐡)	210	\Pisymbol{umranda}{95} (▣)	211
\Pisymbol{umranda}{48} (▣)	210	\Pisymbol{umranda}{72} (●)	210	\Pisymbol{umranda}{96} (▣)	211
\Pisymbol{umranda}{49} (◆)	211	\Pisymbol{umranda}{73} (∞)	210	\Pisymbol{umranda}{97} (▣)	211
\Pisymbol{umranda}{50} (■)	211	\Pisymbol{umranda}{74} (×)	210	\Pisymbol{umranda}{98} (▣)	211
\Pisymbol{umranda}{51} (◇)	211	\Pisymbol{umranda}{75} (○)	210	\Pisymbol{umranda}{99} (▣)	211
\Pisymbol{umranda}{52} (□)	211	\Pisymbol{umranda}{76} (□)	210	\Pisymbol{umranda}{100} (▣)	211
\Pisymbol{umranda}{53} (○)	211	\Pisymbol{umranda}{77} (○)	210	\Pisymbol{umranda}{101} (▣)	211
\Pisymbol{umranda}{54} (○)	211	\Pisymbol{umranda}{78} (✿)	210	\Pisymbol{umrandb}{0} (☰)	211
\Pisymbol{umranda}{55} (○)	211	\Pisymbol{umranda}{79} (✿)	210	\Pisymbol{umrandb}{1} (☰)	211
\Pisymbol{umranda}{56} (○)	211	\Pisymbol{umranda}{80} (✿)	210	\Pisymbol{umrandb}{2} (☰)	211
\Pisymbol{umranda}{57} (□)	211	\Pisymbol{umranda}{81} (✿)	210	\Pisymbol{umrandb}{3} (☰)	211
\Pisymbol{umranda}{58} (□)	211	\Pisymbol{umranda}{82} (✿)	210	\Pisymbol{umrandb}{4} (☷)	211
\Pisymbol{umranda}{59} (□)	211	\Pisymbol{umranda}{83} (✿)	211	\Pisymbol{umrandb}{5} (☷)	211
\Pisymbol{umranda}{60} (□)	211	\Pisymbol{umranda}{84} (✿)	211	\Pisymbol{umrandb}{6} (☷)	211
\Pisymbol{umranda}{61} (☴)	211	\Pisymbol{umranda}{85} (✿)	211	\Pisymbol{umrandb}{7} (☷)	211
\Pisymbol{umranda}{62} (☴)	211	\Pisymbol{umranda}{86} (~~~~)	211	\Pisymbol{umrandb}{8} (☷)	211
\Pisymbol{umranda}{63} (☴)	211	\Pisymbol{umranda}{87} (~~~~)	211	\Pisymbol{umrandb}{9} (☷)	211
\Pisymbol{umranda}{64} (☴)	211	\Pisymbol{umranda}{88} (⌚)	211	\Pisymbol{umrandb}{10} (☷)	212
\Pisymbol{umranda}{65} (🐟)	211	\Pisymbol{umranda}{89} (⌚)	211	\Pisymbol{umrandb}{11} (☷)	212
\Pisymbol{umranda}{66} (🐟)	211	\Pisymbol{umranda}{90} (~~~~)	211	\Pisymbol{umrandb}{12} (☷)	212

\Pisymbol{umrandb}{93} (211	\Pisymbol{umrandb}{119} (212	\Pisymbol{WebOMintsGD}{78}	
.....			(210
\Pisymbol{umrandb}{94} (212	\Pisymbol{umrandb}{120} (212	\Pisymbol{WebOMintsGD}{79}	
.....			(210
\Pisymbol{umrandb}{95} (212	\Pisymbol{umrandb}{121} (212	\Pisymbol{WebOMintsGD}{80}	
.....			(210
\Pisymbol{umrandb}{96} (212	\Pisymbol{umrandb}{122} (212	\Pisymbol{WebOMintsGD}{81}	
.....			(210
\Pisymbol{umrandb}{97} (212	\Pisymbol{umrandb}{123} (212	\Pisymbol{WebOMintsGD}{82}	
.....			(210
\Pisymbol{umrandb}{98} (212	\Pisymbol{WebOMintsGD}{47}		\Pisymbol{WebOMintsGD}{83}	
.....		(209	(210
\Pisymbol{umrandb}{99} (212	\Pisymbol{WebOMintsGD}{48}		\Pisymbol{WebOMintsGD}{84}	
.....		(209	(210
\Pisymbol{umrandb}{100} (212	\Pisymbol{WebOMintsGD}{49}		\Pisymbol{WebOMintsGD}{85}	
.....		(209	(210
\Pisymbol{umrandb}{101} (212	\Pisymbol{WebOMintsGD}{50}		\Pisymbol{WebOMintsGD}{86}	
.....		(209	(210
\Pisymbol{umrandb}{102} (212	\Pisymbol{WebOMintsGD}{51}		\Pisymbol{WebOMintsGD}{87}	
.....		(209	(209
\Pisymbol{umrandb}{103} (212	\Pisymbol{WebOMintsGD}{52}		\Pisymbol{WebOMintsGD}{88}	
.....		(209	(209
\Pisymbol{umrandb}{104} (212	\Pisymbol{WebOMintsGD}{53}		\Pisymbol{WebOMintsGD}{89}	
.....		(209	(209
\Pisymbol{umrandb}{105} (212	\Pisymbol{WebOMintsGD}{54}		\Pisymbol{WebOMintsGD}{90}	
.....		(209	(209
\Pisymbol{umrandb}{106} (212	\Pisymbol{WebOMintsGD}{55}		\Pisymbol{WebOMintsGD}{91}	
.....		(209	(209
\Pisymbol{umrandb}{107} (212	\Pisymbol{WebOMintsGD}{56}		\Pisymbol{WebOMintsGD}{93}	
.....		(209	(209
\Pisymbol{umrandb}{108} (212	\Pisymbol{WebOMintsGD}{57}		\Pisymbol{WebOMintsGD}{97}	
.....		(209	(209
\Pisymbol{umrandb}{109} (212	\Pisymbol{WebOMintsGD}{65}		\Pisymbol{WebOMintsGD}{98}	
.....		(209	(209
\Pisymbol{umrandb}{110} (212	\Pisymbol{WebOMintsGD}{66}		\Pisymbol{WebOMintsGD}{99}	
.....		(209	(209
\Pisymbol{umrandb}{111} (212	\Pisymbol{WebOMintsGD}{67}		\Pisymbol{WebOMintsGD}{100}	
.....		(209	(209
\Pisymbol{umrandb}{112} (212	\Pisymbol{WebOMintsGD}{68}		\Pisymbol{WebOMintsGD}{101}	
.....		(209	(209
\Pisymbol{umrandb}{113} (212	\Pisymbol{WebOMintsGD}{69}		\Pisymbol{WebOMintsGD}{102}	
.....		(209	(209
\Pisymbol{umrandb}{114} (212	\Pisymbol{WebOMintsGD}{70}		\Pisymbol{WebOMintsGD}{103}	
.....		(209	(209
\Pisymbol{umrandb}{115} (212	\Pisymbol{WebOMintsGD}{71}		\Pisymbol{WebOMintsGD}{104}	
.....		(209	(209
\Pisymbol{umrandb}{116} (212	\Pisymbol{WebOMintsGD}{72}		\Pisymbol{WebOMintsGD}{105}	
.....		(209	(209
\Pisymbol{umrandb}{117} (212	\Pisymbol{WebOMintsGD}{73}		\Pisymbol{WebOMintsGD}{106}	
.....		(209	(209
\Pisymbol{umrandb}{118} (212	\Pisymbol{WebOMintsGD}{74}		\Pisymbol{WebOMintsGD}{107}	
.....		(209	(209
		\Pisymbol{WebOMintsGD}{75}		\Pisymbol{WebOMintsGD}{108}	
		(209	(209
		\Pisymbol{WebOMintsGD}{76}		\Pisymbol{WebOMintsGD}{109}	
		(210	(209
		\Pisymbol{WebOMintsGD}{77}		\Pisymbol{WebOMintsGD}{110}	
		(210		

\Pisymbol{WebOMintsGD}{111}	
(⌚)	209
\Pisymbol{WebOMintsGD}{112}	
(⌚)	209
\Pisymbol{WebOMintsGD}{113}	
(⌚)	210
\Pisymbol{WebOMintsGD}{114}	
(⌚)	210
\Pisymbol{WebOMintsGD}{115}	
(⌚)	210
\Pisymbol{WebOMintsGD}{116}	
(⌚)	210
\Pisymbol{WebOMintsGD}{117}	
(⌚)	210
\Pisymbol{WebOMintsGD}{118}	
(⌚)	210
\Pisymbol{WebOMintsGD}{119}	
(⌚)	210
\Pisymbol{WebOMintsGD}{120}	
(⌚)	210
\Pisymbol{WebOMintsGD}{121}	
(⌚)	210
\Pisymbol{WebOMintsGD}{122}	
(⌚)	210
\pitchfork (⊤)	124
\pitchfork (⊤)	52
\pitchfork (⊤)	60
\pitchfork (⊤)	95
\pitchfork (⊤)	93
\pitchfork (⊤)	61
pitchforks .	52, 93, 95, 118, 124
Pitman's base 12 symbols	122, 185
\piup (π)	98
\planck (h)	20
\Plane (✈)	152
planets .	131–133, 206–209
\plasmon (↔)	138
playing cards .	151
Plimsoll line .	231
\Plus (⊕)	143
\plus (+)	162
\plus (+)	34
\plus (+)	34
plus-or-minus sign .	see \pm
\PlusCenterOpen (⊕)	143
\pluscirc (⊕)	33
\pluscirc (⊕)	35
\plusdot (+)	34
\plusdot (+)	36
\pluseqq (±)	36
\plushat (†)	36
\PlusOutline (⊕)	143
plusses .	143, 204–206
\plussim (±)	36
\plussubtwo (‡)	36
\PlusThinCenterOpen (⊕)	143
\plustrif (+)	35
\plustrif (+)	36
\Pluto (♃)	132
\Pluto (♄)	132
\Pluto (♅)	133
\pluto (♃)	131
\pm (±)	31
\pm (±)	35
\pm (±)	34
\pm (±)	34
\pm (±)	36
\pm (±)	188
\pmb .	241
\pmbboxdraw (package)	190, 247, 248
\pmod .	96
\pod .	96
\pointer (◊)	181
pointing finger .	see fists
\PointingHand (☞)	182
\pointint (◊)	49
\pointintsl (◊)	51
\pointintup (◊)	51
\pointright (☞)	142
\Poland (🇵🇱)	194
\polariton (☒)	138
\polaron (߱߳)	138
\polishhook („)	25
\polter (██████)	119
polotonikogreek (babel package option) .	16, 97, 98
polygons .	146–149, 173–178, 204–206, 222
\polynom (package)	112
polynomial division .	112
polytonic Greek .	16, 97, 98
\portato (˘)	168
\portatoDown (˘)	168
\Portugal (🇵🇹)	194
\Poseidon (*X)	133
\positron (e ⁺)	138
\postalmark (〒)	126
\Postbox (✉)	192
PostScript .	98, 129, 139, 229, 239
PostScript fonts .	139
\pot (࠵)	196
\Pound (💷)	26
\pounds .	15
\pounds (£)	242, 243
power set .	see alphabets, math
\powerset (℘)	100
\Pp (:)	188
\pp (:)	188
\ppm („)	188
\Ppp (:)	188
\ppp (:)	188
\Pppp (⋮)	188
\pppp (⋮)	188
\Ppppp (⋮)	188
\ppppp (⋮)	188
\Pr (Pr)	96
\Prec (≪)	61
\prec (≺)	52
\prec (≺)	58
\prec (≺)	55
\prec (≺)	61
\precapprox (≾)	54
\precapprox (≿)	52
\precapprox (≿)	60
\precapprox (≿)	58
\precapprox (≿)	55
\precapprox (≿)	61
\preccurlyeq (≾)	54
\preccurlyeq (≿)	52
\preccurlyeq (≾)	60
\preccurlyeq (≿)	58
\preccurlyeq (≾)	55
\preccurlyeq (≿)	55
\preccurlyeq (≾)	61
\preccurlyeq (≿)	54
\preccurlyeq (≾)	52
\preccurlyeq (≾)	60
\preccurlyeq (≾)	58
\preccurlyeq (≾)	55
\preccurlyeq (≾)	61
\preccurlyeq (≾)	54
\preccurlyeq (≾)	53
\preccurlyeq (≾)	58
\preccurlyeq (≾)	61
\precnapprox (≿)	54
\precnapprox (≿)	53
\precnapprox (≿)	60
\precnapprox (≿)	58
\precnapprox (≿)	57
\precnapprox (≿)	62
\precneq (≾)	54
\precneq (≾)	58, 59
\precneq (≾)	62
\precneqq (≿)	53
\precneqq (≿)	60
\precneqq (≿)	58, 59
\precneqq (≿)	62
\precnsim (≿)	54
\precnsim (≿)	53
\precnsim (≿)	60
\precnsim (≿)	58
\precnsim (≿)	57
\precnsim (≿)	62
\precsim (≾)	54
\precsim (≾)	52
\precsim (≾)	60
\precsim (≾)	58
\precsim (≾)	55
\precsim (≾)	62
prescription .	see \textrecipie
present-value symbols .	116, 235
\prime (')	124
\prime (')	125
\prime (')	125
\prime (')	122

primes	122, 124, 125
\Printer (✉)	134
printer's fist	<i>see</i> fists
printer's flowers	<i>see</i> fleurons and flowers
probabilistic independence	232
probability limit (plim)	<i>see</i> $n \rightarrow \infty$
\DeclareMathOperator	
\prod (\prod)	42
\prod (\prod)	47
\prod (\prod)	47
\prod (\prod)	49
\PRODI	52
\PRODI (\prod)	52
\Prodi	52
\Prodi (\prod)	52
\prodi	52
\prodi (\prod)	52
prodint (package)	52, 247
product integrals	52
\proffline (\curvearrowright)	126
\profssurf (\curvearrowleft)	126
Project Gutenberg	229
projective space (\mathbb{P})	<i>see</i> alphabets, math
\projlim (proj lim)	96
pronunciation symbols	<i>see</i> phonetic symbols
proof, end of	124
proper subset/superset	<i>see</i> \subsetneq/\supsetneq
proper vertices	137
\PropertyLine (¶)	126
\propfrom (\bowtie)	58
\proto (\propto)	124
\proto (\propto)	52
\proto (\propto)	58
\proto (\propto)	56
\proto (\propto)	62
\protein (¶)	137
proto-Semitic symbols	153
\proton (p^*)	137
protosem (package)	153, 247
\ProvidesPackage	246
\PrSc (¶)	134
\prurel (\rightsquigarrow)	60
\prurel (\rightsquigarrow)	62
\ps (\leftrightharpoons)	188
pseudographics	190
\Psi (Ψ)	97
\psi (ψ)	97
\psiup (ψ)	98
psnfss (package)	144
PSTricks (package)	198
\Psyche (Ψ)	133
\Pu (.)	165
\pullback (\lrcorner)	34
\pullback (\lrcorner)	62
pullback diagrams	233
pulse diagram symbols	130
\PulseHigh ($\lceil \rceil$)	130
\PulseLow ($\lfloor \rfloor$)	130
\pumpkin (✉)	40
pumpkins	40
punctuation	17
punctum	<i>see</i> musixgre
\Purierstab (!)	196
\pushout (\square)	34
\pushout (\square)	62
pushout diagrams	233
\pwedge (Λ)	20
\pxfonts (package)	30, 32, 44, 53, 54, 65, 68, 76, 95, 98–100, 124, 128, 151, 226, 242
\Pxp (:)	188
\pxp (:)	188
Q	
Q.E.D.	124
\QED (■)	126
\Qoppa (Q)	159
\qoppa (ϱ)	159
\qoppa (↳)	159
\qp (f)	164
\qprime (m)	122
\QQ (M)	134
\qqs (f)	164
\qs (f)	164
\qside (⟨)⟩	186
\quaddot (:)	162
\quadeye (^)	162
\Quadrad ()	110
\quadrad (I)	110
\Quadras ()	110
\quadras (I)	110
\quadrupole (%)	137
\quark (q)	137
\quarkb (b)	137
\quarkc (c)	137
\quarkd (d)	137
\quarks (s)	137
\quarkt (t)	137
\quarku (u)	137
quarter note	<i>see</i> musical symbols
\quarterNote (♩)	166
\quaternote (♩)	163
\quaternote (♩)	163
\quaternote (♩)	163
\quarterNoteDotted (♩)	166
\quarterNoteDottedDouble (♩..)	166
\quarterNoteDottedDoubleDown (♩..)	166
\quarterNoteDottedDown (♩)	166
quasi-quotation marks („“)	<i>see</i> \ulcorner and \urcorner
quaternions (H)	<i>see</i> alphabets, math
quaver	<i>see</i> musical symbols
\quaver (♪)	166
\quaverDotted (♪.)	166
\quaverDottedDouble (♪..)	166
\quaverDottedDoubleDown (♪..)	166
\quaverDottedDown (♪..)	166
\quaverDown (♪)	166
\quaverRest (♪)	168
\quaverRestDotted (♪..)	168
queen	187, 224–226
\questeq (=)	62
\Question (??)	126
quisma	<i>see</i> musixgre
\Quincunx (K)	133
Quine corners („“)	<i>see</i> \ulcorner and \urcorner
quotation marks	14, 17, 28, 196, 241, 244
\quotedblbase („)	17, 244
\quotesinglbase (‘)	17, 244
R	
\R (Υ)	162
\R (λ)	162
\R (~)	188
\r (⌚)	21
\r (~)	188
r (R)	162
r (ε)	128
\Radiation (⌚⌚)	183
\radiation (⌚)	196
radicals	<i>see</i> \sqrt and \surd
\Radioactivity (☢)	136
\Radix (R ^{ad})	133
\Rain (丝丝)	183
\RainCloud (丝丝)	183
raindrop	224
raising	<i>see</i> \textraising
\RaisingEdge (↑)	130
\Rangle (>)	129
\rAngle (⟨)⟩	109
\rAngle (⟨)⟩	106
\rAngle (⟨)⟩	108

\rangle	30, 103
\rangle	106
\rangle	105
\rangle	108
\rangle	105
\rangle	106
\rangle	103
\rangle	123
\Rrightarrow	134
\arrowfill	117
\ratio	64
\RATIONAL	96
\Rational	96
rational numbers	(\mathbb{Q}) see alphabets, math
rationalized Planck constant	see \hbar
\RB	134
\Rbag	102
\rbag	102
\rbag	35
\rbag	103
\rblackbowtie	(\bowtie) 35
\rlblkbrbrak	(\parallel) 103
\rBrace	($\left\{ \right\}$) 108
\rbrace	106
\rbrace	107
\rbrace	105
\rbrace	108
\Rbrack	($\right\} \right]$) 129
\rBrack	($\right\} \right]$) 109
\rBrack	($\right\} \right]$) 106
\rBrack	($\right\} \right]$) 107
\rBrack	($\right\} \right]$) 108
\rbrack) 106
\rbrack) 107
\rbracklrtick	($\right\} \right]$) 103
\rbrackubar	($\right\} \right]$) 103
\rbrackurtick	($\right\} \right]$) 103
\Rbrbrak	($\right\} \right]$) 103
\rbrbrak) 108
\rc	(\square) 23
\rCeil	($\lceil \rceil$) 109
\rceil	(\lceil) 103
\rceil) 106
\rceil) 105
\rceil) 107
\rcirclearrowdown	(\circlearrowleft) 78
\rcirclearrowleft	(\circlearrowleft) 78
\rcirclearrowright	(\circlearrowright) 78
\rcirclearrowup	(\circlearrowup) 78
\rcircleleftint	(\oint) 47, 48
\rcircleleftint	(\oint) 47
\rcirclerightint	(\oint) 47, 48
\rcirclerightint	(\oint) 47
\rcorners	(\curvearrowright) 102
\rcurvaturedown	(\curvearrowleft) 78
\rcurvatureleft	(\curvearrowleft) 78
\rcurvatureone	(\curvearrowright) 78
\rcurvaturenw	(\curvearrowleft) 78
\rcurvatureright	(\curvearrowright) 78
\rcurvaturese	(\curvearrowleft) 78
\rcurvaturesw	(\curvearrowleft) 78
\rcurvatureup	(\curvearrowright) 78
\rcurvyangle	(\curvearrowright) 103
\rdbrack	($\right] \right]$) 104
\rdiagovfdiag	($\diagup \diagdown$) 126
\rdiagovsearrow	($\diagup \diagdown$) 88
\Rdsh	($\downarrow \downarrow$) 82
\Rdsh	($\downarrow \downarrow$) 88
\Re	(\Re) 100
\Re	(\Re) 101
\REAL	(\mathbb{R}) 96
\Real	(\mathbb{R}) 96
real numbers	(\mathbb{R}) see alphabets, math
recipe	see \textrecipe
\recorder	(\circlearrowleft) 181
\Rectangle	(\blacksquare) 150
\RectangleBold	(\blacksquare) 150
rectangles	150, 173–178, 204–206
\RectangleThin	(\blacksquare) 150
\Rectpipe	(\blacksquare) 136
\Rectsteel	(\blacksquare) 136
recycle	(package) 192, 247
\recycle	(\oplus) 196
\recycle	(\oplus) 192
\Recycling	(\oplus) 192
recycling symbols	192, 196–202, 204
reduced quadrupole moment	see \rqm
\reference	(R) 137
\reflectbox	229, 230
registered trademark	14, 27, 243
\Reibe	(\blacksquare) 196
relational database symbols	126
relational symbols	52
binary	52–57, 60–72, 93–95
negated binary	53, 54, 56–57, 59, 60, 62
triangle	72–74
\relationleftproject	(\square) 118
\relationlifting	(\square) 118
\relationrightproject	(\square) 118
relations	118
\Relbar	($=$) 95, 230
\Relbar	($=$) 56
\Relbar	(\equiv) 96
\relbar	($-$) 95, 230
\relbar	($-$) 56
\relbar	($-$) 96
\relsize	(package) 24
\Request	(\mathfrak{R}) 192
\resistivity	(\mathfrak{R}) 137
\resizebox	91, 226
\Respondens	(\sim) 188
\respondens	(\sim) 188
response	(\mathfrak{R}) 245, 246
\restoresymbol	226
\restrictbarb	(\downarrow) 92
\restrictbarbup	(\uparrow) 92
\restriction	(\uparrow) 76
\restriction	(\uparrow) 85
\restriction	(\uparrow) 80
\restriction	(\uparrow) 91
restrictions	76, 80, 81, 85, 90–92
\restrictmallet	(\downarrow) 92
\restrictmalletup	(\uparrow) 92
\restrictwand	(\downarrow) 92
\restrictwandup	(\uparrow) 92
rests	see musical symbols
retracting	see \textretracting
\Retrograde	(\mathfrak{R}_x) 133
\Return	(\leftrightarrow) 134
return	see carriage return
\revangle	(Δ) 123
\revangle	(Δ) 123
\revangleubar	(Δ) 123
\revaw	($\{\}$) 108
\revD	(\mathbb{D}) 20
\revddots	(\cdots) 234
\reve	(\circ) 19

\reveject (s)	19	\rhookleftarrow (↔)	78	\rightarrowtriangle (→)	86
\revemptyset (∅)	125	\rhooknearrow (↗)	83	\rightarrowtriangle (→)	88
\revemptyset (∅)	123	\rhooknearrow (↗)	78	\rightarrowx (↔)	88
\revepsilon (ε)	19	\rhooknwarrow (↖)	82	\rightAssert (⊤)	58
\revepsilon (ε)	229	\rhooknwarrow (↖)	78	\rightassert (⊣)	58
reverse solidus	<i>see</i> \textbackslash	\rhookrightarrow (→)	82	\rightbarharpoon (⇒)	77
\reverseallabreve (Φ)	164	\rhookrightarrow (→)	78	\rightbkarrow (⤠)	82
\reverseC (C)	164	\rhooksearrow (↘)	82	\rightbkarrow (⤠)	88
reversed symbols	229–230	\rhooksearrow (↘)	78	\rightblackarrow (⤡)	86
\reversedvideobend (⤢)	181	\rhookswarrow (↙)	82	\rightblackspoon (⤣)	94
\reversedmathcloud (⤢)	40	\rhookswarrow (↙)	77	\RIGHTCIRCLE (⦿)	146
\reversedmathwitch (⤢)	40	\rhookuparrow (↑)	82	\RIGHTcircle (⦿)	146
\reversedmathwitch* (⤢)	40	\rhookuparrow (↑)	77	\Rightcircle (⦿)	146
\revglotstop (⌚)	19	\rhoup (ρ)	98	\rightcurvedarrow (↝)	82
\revmeasuredangle (Δ)	123	\right (103, 104, 108, 109, 226,	228	\rightcurvedarrow (↝)	88
\revnmid (⊄)	62	\rightangle (∟)	123	\rightdasharrow (⤠)	86
\revsphericalangle (▷)	123	\rightangle (∟)	123	\rightdasharrow (⤠)	88
\Rewind (◀)	182	\rightangle (∟)	127	\rightdbltail (⤠)	62
\RewindToIndex (◀◀)	182	\rightangle (∟)	123	\RightDiamond (◆)	150
\RewindToStart (◀)	182	\rightangledot (¤)	123	\rightdotarrow (⤠)	88
\rbowtie (⋈)	62	\rightangledot (¤)	123	\rightdowncurvedarrow (⤢)	82
\rfilet (⤢)	104	\rightangledot (¤)	123	\rightdowncurvedarrow (⤢)	88
\rfloor (⌋)	109	\rightanglesqr (¤)	123	\rightevaw (⤢)	108
\rfloor (⌋)	103	\rightanglesqr (¤)	123	\rightfilledspoon (⤠)	93
\rfloor (⌋)	106	\rightanglesquare (¤)	123	\rightfishtail (⤠)	61
\rfloor (⌋)	105	\RIGHTRarrow (▶)	181	\rightfootline (⤠)	58
\rfloor (⌋)	107	\Rightarrow (⇒)	30, 75	\rightfootline (⤠)	55
\rftimes (✖)	62	\Rightarrow (⇒)	82	\rightfree (⤠)	55
\rgroup ()}	104	\Rightarrow (⇒)	77	\righthalfcap (⤠)	34
		\Rightarrow (⇒)	88	\righthalfcup (⤠)	34
\rgroup ()}	106	\rightarrow (→)	76	\righthand (⤠)	142
\rgroup ()}	105	\rightarrow (→)	75	\rightharpoonaccent (⤠)	111
\rgroup ()}	107	\rightarrow (→)	82	\rightharpoonccw (⤠)	80
\rftimes (✖)	62	\rightarrow (→)	77	\rightharpooncw (⤠)	80
\rightarrow (→)	92	\rightarrow (→)	92	\rightharpoondown (⤠)	77
\rightarrow (→)	88	\rightarrow (→)	88	\rightharpoondown (⤠)	75
\rightarrowapprox (↝)	88	\rightarrowapprox (↝)	88	\rightharpoondown (⤠)	87
\rightarrowbackapprox (⤝)	88	\rightarrowbackapprox (⤝)	88	\rightharpoondown (⤠)	85
\rightarrowbar (⤠)	86	\rightarrowbar (⤠)	88	\rightharpoondown (⤠)	90
\rightarrowbar (⤠)	88	\rightarrowbar (⤠)	88	\rightharpoondownbar (⤠)	90
\rightarrowbsimilar (⤝)	88	\rightarrowbsimilar (⤝)	88	\rightharpoonsupdown (⇒)	90
\rightarrowcircle (⤠)	86	\rightarrowcircle (⤠)	86	\rightharpoonup (⤠)	77
\rightarrowdiamond (⤠)	88	\rightarrowdiamond (⤠)	88	\rightharpoonup (⤠)	75
\rightarrowgtr (⤠)	72	\rightarrowgtr (⤠)	72	\rightharpoonup (⤠)	87
\rightarrowonoplus (⊕)	88	\rightarrowonoplus (⊕)	88	\rightharpoonup (⤠)	85
\rightarrowplus (⤠)	88	\rightarrowplus (⤠)	88	\rightharpoonup (⤠)	90
\rightarrowshortleftarrow (⤠)	88	\rightarrowshortleftarrow (⤠)	88	\rightharpoonupbar (⤠)	90
\rightarrowsimilar (⤝)	88	\rightarrowsimilar (⤝)	88	\rightharpoonupdash (⇒)	90
\rightarrowsupset (⤠)	67	\rightarrowsupset (⤠)	67	\rightimply (⇒)	61
\rightarrowtail (⤠)	75	\rightarrowtail (⤠)	75	\rightlcurvearrow (⤠)	82
\rightarrowtail (⤠)	86	\rightarrowtail (⤠)	86	\rightleftarrows (⤠)	76
\rightarrowtail (⤠)	82	\rightarrowtail (⤠)	82	\rightleftarrows (⤠)	75
\rightarrowtail (⤠)	77	\rightarrowtail (⤠)	77	\rightleftarrows (⤠)	86
\rightarrowtail (⤠)	88	\rightarrowtail (⤠)	88	\rightleftarrows (⤠)	82
\rightarrowTriangle (⤠)	86	\rightarrowTriangle (⤠)	86	\rightleftarrows (⤠)	77
\rightarrowtriangle (⤠)	76	\rightarrowtriangle (⤠)	76	\rightleftarrows (⤠)	88

\rightleftharpoon (\rightarrow)	77
\rightleftharpoons (\rightleftharpoons)	77
\rightleftharpoons (\rightleftharpoons)	76
\rightleftharpoons (\rightleftharpoons)	75
\rightleftharpoons (\rightleftharpoons)	87
\rightleftharpoons (\rightleftharpoons)	85
\rightleftharpoons (\rightleftharpoons)	80
\rightleftharpoons (\rightleftharpoons)	90
\rightleftharpoonsdown (\rightleftharpoons)	90
\rightleftharpoonsfill	117
\rightleftharpoonsup ($=$)	90
\rightleftstquigarrow (\leftrightarrow)	82
\rightlsquigarrow (\rightsquigarrow)	82
\rightlsquigarrow (\rightsquigarrow)	77
\Rightmapsto (\Rightarrow)	82
\Rightmapsto (\Rightarrow)	82
\Rightmapsto (\Rightarrow)	77
\rightModels (\Vdash)	55
\rightmodels (\Vdash)	57
\rightmodels (\Vdash)	55
\rightmoon (\mho)	132
\rightmoon (\mho)	132
\rightmoon (\mho)	131
\rightouterjoin (\bowtie)	126
\righttp (\circlearrowright)	25
\rightpentagon (\lozenge)	149
\rightpentagonblack (\blacksquare)	149
\rightpitchfork (\ni)	95
\rightpitchfork (\ni)	93
\rightpointleft ($\overleftarrow{\wedge}$)	142
\rightpointright ($\overrightarrow{\wedge}$)	142
\rightproto (\bowtie)	55
\rightrcurvarrow (\curvearrowright)	82
\rightrightarrows ($\rightarrow\rightarrow$)	76
\rightrightarrows ($\rightarrow\rightarrow$)	75
\rightrightarrows ($\rightarrow\rightarrow$)	86
\rightrightarrows ($\rightarrow\rightarrow$)	81
\rightrightarrows ($\rightarrow\rightarrow$)	77
\rightrightarrows ($\rightarrow\rightarrow$)	88
\rightrightharpoons (\rightleftharpoons)	77
\rightrsquigarrow (\rightsquigarrow)	82
\rightrsquigarrow (\rightsquigarrow)	77
\RightScissors (\triangleright)	141
\rightslice (\triangleright)	32
\rightslice (\triangleright)	35
\rightslice (\triangleright)	55
\rightspoon (\leftrightharpoonup)	94
\rightspoon (\leftrightharpoonup)	93
\rightsquigarrow (\rightsquigarrow)	76
\rightsquigarrow (\rightsquigarrow)	75
\rightsquigarrow (\rightsquigarrow)	86
\rightsquigarrow (\rightsquigarrow)	82
\rightsquigarrow (\rightsquigarrow)	78
\rightsquigarrow (\rightsquigarrow)	88, 89
\rightt (\vdash)	25
\righttail (\vdash)	61
\righttherefore ($::$)	120
\righttherefore ($::$)	33, 120
\rightthreearrows ($\exists\exists\exists$)	86
\rightthreearrows ($\exists\exists\exists$)	88
\rightthreetimes ($\wedge\wedge\wedge$)	124
\rightthreetimes ($\wedge\wedge\wedge$)	31
\rightthreetimes ($\wedge\wedge\wedge$)	35
\rightthreetimes ($\wedge\wedge\wedge$)	34
\rightthreetimes ($\wedge\wedge\wedge$)	33
\rightthreetimes ($\wedge\wedge\wedge$)	36
\rightthumbsdown ($\overline{\text{I}}$)	142
\rightthumbsup ($\overline{\text{I}}$)	142
\righttoleftarrow (\curvearrowleft)	76
\righttoleftarrow (\curvearrowleft)	86
\Righttorque (Q)	136
\rightturn (\circlearrowright)	181
\rightupcurvedarrow (\curvearrowright)	82
\rightVDash (\Vdash)	57
\rightVdash (\Vdash)	57
\rightVdash (\Vdash)	55
\rightvDash (\Vdash)	57
\rightvdash (\vdash)	57
\rightvdash (\vdash)	55
\rightwave (\smile)	108
\rightwavearrow (\rightsquigarrow)	81
\rightwavearrow (\rightsquigarrow)	88
\rightwhitearrow (\Rightarrow)	86
\rightwhitearrow (\Rightarrow)	88
\rightwhiteroundarrow (\Rightarrow)	86
\rightY (\rightarrow)	34
\rightY (\rightarrow)	33
\rinforzando ()	168
\ring (\textcircledcirc)	112
ring (\textcircledcirc)	see accents
ring equal to	see \circeq
ring in equal to	see \eqcirc
\ringplus (\ddagger)	36
\riota (\textcirclediota)	125
\riota (\textcirclediota)	20
\rip (\pm)	186
\risingdotseq (\rightleftharpoons)	54
\risingdotseq (\rightleftharpoons)	52
\risingdotseq (\rightleftharpoons)	60
\risingdotseq (\rightleftharpoons)	57
\risingdotseq (\rightleftharpoons)	55
\risingdotseq (\rightleftharpoons)	61
\rJoin (\bowtie)	53
\rJoin (\bowtie)	35
\RK (\dashv)	134
\rlap	25, 150, 233
\rmoustache ()	104
\rmoustache ()	107
\rmoustache ()	105
\rmoustache ()	107
\rmoustache ()	107
\Rho (ρ)	134
rock/paper/scissors	142
\rollingpin ($\square\!\square\!\square$)	196
Roman coins	27
\Romania (\bullet)	194
Romanian comma-belo accent (,)	see accents
rook	187, 224–226
roots	see \sqrt
roshambo	142
\rotatebox	24, 229, 230
rotated symbols	17–20, 24, 229–230
rotating (package)	28, 134
\rotm ($\text{u}\!\text{u}$)	20
\rotOmega (o)	20
\rotr (l)	20
\rotvara (v)	20
\rotw (w)	20
\roty (A)	20
\RoundedLsteel (L)	136
\RoundedLsteel (L)	136
\RoundedTsteel (T)	136
\RoundedTsteel (T)	136
\RoundedTTsteel (I)	136
\Rparen ()	129
\rParen ()	107
\rparen ()	106
\rparen ()	107
\rparengtr ()	103
\Rparenless ()	103
\rppolint ()	49
\rppolintsl ()	50
\rppolintup ()	50
\rqm (I)	232
\RR ()	162
\rrangle ()	105
\rrangle ()	103
\rrbracket ()	104
\rrbracket ()	109
\rrceil ()	102
\RRelbar ()	96
\Rrelbar ()	96
\rrfloor ()	102
\rrhD ()	203
\rrhDa ()	203
\rrhDap ()	203
\rrhDp ()	203
\rrhDs ()	203
\rrhDsp ()	203
\rrhDw ()	203

\rrhDwp (☒)	203
\rrhE (☒)	203
\rrhEp (☒)	203
\rrhF (☒)	203
\rrhFp (☒)	203
\rrhFw (☒)	203
\rrhFwp (☒)	203
\rrhL (☒)	203
\rrhLa (☒↑)	203
\rrhLap (↑☒)	203
\rrhLp (☒☒)	203
\rrhLs (☒↓)	203
\rrhLsp (↑☒↑)	203
\rrhLw (☒☒)	203
\rrhLwp (☒☒)	203
\rrhM (☒)	203
\rrhMp (☒↑)	203
\rrhR (☒↑)	203
\rrhRa (☒↑)	203
\rrhRap (↑☒)	203
\rrhRp (☒☒)	203
\rrhRs (☒↑)	203
\rrhRsp (☒↓)	203
\rrhRw (☒☒)	203
\rrhRwp (☒☒)	203
\rrhSd (☒)	203
\rrhSdp (☒)	203
\rrhSl (☒)	203
\rrhSlp (☒↑)	203
\rrhSr (☒↑)	203
\rrhSrp (☒↓)	203
\rrhSu (☒)	203
\rrhSup (☒)	203
\rrhU (☒)	203
\rrhUa (☒)	203
\rrhUap (☒)	203
\rrhUp (☒)	203
\rrhUs (☒)	203
\rrhUsp (☒)	203
\rrhUw (☒)	203
\rrhUwp (☒)	203
\RRRightarrow (⤒)	88
\Rrightarrow (⤒)	76
\Rrightarrow (⤒)	86
\Rrightarrow (⤒)	81
\Rrightarrow (⤒)	77
\Rrightarrow (⤒)	88
\rrparenthesis ()	102
\rrparenthesis ()	103
\RS (▲)	135
\rsem (☒)	107
\rsem (☒)	105
\rsemantic	<i>see \rdbrack</i>
\rsfs (emf package option)	131
\rsfso (package)	128, 247
\Rsh (⤔)	76
\Rsh (⤔)	75
\Rsh (⤔)	86
\Rsh (⤔)	81
\Rsh (⤔)	77
\Rsh (⤔)	88
\rsolbar (⤁)	36
\rsqhook (⤂)	61
\rsub (⤃)	40
\rtborder (⤄)	188
\rtbotcorner (⤄)	188
\rtimes (⤆)	33
\rtimes (⤆)	31
\rtimes (⤆)	35
\rtimes (⤆)	34, 35
\rtimes (⤆)	33
\rtimes (⤆)	36
\rtimesblack (⤆)	35
\rtriltri (⤆)	74
\rtriple	109
\rttopcorner (⤄)	188
\RU (⌚)	134
Rubik's Cube	203
rubikcube (package)	203, 247, 248
\ruledelayed (⤇)	61
runes	162
Anglo-Frisian	162
Danish	<i>see</i> normal runes
Germanic	162
Hälsinge	<i>see</i> staveless runes
long-branch	<i>see</i> normal runes
medieval	162
normal	162
short-twigs	162
staveless	162
Swedo-Norwegian	<i>see</i> short-twigs runes
\rupee (₹)	27
\RV (⌚)	134
\rVert ()	109
\rVert ()	104
\rVert ()	106
\rvert ()	104
\rvert ()	106
\rvvert ()	106
\Rzigzag (☒)	103
\rvzigzag (☒)	103
\rWalley (☒)	196
\rwave (⤈)	108
\rWavy (⤉)	105
\rwavey (⤉)	105
S	
\S {}	162
\S {}	15, 243
\S {}	15
\s {}	162
\s {}	162
\sA (⤊)	193
\SAa (⤋)	159
\SAb (⤌)	159
\SAd (⤍)	159
\SAdb (⤎)	159
\SAdd (⤏)	159
\Sadey (⤐)	196
\sadface (⤐)	196
\SAf (⤑)	159
safety-related symbols	136
\Saftpresse (⤒)	196
\SAg (⤓)	159
\SAGa (⤔)	159
\Sagittarius (⤖)	133
\Sagittarius (⤗)	132
\sagittarius (⤘)	131
\SAh (⤙)	159
\SAhd (⤚)	159
\SAhu (⤛)	159
\SAk (⤜)	159
\SAI (⤝)	159
\SAlq (⤞)	159
\SAM (⤟)	159
\samebishops (⤠)	186
\Sampi (⤡)	159
\Sampi (⤢)	159
\sampi (⤣)	159
\sampi (⤤)	159
\SAN (⤥)	159
sans (dsfont package option)	128
\sansLmirrored (⤦)	126
\sansLturned (⤧)	126
\SAo (⤧)	159

\Sappho (♀)	133
\SAq (◊)	159
\SAr (▷)	159
\sarabfamily	159
sarabian (package)	159, 247, 248
\SAs (⊗)	159
\SAsa (⊗)	159
\SAsd (⊗)	159
\SAsv (↶)	159
\SAT (X)	159
\SATb (⊗)	159
\SATd (III)	159
\satellitedish (⌚)	152
satisfies	see \models
\Saturn (⌚)	132
\Saturn (⌚)	133
\Saturn (⌚)	132
\saturn (⌚)	131
savesym (package)	226
\savesymbol	226
\SAw (◊)	159
\SAy (ⓘ)	159
\SAz (⊗)	159
\SAzd (⊗)	159
\Sborder (☒)	152
\scalebox	226
scaled (CountriesOfEurope package option)	195
scaling	236, 239
mechanical	236, 239
optical	236
\scd (D)	19
\scg (G)	19
\Schaler (⌚)	196
\Schneebesen (⌚)	196
\Schussel (⌚)	196
\schwa (ə)	20
\schwa (ə)	19
Schwartz distribution spaces	see alphabets, math
\sci (ⓘ)	19
scientific symbols	130–138, 222
\ScissorHollowLeft (⌚)	141
\ScissorHollowRight (⌚)	141
\ScissorLeft (⌚)	141
\ScissorLeftBrokenBottom (⌚)	141
\ScissorLeftBrokenTop (⌚)	141
\ScissorRight (⌚)	141
\ScissorRightBrokenBottom (⌚)	141
\ScissorRightBrokenTop (⌚)	141
scissors	141, 199–202
\scn (N)	19
\scoh (↷)	64
\Scorpio (♏)	133
\Scorpio (♏)	132
\scorpio (♏)	131
\scpolint (⌚)	49
\scpolintsl (⌚)	50
\scpolintup (⌚)	50
scr (rsfso package option)	128
\scr (R)	19
script letters	see alphabets, math
\scripta (a)	19
\scriptg (g)	19
\scriptscriptstyle	232
\scriptstyle	232
\scriptv (v)	19
\Scroll (ScrollIndicator)	134
\scu (U)	19
\scurel (↷)	60
\scurel (↷)	61
\scy (Y)	19
\sddtstile (☱)	63
\sDep (⌘)	164
\sdststile (☱)	63
\sdtstile (☱)	63
\sdttstile (☱)	63
seagull	see \textseagull
\Searrow (⤒)	76
\Searrow (⤒)	86
\Searrow (⤒)	81
\Searrow (⤒)	77
\Searrow (⤒)	88
\searrow (⤒)	76
\searrow (⤒)	75, 233
\searrow (⤒)	81
\searrow (⤒)	77
\searrow (⤒)	92
\searrow (⤒)	88
\searrowtail (⤒)	81
\searrowtail (⤒)	77
\sebkarrown (⤒)	81
\sec (sec)	96
\Sech (♪)	165
\SechBL (♩)	165
\SechBl (♩)	165
\SechBR (♪)	165
\SechBr (♪)	165
\second (〃)	124
seconds, angular	see \second
\secstress (ⓘ)	25
section mark	see \S
\SectioningDiamond (❖)	183
\sector (▽)	125
sedenions (\$)	see alphabets, math
\sefilledspoon (⤒)	93
\sefootline (⤒)	55
\sefree (⤒)	55
segmented numerals	130
	164
	164
\segno (⌚)	164
\seharpoonccw (⤒)	80
\seharpooncw (⤒)	80
\seharpoonne (⤒)	85
\seharpoonsw (⤒)	85
\seight (⌚)	162
\selcurvearrow (⤒)	82
\selectfont	12
\selsquigarrow (⤒)	77
semaf.fd (file)	221
semantic valuation	104, 109
semaphor (package)	220, 221, 247
semaphore symbols	220–221
\semapsto (⤒)	77
semibreve	see musical symbols
\semibreve (●)	166
\semibreveDotted (●.)	166
semidirect products	31, 33, 124
semiquaver	see musical symbols
\semiquaver (♪)	166
\semiquaverDotted (♪.)	166
\semiquaverDottedDouble (♪..)	166
\semiquaverDottedDoubleDown (♪..)	166
\semiquaverDottedDown (♪)	166
\semiquaverDown (♪)	166
\semiquaverRest (♪)	168
\semiquaverRestDotted (♪.)	168
\Semisextile (☒)	133
\Semicircle (⌿)	133
semitic transliteration	20, 24
\seModels (❖)	55
\semodels (❖)	55
semtrans (package)	20, 24, 247
\senwarrows (⤒)	81
\senwarrows (⤒)	77
\sencurvearrow (⤒)	82
\senharpoons (⤒)	85
\senharpoons (⤒)	80
\seovnearrow (⤒)	88
\SePa (♪)	165
\separated (ⓘ)	55
separation vector (⌚)	128
\sepitchfork (⌚)	93
\seppawns (○○)	186
\Serbia (●)	195
\sercurvearrow (⤒)	82
\SerialInterface (☒)	134

\SerialPort (\equiv)	134
\sersquigarrow (\rightsquigarrow)	77
\sesearrows (\Downarrow)	81
\sesearrows (\Downarrow)	77
\sespoon (\Downarrow)	93
\Sesquiquadrade (\P)	133
set interior see \mathring	
set operators	
intersection see \cap	
membership see \in	
union see \cup	
\setminus ()	31
\setminus ()	34
\setminus ()	34
\setminus ()	34
\setminus ()	36
\seVdash ($\not\vdash$)	55
\sevdash ($\not\vdash$)	55
\Sextile (\divideontimes)	133
\Sey (\circledcirc)	196
\sfive (\wp)	162
\sfour (\wp)	162
SGML	244
sha (III)	229
\Shake 	164
\shake 	164
\Shakel 	164
\Shakene 	164
\Shakenw 	164
\Shakesw 	164
\sharp (#)	163
\sharp (#)	163
\sharp (#)	163
\sharp (#)	163
\sharp (#)	167
\sharp (#)	163
\sharp (#)	163
\sharp	
\sharpArrowboth ($\downarrow\sharp$)	167
\sharpArrowdown ($\sharp\downarrow$)	167
\sharp	
\sharpArrowup ($\sharp\uparrow$)	167
Sharpe, Michael	24
\sharpSlashslashslashstem (#)	167
\sharpSlashslashslashslashstem (#)	167
\sharpSlashslashslashslashstem (#)	167
\sharpSlashslashstem (#)	167
\sharpSlashslashstem (#)	167
\sharpSlashslashstem (#)	167
\shfermion 	137
\Shift ([Shift <td>134</td>	134
\shift (\Downarrow)	30
\Shilling (β)	26
\shneg (\uparrow)	30
short-twig runes	162
\shortcastling (O-O)	186
\shortdownarrow (\Downarrow)	76
\shortdowntack (τ)	58
\shortleftarrow (\leftarrow)	76
\shortlefttack (\vdash)	58
\shortmid (\mid)	52
\shortmid (\mid)	60
\shortmid (\mid)	57
\shortmid (\mid)	34
\shortmid (\mid)	61
\ShortNinetyFive ($\overline{\text{S}\text{I}}$)	182
\shortparallel (\parallel)	52
\shortparallel (\parallel)	60
\shortparallel (\parallel)	57
\shortparallel (\parallel)	55
\shortparallel (\parallel)	61
\ShortPulseHigh (J)	130
\ShortPulseLow (T)	130
\shortrightarrow (\rightarrow)	76
\shortrightarrowarrowleftarrow (\leftrightarrow)	88
\shorttack (\vdash)	58
\ShortSixty ($\overline{\text{S}\text{I}}$)	182
\ShortThirty ($\overline{\text{S}\text{I}}$)	182
\shortuparrow (\uparrow)	76
\shortuptack (\perp)	58
\shortuptack (\perp)	61
\showclock	183
\shpos (\Downarrow)	30
shuffle (package)	37, 247, 248
\shuffle (\sqcup)	36
\shuffle (\sqcup)	37
shuffle product (\sqcup)	37
\SI (*)	135
\Sieb ($\overline{\text{S}\text{I}}$)	196
\sieve ($\overline{\text{S}\text{I}}$)	196
\Sigma (Σ)	97
\sigma (σ)	97
\sigmamaup (σ)	98
\sim (\sim)	52, 231, 242
\sim (\sim)	57
\sim (\sim)	55
\sim (\sim)	61
\simbot (\sim)	102
\simcolon ($\sim:$)	64
\simcoloncolon ($\sim::$)	64
\simeq (\simeq)	52
\simeq (\simeq)	57
\simeq (\simeq)	55
\simeq (\simeq)	61
\simeq (\simeq)	72
\simeq (\simeq)	72
\similarleftarrow (\Leftarrow)	88
\similarrightarrow (\Rightarrow)	88
\simlE (\simeq)	72
\simless ($\not\simeq$)	72
\simminussim (\approx)	61
\simneqq ($\not\approx$)	59
\simperp (\perp)	64
simplewick (package)	236
\simplus (\mp)	36
simpsons (package)	189, 247
Simpsons characters	189
\simrdots (\sim)	60
\simrdots (\sim)	61
\sin (sin)	96
\sincoh (\sim)	64
\sinewave (\sim)	125
\sinewave (\sim)	126
\sinh (sinh)	96
\SixFlowerAlternate (\divideontimes)	145
\SixFlowerAltPetal (\divideontimes)	145
\SixFlowerOpenCenter (\divideontimes)	145
\SixFlowerPetaldotted (\divideontimes)	145
\SixFlowerPetalRemoved (\divideontimes)	145
\SixFlowerRemovedOpenPetal (\divideontimes)	145
\SixStar (\star)	145
\SixteenStarLight (\divideontimes)	145
sixteenth note see musical symbols	
\sixteenthnote (J)	166
\sixteenthnote (JJ)	163
\sixteenthnotedotted ($\text{J}.$)	166
\sixteenthnotedotteddouble ($\text{J}..$)	166
\sixteenthnotedotteddoubledown (J')	166
\sixteenthnotedotteddown (J')	166
\sixteenthnoteDown (J')	166
skak (package)	186, 187, 247
skull (package)	186, 247
\skull (S)	196
\skull (S)	186
skulls	186, 196, 224
\slash (/)	242
\slashhb (H)	19
\slashhc (C)	19
\slashhd (D)	19
\slashdiv (Z)	33
slashed (package)	231, 232
\slashed	231, 232
slashed letters	231
\slashed.sty (file)	232
\slashu (U)	19
\Sleet (SA)	183
\sliding (\square)	23
\Slovakia (S)	195
\Slovenia ()	195

\smallaltoclef (⌚)	164
\smallawint (ƒ)	41
\smallawintsl (ƒ)	41
\smallawintup (ƒ)	41
\smallbassclef (⌚)	164
\smallblackcircle (●)	38
\smallblackdiamond (◆)	38
\smallblacklozenge (◆)	147
\smallblacksquare (■)	38
\smallblackstar (★)	38
\smallblacktriangledown (▼)	38, 74
\smallblacktriangleleft (◀)	38, 74
\smallblacktriangleleft (◀)	149
\smallblackangleright (▶)	38, 74
\smallblackangleright (▶)	149
\smallblacktriangleup (▲)	38, 74
\smallbosonloops (⌚)	137
\smallbosonloopA (⌚)	137
\smallbosonloopV (⌚)	137
\SmallCircle (○)	149
\smallcircle (○)	38
\smallcirfnint (ƒ)	41
\smallcirfnintsl (ƒ)	41
\smallcirfnintup (ƒ)	41
\SmallCross (×)	149
smallctrbull (bulletcntr package option)	185
\smallctrbull	185
\smalldiamond (◊)	38
\smalldiamond (◊)	38
\SmallDiamondshape (◊)	149
\smalldivslash (÷)	35
\smallfint (ƒ)	41
\smallfintsl (ƒ)	41
\smallfintup (ƒ)	41
\smallfrown (¬)	52
\smallfrown (¬)	60
\smallfrown (¬)	58, 95
\smallfrown (¬)	94
\smallfrown (¬)	61
\SmallHBar (—)	149
\smalliiint (∫∫∫)	41
\smalliiintsl (∫∫∫)	41
\smalliiintup (∫∫∫)	41
\smalliiint (∫∫∫)	41
\smalliiintsl (∫∫∫)	41
\smalliiintup (∫∫∫)	41
\smallint (ʃ)	41
\smallints (ʃ)	41
\smallintup (ʃ)	41
\smallintsl (ʃ)	125
\smallintup (ʃ)	125
\smallint (ʃ)	41
\smallintbar (ƒ)	41
\smallintbar (ƒ)	41
\smallintBarsl (ƒ)	41
\smallintbarsl (ƒ)	41
\smallintBarup (ƒ)	41
\smallintbarup (ƒ)	41
\smallintcap (ƒ)	41
\smallintcapsl (ƒ)	41
\smallintcapup (ƒ)	41
\smallintclockwise (ƒ)	41
\smallintclockwisesl (ƒ)	41
\smallintclockwiseup (ƒ)	41
\smallintcup (ƒ)	41
\smallintcups (ƒ)	41
\smallintcupup (ƒ)	41
\smallintlarhk (ƒ)	41
\smallintlarhksl (ƒ)	41
\smallintlarhkup (ƒ)	41
\smallintsl (ƒ)	41
\smallintup (ƒ)	41
\smallintx (ƒ)	41
\smallintxsl (ƒ)	41
\smallintxup (ƒ)	41
\SmallLowerDiamond (◊)	149
\smalllowint (ƒ)	41
\smalllowintsl (ƒ)	41
\smalllowintup (ƒ)	41
\smalllozenge (◊)	147
\smalllozenge (◊)	147
\smallni (ø)	61
\smallnoint (ƒ)	41
\smallnointsl (ƒ)	41
\smallnointup (ƒ)	41
\smalloiint (∬)	41
\smalloiintsl (∬)	41
\smalloiintup (∬)	41
\smalloiint (∬)	41
\smalloiintsl (∬)	41
\smalloiintup (∬)	41
\smalloint (ƒ)	41
\smallointctrcclockwise (ƒ)	41
\smallointctrcclockwisesl (ƒ)	41
\smallointctrcclockwiseup (ƒ)	41
\smallointsl (ƒ)	41
\smallointup (ƒ)	41
\smallowns (⌚)	101
\smallpencil (铅笔)	141
\smallpointint (ƒ)	41
\smallpointints (ƒ)	41
\smallpointintup (ƒ)	41
\smallprod (Π)	33
\SmallRightDiamond (◊)	149
\smallrppoint (ƒ)	41
\smallrppointsl (ƒ)	41
\smallrppointup (ƒ)	41
\smallscpolint (ƒ)	41
\smallscpolints (ƒ)	41
\smallscpolintup (ƒ)	41
\smallsetminus (＼)	31
\smallsetminus (＼)	35
\smallsetminus (＼)	35
\smallsetminus (＼)	34
\smallsetminus (＼)	36
\smallsmile (⌣)	52
\smallsmile (⌣)	60
\smallsmile (⌣)	58, 95
\smallsmile (⌣)	94
\smallsmile (⌣)	61
\smallsqint (ƒ)	41
\smallsqintsl (ƒ)	41
\smallsqintup (ƒ)	41
\SmallSquare (□)	149
\smallsquare (▣)	38
\smallsquare (▣)	38
\smallstar (★)	38
\smallsumint (ƒ)	41
\smallsumintsl (ƒ)	41
\smallsumintup (ƒ)	41
\smalltrebleclef (G)	164
\SmallTriangleDown (▽)	149
\smalltriangledown (▽)	37
\smalltriangledown (▽)	38, 74
\smalltriangledown (▽)	38, 73
\SmallTriangleLeft (◀)	149
\smalltriangleleft (◀)	37
\smalltriangleleft (◀)	39, 74
\smalltriangleleft (◀)	38, 73
\smalltriangleleft (◀)	148
\SmallTriangleRight (▶)	149
\smalltriangleright (▶)	37
\smalltriangleright (▶)	39, 74
\smalltriangleright (▶)	38, 73
\smalltriangleright (▶)	148
\SmallTriangleUp (△)	149
\smalltriangleup (△)	37
\smalltriangleup (△)	39, 74
\smalltriangleup (△)	38, 73
\smalltriangleup (△)	41
\smallupint (ʃ)	41
\smallupintsl (ʃ)	41
\smallupintup (ʃ)	41
\smallvarointclockwise (ƒ)	41
\smallvarointclockwisesl (ƒ)	41
\smallvarointclockwiseup (ƒ)	41
\smallvaroint (ƒ)	41
\smallvarointclockwiseup (ƒ)	41
\smallvarointclockwisesl (ƒ)	41
\smallvarointclockwiseup (ƒ)	41
\SmallVBar ()	149
\smallwhitestar (★)	39

\smartctrbull (bullcntr package option)	185
\smartctrbull	185
\smashtimes (※)	35
\smashtimes (※)	36
\smbblkcircle (●)	39
\smbblkcircle (●)	40
\smbblkdiamond (◆)	39
\smbblkdiamond (◆)	148
\smbblklozenge (◆)	147
\smbblklozenge (◆)	148
\smbblksquare (■)	39
\smbblksquare (■)	148
\smeparsl (#)	61
\smile (⌣)	52
\smile (⌣)	60
\smile (⌣)	57, 95
\smile (⌣)	94
\smile (⌣)	61
smile symbols	94, 95
\smileeq (≡)	57, 95
\smileeq (≈)	94
\smileeqfrown (Ӄ)	94
\smileface (ଓ)	196
\smilefrown (Ӄ)	57, 95
\smilefrown (Ӄ)	94
\smilefrowneq (Ӄ)	94
\Smiley (ଓ)	182, 196
\smiley (ଓ)	181
smiley faces	126, 135, 181, 182, 191, 196–202, 206–209
\smt (<)	72
\smte (≤)	72
\smwhitestar (★)	39
\smwhitestar (★)	148
\smwhtcircle (օ)	39
\smwhtcircle (օ)	148, 149
\smwhtdiamond (◊)	39
\smwhtdiamond (◊)	148, 149
\smwhtlozenge (◊)	147
\smwhtlozenge (◊)	148
\smwhtsquare (▣)	39
\smwhtsquare (▣)	148
snakes	210–211
\sndtstile ()	63
\Snow (❄)	183
\SnowCloud (☃)	183
\Snowflake (❄)	145
\SnowflakeChevron (❖)	145
\SnowflakeChevronBold (❖)	145
\snststile ()	63
\sntstile ()	63
\snttstile ()	63
\sO (օ)	134, 135
\sO (օ)	193
\SOH (◎)	135
\SOH (◎)	135
\solid (■■)	137
South Arabian alphabet	159
\SouthNode (❖)	133
	
\Soyombo (❖)	193
soyombo (package)	193, 247, 248
Soyombo (font)	193
Soyombo symbols	193
space	240
thin	240
visible	see \textvisiblespace
\Spacebar (█)	134
spades	151, 152, 197–198
\spadesuit (♠)	151
\spadesuit (♦)	151
\spadesuit (♣)	151
\spadesuit (♣)	151
\spadesuit (♣)	151
\Spain (🇪)	195
\Sparkle (❖)	145
\SparkleBold (❖)	145
sparkles	145
“special” characters	14
\SpecialForty (፳፻፭)	182
\sPed (፩)	164
\sphericalangle (❖)	124
\sphericalangle (◁)	123
\sphericalangle (◀)	123
\sphericalangle (◀)	123
\sphericalangle (◀)	123
\sphericalangle (◀)	123
\sphericalangle (◀)	123
\sphericalangledown (፩)	123
\sphericalangleleft (▶)	123
\sphericalangleup (▼)	123
\sphericalangleup (▼)	123
\spin (❖)	138
\SpinDown () ↓	149
\spindown (❖)	138
\SpinUp () ↑	149
\spinup (❖)	138
spirals	210–211
\spirituslenis (՞)	111
\spirituslenis (՞)	111
\splitvert (!)	135
\Spoon (՞)	196
spoon symbols	93, 94
\spreadlips (▣)	23
\Springtree (🌳)	197
\sqbullet (■)	33
\sqcap (¶)	35
\sqcapplus (¶)	32
\sqcapplus (¶)	34
\sqcapplus (¶)	33
\Sqcup (Ϣ)	35
\Sqcup (Ϣ)	36
\sqcup (□)	33
\sqcup (□)	30, 31
\sqcup (□)	34
\sqcup (□)	33
\sqcup (□)	36
\sqcupdot (¶)	34
\sqcupdot (¶)	33
\sqcupdot (¶)	32
\sqcupdot (¶)	33
\sqcupdot (¶)	34
\sqcupdot (¶)	33
\sqcupdot (¶)	32
\sqcupdot (¶)	34
\sqcupdot (¶)	33
\sqcupdot (¶)	33
\sqdoublecap (¶¶)	33
\sqdoublecup (Ϣ)	33
\sqdoublefrown (Ӄ)	94
\sqdoublefrowneq (Ӄ)	94
\sqdoublesmile (Ӄ)	94
\sqdoublesmileeq (Ӄ)	94
\squefrown (Ӄ)	94
\squefrown (Ӄ)	94
\sqfrown (՞)	94
\sqfrown (՞)	94
\sqfrownneq (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqfrownsmile (՞)	94
\sqrt (✓)	114
\sqrt (✓)	112, 233
\sqrt* (✓)	116
\sqsmile (՞)	94
\sqsmileeq (՞)	94
\sqsmileeqfrown (Ӄ)	94
\sqsmilefrown (Ӄ)	94
\Sqsubset (☒)	66
\Sqsubset (☒)	66
\sqSubset (☒)	65
\sqSubset (☒)	66
\sqsubset (□)	65
\sqsubset (□)	64, 65
\sqsubset (□)	66

\sqsubsetset (\sqsubset)	66
\sqsubsetset (\sqsubset)	66
\sqsubsetset (\sqsubset)	67
\sqsubsetseteq (\sqsubseteq)	65
\sqsubsetseteq (\sqsubset)	64
\sqsubsetseteq (\sqsubseteq)	66
\sqsubsetseteq (\sqsubseteq)	66
\sqsubsetseteq (\sqsubseteq)	67
\sqsubsetseteqq ($\sqsubseteq\!\sqsubseteq$)	65
\sqsubsetseteqq ($\sqsubseteq\!\sqsubseteq$)	66
\sqsubsetseteqq ($\sqsubseteq\!\sqsubseteq$)	66
\sqsubsetsetneq ($\not\sqsubseteq$)	65
\sqsubsetsetneq ($\not\sqsubseteq$)	66
\sqsubsetsetneq ($\not\sqsubseteq$)	66
\sqsubsetsetneq ($\not\sqsubseteq$)	67
\sqsubsetsetneqq ($\not\sqsubseteq\!\sqsubseteq$)	65
\sqsubsetsetneqq ($\not\sqsubseteq\!\sqsubseteq$)	66
\sqsubsetsetneqq ($\not\sqsubseteq\!\sqsubseteq$)	66
\Sqsupset (\exists)	66
\Sqsupset (\exists)	66
\sqSupset (\exists)	65
\sqSupset (\exists)	66
\sqSupset (\exists)	65
\sqSupset (\exists)	65
\sqSupset (\exists)	64, 65
\sqSupset (\exists)	66
\sqSupset (\exists)	66
\sqSupset (\exists)	66
\sqSupset (\exists)	67
\sqSupseteq ($\exists\!\sqsubseteq$)	65
\sqSupseteq ($\exists\!\sqsubseteq$)	64
\sqSupseteq ($\exists\!\sqsubseteq$)	66
\sqSupseteq ($\exists\!\sqsubseteq$)	66
\sqSupseteq ($\exists\!\sqsubseteq$)	67
\sqSupseteqq ($\exists\!\sqsubseteq\!\sqsubseteq$)	65
\sqSupseteqq ($\exists\!\sqsubseteq\!\sqsubseteq$)	66
\sqSupseteqq ($\exists\!\sqsubseteq\!\sqsubseteq$)	66
\sqSupsetneq ($\not\exists\!\sqsubseteq$)	66
\sqSupsetneq ($\not\exists\!\sqsubseteq$)	66
\sqSupsetneq ($\not\exists\!\sqsubseteq$)	67
\sqSupsetneqq ($\not\exists\!\sqsubseteq\!\sqsubseteq$)	65
\sqSupsetneqq ($\not\exists\!\sqsubseteq\!\sqsubseteq$)	66
\sqSupsetneqq ($\not\exists\!\sqsubseteq\!\sqsubseteq$)	66
\sqSupsetneqq ($\not\exists\!\sqsubseteq\!\sqsubseteq$)	67
\sqSupsetneqq ($\not\exists\!\sqsubseteq\!\sqsubseteq$)	67
\sqSupsetneqq ($\not\exists\!\sqsubseteq\!\sqsubseteq$)	68
\sqSupsetneqq ($\not\exists\!\sqsubseteq\!\sqsubseteq$)	68
\sqSupsetneqq ($\not\exists\!\sqsubseteq\!\sqsubseteq$)	69
\sqtriplefrown (\approx)	94
\sqtriplesmile (\approx)	94
\Square (\square)	133
\Square (\square)	143
\Square (\square)	150
\Square (\square)	149
\Square (\square)	150
\Square (\square vs. \square vs. \square) . . .	227
\square (\square)	33
\square (\square)	124
\square (\square)	147
\square (\square)	39
\square (\square)	188
\square (\square)	38
\square (\square)	149
square impulse	130
square root see \sqrt	
hooked see \hksqrt	
\squarebotblack (\blacksquare)	148
\SquareCastShadowBottomRight (\square)	150
\SquareCastShadowTopLeft (\square)	150
\SquareCastShadowTopRight (\square)	150
\squarecrossfill (\blacksquare)	148
\squaredots (:)	120
\squaredots (:)	33, 120
\squarehfill (\blacksquare)	148
\squarehfill (\blacksquare)	148
\squareleftblack (\blacksquare)	148
\squarellblack (\blacksquare)	148
\squarellquad (\blacksquare)	148
\squarelrblack (\blacksquare)	148
\squarelrquad (\blacksquare)	148
\squareneswfill (\blacksquare)	148
\squarenwsefill (\blacksquare)	148
\Squarepipe (\blacksquare)	136
\squarerightblack (\blacksquare)	148
squares	147–152, 173–178, 187, 188, 204–206, 210–211, 222
\SquareShadowA (\blacksquare)	149
\SquareShadowB (\blacksquare)	149
\SquareShadowBottomRight (\blacksquare)	150
\SquareShadowC (\blacksquare)	149
\SquareShadowTopLeft (\blacksquare)	150
\SquareShadowTopRight (\blacksquare)	150
\SquareSolid (\blacksquare)	150
\Squaresteel (\blacksquare)	136
\squaretopblack (\blacksquare)	148
\squareulblack (\blacksquare)	148
\squareulquad (\blacksquare)	148
\squareurblack (\blacksquare)	148
\squareurquad (\blacksquare)	148
\squarevfill (\blacksquare)	148
\squarewithdots (\blacksquare)	152
\squeezers (\blacksquare)	196
\squigarrowdownup (\curvearrowright) . . .	77
\squigarrowleftright (\curvearrowleft) . . .	77
\squigarrownesw (\curvearrowright)	77
\squigarrownwse (\curvearrowleft)	77
\squigarrowrightleft (\curvearrowleft)	77
\squigarrowsenw (\curvearrowright)	77
\squigarrowswne (\curvearrowleft)	77
\squigarrowupdown (\curvearrowleft)	77
\squoval (\square)	148
\squplus (\blacksquare)	33
\squplus (\blacksquare)	35
\SS (SS)	15, 134
\ss (β)	15
\ssdtstile ($\overline{\square}\parallel$)	63
\ssearrow (\searrow)	76
\ssearrow (\searrow)	86
\seven (:)	162
\sixx (:)	162
\sslash (//)	32
\sslash (//)	35
\sslash (//)	36
\sststile ($\overline{\square}\parallel$)	63
\sststile ($\overline{\square}$)	63
\sststile ($\overline{\square}\parallel$)	63
\swarrow (\swarrow)	76
\swarrow (\swarrow)	86
\staccatissimo (i)	168
\stackrel	30, 230, 234, 235
standard state	231
\star (*)	31, 234
\star (*)	162
\star (*)	39, 147
\star (*)	39
\star (*)	38
\star (*)	40
Star of David	144, 145
\stareq (\equiv)	57
\stareq (\equiv)	61
starfont (package)	133, 247, 248
\starofdavid (\heartsuit)	147
\starredbullet (*)	146
stars	124, 133, 144–149, 204–206
\stater (\flat)	27
\Station (S^t)	133
statistical independence	232
\staveI (.	190
\staveII (.	190
\staveIII (.	190
\staveIV (.	190
\staveIX (.	190
\staveL (.	190
\staveL (.	191
staveless runes	162
\staveLI (.	190
\staveLII (.	190
\staveLIII (.	190
\staveLIV (.	190
\staveLIX (.	191
\staveLV (.	190
\staveLVI (.	191
\staveLVII (.	191
\staveLVIII (.	191

\staveLX (..... 191
\staveLXI (..... 191
\staveLXII (..... 191
\staveLXIII (..... 191
\staveLXIV (..... 191
\staveLXV (..... 191
\staveLXVI (..... 191
\staveLXVII (..... 191
\staveLXVIII (..... 191
staves	190
staves (package)	190, 247
\staveV (..... 190
\staveVI (..... 190
\staveVII (..... 190
\staveVIII (..... 190
\staveIX (..... 191
\staveXI (..... 191
\staveXII (..... 191
\staveXIII (..... 191
\staveXIV (..... 191
\staveXIX (..... 191
\staveXL (..... 191
\staveXLI (..... 191
\staveXLII (..... 191
\staveXLIII (..... 191
\staveXLIV (..... 191
\staveXLIX (..... 190
\staveXLV (..... 191
\staveXLVI (..... 191
\staveXLVII (..... 190
\staveXLVIII (..... 190
\staveXV (..... 191
\staveXVI (..... 191
\staveXVII (..... 191
\staveXVIII (..... 191
\staveXX (..... 191
\staveXXI (..... 191
\staveXXII (..... 191
\staveXXIII (..... 191
\staveXXIV (..... 190
\staveXXIX (..... 190
\staveXXV (..... 190
\staveXXVI (..... 190
\staveXXVII (..... 190
\staveXXVIII (..... 190
\staveXXX (..... 190
\staveXXXI (..... 190
\staveXXXII (..... 190
\staveXXXIII (..... 191
\staveXXXIV (..... 191
\staveXXXIX (..... 191
\staveXXXV (..... 191
\staveXXXVI (..... 191
\staveXXXVII (..... 191
\staveXXXVIII (..... 191
\stdtstile (..... 63
\steaming (..... 196
steinmetz (package)	131, 247, 248
Steinmetz phasor notation	131
sterling	<i>see \pounds</i>
\sthree (..... 162
stick figures	153, 197, 217–221
\Stigma (ζ)	159
\Stigma (Γ)	159
\stigma (ζ)	159
\stigma (τ)	159
stix (package)	36, 40, 41, 48, 50, 61, 62, 67, 71, 72, 74, 87, 89–91, 96, 99–101, 103, 107, 111, 114, 120, 122, 123, 126, 132, 134, 136, 148, 149, 151, 163, 184, 247, 248
stmaryrd (package)	32, 42, 53, 65, 72, 76, 92, 95, 102, 104, 227, 231, 246, 247
stochastic independence	<i>see \bot</i>
\StoneMan (\blacktriangle)	183
\Stopsign (\textcircled{S})	136
\StopWatchEnd (\textcircled{E})	183
\StopWatchStart (\textcircled{O})	183
\stress (') 25
\Strichmaxerl (\mathfrak{K})	197
\strictfi (ε)	53
\strictfi (ε)	60
\strictif (\rightarrow)	53
\strictif (\rightarrow)	60
\strictiff ($\varepsilon\rightarrow$)	53
\StrikingThrough ()	25
\strns (—)	126
\strokedint (f)	47
\StrokeFive (\#)	183
\StrokeFour (\)	183
\StrokeOne (\)	183
\StrokeThree (\)	183
\strokethrough (\)	111
\StrokeTwo (\)	183
\stst ($^{\circ}$)	231
\stststile (..... 63
\sttstile (..... 63
\stttstile (..... 63
\STX (\bullet)	135
.sty files	12
\SUB (\cdot)	135
subatomic particles	137–138
\subcorner (..... 23
\subdoublebar (..... 23
\subdoublevert (..... 23
\stdtstile (..... 63
\subdot (..... 67
\sublptr (..... 23
\submult (\natural)	67
\subrarr (\natural)	67
\subrptr (..... 23
subscripts	
new symbols used in	232
\Subset (\Subset)	65
\Subset (\Subset)	65
\Subset (\Subset)	66
\Subset (\Subset)	66
\Subset (\Subset)	66
\Subset (\Subset)	67
\subset (\subset)	65
\subset (\subset)	64
\subset (\subset)	66
\subset (\subset)	66
\subset (\subset)	67
\subset (\subset)	67
\subsetapprox (\Subset)	67
\subsetcirc (\Subset)	67
\subsetdot (\Subset)	67
\subeteq (\subseteq)	65
\subeteq (\subseteq)	64
\subeteq (\subseteq)	66
\subeteq (\subseteq)	66
\subeteq (\subseteq)	67
\subeteqq (\subseteq)	65
\subeteqq (\subseteq)	65
\subeteqq (\subseteq)	66
\subeteqq (\subseteq)	66

\subsetneqq (\subseteq)	66	\succneqq (\succneq)	59	\supset (\supset)	64
\subsetneqq (\subseteq)	67	\succneqq (\succneq)	61	\supset (\supset)	66
\subsetneq (\subsetneq)	65	\succnsim (\succnsim)	54	\supset (\supset)	66
\subsetneq (\subsetneq)	65	\succnsim (\succnsim)	53	\supset (\supset)	67
\subsetneq (\subsetneq)	66	\succnsim (\succnsim)	60	\supsetapprox (\supsetapprox)	67
\subsetneq (\subsetneq)	66	\succnsim (\succnsim)	59	\supsetcirc (\supsetcirc)	67
\subsetneq (\subsetneq)	66	\succnsim (\succnsim)	57	\supsetdot (\supsetdot)	67
\subsetneq (\subsetneq)	67	\succnsim (\succnsim)	61	\supseteq (\supseteq)	65
\subsetneq (\subsetneq)	66	\succnsim (\succnsim)	54	\supseteq (\supseteq)	64
\subsetneqq (\subsetneq)	65	\succsim (\succsim)	52	\supseteqq (\supseteqq)	66
\subsetneqq (\subsetneq)	66	\succsim (\succsim)	60	\supseteqq (\supseteqq)	66
\subsetneqq (\subsetneq)	66	\succsim (\succsim)	58	\supseteqq (\supseteqq)	67
\subsetneqq (\subsetneq)	66	\succsim (\succsim)	55	\supseteqqq (\supseteqqq)	65
\subsetneqq (\subsetneq)	67	\succsim (\succsim)	61	\supseteqqq (\supseteqqq)	65
\subsetplus (\subsetplus)	65	such that	230, 231	\supseteqqq (\supseteqqq)	66
\subsetplus (\subsetplus)	66	\suchthat (\exists)	231	\supseteqqq (\supseteqqq)	66
\subsetplus (\subsetplus)	67	\sum (\sum)	42	\supseteqq (\supseteqq)	66
\subsetplusseq (\subsetplusseq)	65	\sum (\sum)	47	\supseteqq (\supseteqq)	67
\subsetplusseq (\subsetplusseq)	66	\sum (\sum)	47	\supsetneq (\supsetneq)	65
subsets	64–67	\sum (\sum)	49	\supsetneq (\supsetneq)	65
\subsim (\subsim)	67	\sumint (\sumint)	47	\supsetneq (\supsetneq)	66
\subsub (\subsub)	67	\sumint (\sumint)	47	\supsetneq (\supsetneq)	66
\subsup (\subsup)	67	\sumint (\sumint)	49	\supsetneq (\supsetneq)	66
\Succ (\Succ)	61	\sumintsl (\sumintsl)	50	\supsetneqq (\supsetneqq)	65
\succc (\succc)	52	\sumintup (\sumintup)	50	\supsetneqq (\supsetneqq)	65
\succc (\succc)	57	\Summertree ()	197	\supsetneqq (\supsetneqq)	66
\succc (\succc)	55	\Summit (\Summit)	183	\supsetneqq (\supsetneqq)	66
\succc (\succc)	61	\SummitSign (\SummitSign)	183	\supsetneqq (\supsetneqq)	66
\succcapprox (\succcapprox)	54	\Sun (\Sun)	132	\supsetneqq (\supsetneqq)	67
\succcapprox (\succcapprox)	52	\Sun (\Sun)	133	\supsetplus (\supsetplus)	65
\succcapprox (\succcapprox)	60	\Sun (\Sun)	132	\supsetplus (\supsetplus)	66
\succcapprox (\succcapprox)	58	\Sun (\Sun)	183	\supsetplus (\supsetplus)	67
\succcapprox (\succcapprox)	55	\Sun (\Sun)	227	\supsetpluseq (\supsetpluseq)	65
\succcapprox (\succcapprox)	61	sun	131–133, 152, 181, 183, 197–198, 224, 227	\supsetpluseq (\supsetpluseq)	66
\succccurlyeq (\succccurlyeq)	54	\sun (\sun)	132	\supsim (\supsim)	67
\succccurlyeq (\succccurlyeq)	52	\sun (\sun)	181	\supsub (\supsub)	67
\succccurlyeq (\succccurlyeq)	58	\SunCloud (\SunCloud)	183	\supsup (\supsup)	67
\succccurlyeq (\succccurlyeq)	55	\SunshineOpenCircled (\SunshineOpenCircled)	152	\surd (\surd)	124
\succccurlyeq (\succccurlyeq)	52	\sup (sup)	96	\surface (\surface)	138
\succccurlyeq (\succccurlyeq)	60	\supdsub (\supdsub)	67	\SurveySign (\SurveySign)	183
\succccurlyeq (\succccurlyeq)	58	\supedot (\supedot)	67	\svrexample (\svrexample)	138
\succccurlyeq (\succccurlyeq)	55	superscripts		\svrphoton (\svrphoton)	138
\succccurlyeq (\succccurlyeq)	61	new symbols used in	232	svrsymbols (package)	137, 247, 248
\succceqq (\succceqq)	53	supersets	64–67	\Swallow (\Swallow)	76
\succceqq (\succceqq)	58	\suphsol (\suphsol)	67	\Swallow (\Swallow)	86
\succceqq (\succceqq)	61	\suphsub (\suphsub)	67	\Swallow (\Swallow)	81
\succcnapprox (\succcnapprox)	54	\suplarr (\suplarr)	67	\Swallow (\Swallow)	77
\succcnapprox (\succcnapprox)	53	\supmult (\supmult)	67	\Swallow (\Swallow)	88
\succcnapprox (\succcnapprox)	60	supremum	see \sup	\swallow (\swallow)	76
\succcnapprox (\succcnapprox)	59	\Supset (\Supset)	65	\swallow (\swallow)	75, 233
\succcnapprox (\succcnapprox)	57	\Supset (\Supset)	65	\swallow (\swallow)	81
\succcnapprox (\succcnapprox)	61	\Supset (\Supset)	66	\swallow (\swallow)	77
\succcneq (\succcneq)	54	\Supset (\Supset)	66	\swallow (\swallow)	92
\succcneq (\succcneq)	59	\Supset (\Supset)	66	\swallow (\swallow)	88
\succcneq (\succcneq)	61	\Supset (\Supset)	66	\swallowtail (\swallowtail)	81
\succcneqq (\succcneqq)	53	\Supset (\Supset)	67	\swallowtail (\swallowtail)	77
\succcneqq (\succcneqq)	60	\Supset (\Supset)	65	\swbkarrown (\swbkarrown)	81

\Sweden ()	195
Swedo-Norwegian runes	see short-twigs runes
\swfilledspoon (✓)	93
\swfootline (✓)	55
\swfree (✓)	55
\sharpoonccw (✗)	80
\sharpooncw (✓)	80
\sharpoonnw (✓)	85
\sharpoonse (✗)	85
\Switzerland (•)	195
\swlcurvearrow (↙)	82
\swlsquigarrow (↘)	77
\swmapsto (⤠)	77
\swModels (⤡)	55
\swmodels (⤢)	55
\swnearrows (⤣)	81
\swnearrows (⤤)	78
\swnecurvearrow (⤥)	82
\swneharpoons (⤦)	85
\swneharpoons (⤧)	80
swords	182
\swords (✗)	196
\swpitchfork (⤨)	93
\swrcurvearrow (⤩)	83
\swrsquigarrow (⤪)	78
\swspoon (⤪)	93
\swswallows (⤫)	81
\swswallows (⤬)	78
swung dash	see \sim
\swVdash (⤩)	55
\swvdash (⤪)	55
\syl (⠄)	23
\syllabic (.)	25
\symA (Ⓐ)	128
\symAE (Ӕ)	129
\symB (Ⓑ)	128
\symbolbishop (♗)	187
Symbol (font)	98, 229
symbols	14–153, 163–204, 206, 223, 224, 226, 228, 235, 240–241, 243
actuarial	116, 235
alpine	183
ancient language	153–162
annuity	116, 235
APL	61–62, 133, 134
astrological	131–133, 206–209
astronomical	131–133, 191, 206–209
Begriffsschrift	121
biological	136
block-element	190
body-text	14–29
bold	240–241
box-drawing	190
chess	186, 187, 224–226
cipher	191
clock	181–184, 197–198
communication	136
computer	199–202
computer hardware	134
contradiction	30, 95
cooking	196, 199–202
countries	194
crystallography	222
currency	26, 27, 126, 129
dangerous bend	181
database	126
definition	30, 235
dictionary	17–20, 189
dingbat	139–152
dot	14, 119–121, 234
electrical	130
engineering	126, 130, 136
Epi-Olmec	160–161
extensible	91, 112–118, 131, 228, 234–236
Feynman diagram	137
file	199–202
Frege logic	91, 102, 121, 122, 126
frown	94, 95
game-related	151, 183, 184, 186–188, 199–202, 223–226
gates, digital logic	135
genealogical	181
general	181
Go stones	187, 188
Halloween	40, 118
information	182
informator	186
inverted	17–20, 24, 229–230
Isthmian	160–161
keyboard	134
knitting	193
Knuth's	181
laundry	182
legal	14, 15, 27, 28, 243
letter-like	100–102, 199–202
life insurance	116, 235
linear logic	30–32, 37, 38, 42, 46–48, 52, 64, 100, 101
linguistic	17–20
log-like	96, 240
logic	135
<i>Magic: The Gathering</i>	224
magical signs	190
map	204–206
maps	194
mathematical	30–129
media control	182, 199–202
METAFONTbook	181
metrical	188, 189
miscellaneous	124, 125, 127, 152, 181–198, 203
monetary	26, 27, 129
musical	28, 163–180, 197–202
non-commutative division	119
particle physics	137–138
Phaistos disk	153
phonetic	17–20
physical	130
Pitman's base	122, 185
present value	116, 235
proto-Semitic	153
pulse diagram	130
recycling	192, 196–202, 204
relational	52
relational database	126
reversed	229–230
rotated	17–20, 24, 229–230
runes	162
safety-related	136
scientific	130–138, 222
semaphore	220–221
Simpsons characters	189
smile	94, 95
Soyombo	193
spoon	93, 94
staves	190
subset and superset	64–67
technological	130–138
TeXbook	181
transliteration	20
upside-down	17–20, 24, 229–230, 242
variable-sized	42–52, 226, 228
weather	183, 197–198
Web	199–202
yin-yang	182, 196–198, 210–211
zodiacal	131–133, 206–209
symbols.tex (file)	226, 246, 247
\symC (Ⓒ)	128
\symking (♔)	187
\symknight (♕)	187
\symOE (օ)	129
\sympawn (♙)	187
\symqueen (♕)	187
\symrook (♖)	187
\symUE (Ӯ)	129
\SYN (▬)	135
T	
T (↑)	162
\T	16
\T (⠄)	24
\T (⊗)	188
\t (⠄)	21
\t (⊗)	188

\textbar (↑)	162	
t4phonet (package)	20, 24, 247	
\Tab (✉)	134	
\tabcolsep	230	
\tachyon (t)	138	
tacks	52, 100	
\taild (d)	19	
\tailinvr (l)	19	
\taill (l)	19	
\tailn (n)	19	
\tailr (r)	19	
\tails (s)	19	
\tailt (t)	19	
\tailz (z)	19	
\Takt	165	
\talloblong (ll)	32	
\talloblong (l l)	39	
\talloblong (l)	40	
\tally (L U □ □)	185	
tally markers	157, 183, 185	
\tan (tan)	96	
\tanh (tanh)	96	
\Tape (⌚)	152	
\Taschenuhr (⌚)	183	
Tate-Shafarevich group	see sha	
\Tau (T)	97	
\tau (τ)	97	
\tauleptonminus (τ-)	138	
\tauleptonplus (τ+)	138	
\Taurus (♉)	132	
\Taurus (♉)	133	
\Taurus (♉)	132	
\taurus (♉)	131	
tautology	see \top	
\tauup (τ)	98	
\tcenitgrade (°C)	121	
\tcmu (μ)	121	
\tcohm (Ω)	121	
\tcpertenthousand (‰)	121	
\tcpertousand (‰)	121	
\td (✉)	23	
\tdtstile ()	63	
\tdststile ()	63	
\tdtstile ()	63	
\tdttstile ()	63	
technological symbols	130–138	
\Telefon (☎)	136	
\Telephone (☎)	183	
\Telephone (☎)	192	
Tennent, Bob	30	
tensor product	see \otimes	
\Tent (▲)	183	
\tenuto (—)	168	
\Terminus (⊗)	188	
\terminus (⊗)	188	
\Terminus* (⊕)	188	
\terminus* (⊕)	188	
\Terra (⊕)	133	
\tesh (ʃ)	19	
testfont.dvi (file)	238	
testfont.tex (file)	238, 239	
\tetartemorion (ɔ)	27	
teubner (package)	27, 121, 159, 189, 247, 248	
TeX	12, 73, 74, 91, 120, 131, 190, 226, 229–236, 238–240, 242, 244, 245, 249	
.tex files	244, 245	
TeXbook, The	230–235, 239 symbols from	181
\text	30, 232, 233	
\textacutedbl (")	25	
\textacutemacron (ˊ)	21	
\textacutewedge (ˇ)	21	
\textadvancing (˘)	21	
\textAlpha (A)	16	
\textalpha (α)	16	
\textaolig (ω)	18	
\textara	162	
\textarc	162	
\textarl	162	
\textarm	162	
\textarn	162	
\textart	162	
\textasciacute (ˊ)	25, 243	
\textascibreve (ˇ)	25	
\textasciicaron (߂)	25	
\textasciicircum	14	
\textasciicircum (߁)	14, 242, 244	
\textasciidieresis (߂)	25, 243	
\textasciigrave (ˋ)	25	
\textasciimacron	242	
\textasciimacron (߁)	25, 243	
\textasciitilde	14	
\textasciitilde (߁)	14, 242, 244	
\textasteriskcentered (*)	14	
\textasteriskcentered (*)	14	
\textbabygamma (߂)	17	
\textbackslash	14	
\textbackslash (\\)	241, 242	
\textbaht (฿)	26	
\textbar	14	
\textbar ()	241, 242	
\textbarb (܂)	17	
\textbarc (܂)	17	
\textbard (܂)	17	
\textbardbl ()	14	
\textbardbl ()	14	
\textbardotlessj (܂)	17	
\textbarg (܂)	17	
\textbarglotstop (?)	17	
\textbari (܂)	17	
\textbarl (܂)	17	
\textbaro (܂)	17	
\textbarrevglotstop (܂)	17	
\textbaru (܂)	17	
\textbeltl (܂)	17	
\textbentailyogh (܂)	18	
\textBeta (܂)	16	
\textbeta (܂)	16, 17	
\textbigcircle (܂)	14	
\textbigcircle (܂)	14	
\textbktailgamma (܂)	18	
\textblank (܂)	28	
\textblock (܂)	190	
\textborn (܂)	181	
\textbottomtiebar (܂)	21	
\textbraceleft	14	
\textbraceright	14	
\textbrevemacron (܂)	21	
\textbrokenbar (܂)	28, 243	
\textbullet (܂)	14	
\textbullet (܂)	14, 244	
\textbullseye (܂)	17	
\textcelsius (܂)	130, 245	
\textceltpal (܂)	17	
\textcent (܂)	26, 243	
\textcentoldstyle (܂)	26	
\textChi (X)	16	
\textchi (܂)	16, 17	
\textcircled (܂)	21	
\textcircledP (܂)	27	
\textcircledP (܂)	27	
\textcircumacute (܂)	21	
\textcircumdot (܂)	21	
\textclosepsilon (܂)	17	
\textcloseomega (܂)	17	
\textcloserevepsilon (܂)	17	
\textcolonmonetary (܂)	26	
\textcommatailz (܂)	17	
textcomp (package)	12, 14, 15, 21, 25–28, 75, 110, 126, 130, 163, 181, 226, 242, 244, 247	
\textcopyleft	27	
\textcopyleft (܂)	27	
\textcopyright (܂)	14, 27	
\textcopyright (܂)	14, 27, 243	
\textcorner (܂)	17	
\textcrb (܂)	17	
\textcrd (܂)	20	
\textcrd (܂)	17	
\textcrg (܂)	17	
\textcrh (܂)	20	
\textcrh (܂)	17	
\textcrinvglotstop (܂)	17	
\textcrlambda (܂)	17	
\textcrtwo (܂)	17	
\textctc (܂)	17	
\textctd (܂)	18	
\textctdctzlig (܂)	18	
\textctesh (܂)	18	
\textctinvglotstop (܂)	18	

\textctj (j)	18	\textepsilon (ε)	16, 18	\texthtg (g)	17
\textctjvar (j)	18	\textesh (ʃ)	20	\texthth (fi)	17
\textctn (n)	18	\textesh (ʃ̄)	18	\texththeng (f̄)	17
\textctstretchc (β)	18	\textestimated (ᴱ)	28	\texthtk (k̄)	20
\textctstretchcvar (c̄)	18	\textEta (H̄)	16	\texthtk (k̄̄)	17
\textctt (t̄)	18	\texteta (η̄)	16	\texthttp (p̄)	20
\textcttctclig (tc̄)	18	\texteuro (€̄)	27	\texthttp (p̄̄)	17
\textctturnt (ḡ)	18	\texteuro (€̄̄)	26	\texthtq (q̄)	17
\textctyogh (ȝ̄)	18	\texteuro (€̄̄̄)	26, 244	\texthttaild (c̄̄̄)	17
\textctz (ȝ̄̄)	18	\textexclamdown	14	\texthtscg (Ḡ)	17
\textcurrency (؋)	26, 243	\textfallrise (؈)	22	\texthtt (f̄)	20
\textcypr	158	\textfemale (♀)	19	\texthtt (f̄̄)	17
\textdagger (†)	14	\textfishhookr (r̄)	18	\texthvlig (hv̄)	17
\textdagger (†̄)	14	\textfiveoldstyle (5̄)	28	\textifsym	130
\textdaggerdbl (‡)	14	\textfjlig (f̄̄)	20	\textinterrobang (՞)	28
\textdaggerdbl (‡̄)	14	\textflorin (f̄̄̄)	26	\textinterrobangdown (՞̄)	28
\textdbend (⤙)	181	\textfouroldstyle (4̄)	28	\textinvglotstop (ʒ̄)	17
\textdblyphen (=)	28	\textfractionsolidus (/̄)	126	\textinvomega (Ϟ̄)	18
\textdblyphenchar (=̄)	28	\textfrak	128	\textinvsca (ۋ̄)	18
\textdblylig (db̄)	18	\textfrbarn (n̄)	19	\textinvscri (ۋ̄̄)	17
\textdctzlig (dz̄)	18	\textfrhookd (d̄)	19	\textinvscri (ۋ̄̄̄)	18
\textdegree (°)	126, 243	\textfrhookt (t̄)	19	\textinvsbridge (ۋ̄̄̄̄)	22
\textDelta (Δ)	16	\textfrtailgamma (γ̄)	19	\textIota (Ī)	16
\textdelta (δ̄)	16	\texttg (ḡ)	18	\textiota (ῑ)	20
\textdied (†̄)	181	\textGamma (Γ̄)	16	\textKappa (K̄)	16
\textdiscount (٪)	28	\textgamma (γ̄̄)	16, 18	\textkappa (x̄)	16
\textdiv (÷̄)	126	\textglobfall (↴̄)	18	\textknit	193
\textdivorced (Ѡ̄)	181	\textglobrise (↵̄)	18	\textknit{2} (⤙̄)	193
\textdkshade (ࡔ̄)	190	\textglotstop (՞̄)	17	\textknit{3} (⤙̄̄)	193
\textdnblock (ࡔ̄̄)	190	\textglotstopvari (՞̄̄)	19	\textknit{4} (⤙̄̄̄)	193
\textdollar (\$)	14	\textglotstopvarii (՞̄̄̄)	19	\textknit{5} (⤙̄̄̄̄)	193
\textdollar (\$)	14, 26	\textglotstopvariii (՞̄̄̄̄̄)	19	\textknit{6} (⤙̄̄̄̄̄)	193
\textdollaroldstyle (\$̄)	26	\textgoth	128	\textknit{7} (↵̄̄̄̄̄)	193
\textdong (ද̄)	26	\textgravecircum (܂̄)	22	\textknit{8} (܂̄̄)	193
\textdotacute (܂̄̄)	21	\textgravedbl (܂̄̄̄)	25	\textknit{9} (܂܂̄)	193
\textdotbreve (܂̄̄̄)	21	\textgravedot (܂̄̄̄̄)	22	\textknit{"} (܂܂܂̄)	193
\textdoublebaresh (f̄)	18	\textgravemacron (܂̄̄̄̄̄)	22	\textknit{} (܂܂܂܂̄)	193
\textdoublebarpipe (†̄)	18	\textgravemid (܂̄̄̄̄̄̄)	22	\textknit{()} (⤙̄̄̄̄̄̄)	193
\textdoublebarpipevar (†̄̄)	18	\textgreater	14	\textknit{()} (⤙̄̄̄̄̄̄̄)	193
\textdoublebarslash (≠̄)	18	\textgreater (>)	241, 242	\textknit{*} (*)	193
\textdoublegrave (܂̄̄̄)	21	\textgreek (package)	16, 98, 247,	\textknit{-} (-)	193
\textdoublegrave (܂̄̄̄̄)	24		248	\textknit{:} (⤙̄̄̄̄̄̄̄)	193
\textdoublepipe (̄)	18	\textgrgamma (γ̄)	19	\textknit{;} (⤙̄̄̄̄̄̄̄̄)	193
\textdoublepipevar (̄̄)	18	\textguarani (₲̄)	26	\textknit{;;} (⤙̄̄̄̄̄̄̄̄̄)	193
\textdoublevbaraccent (܂̄̄̄̄)	21	\texthalflength (܂̄̄̄̄̄)	17	\textknit{<} (⤙̄̄̄̄̄̄̄̄̄̄)	193
\textdoublevbaraccent (܂̄̄̄̄̄)	24	\texthardsign (܂̄̄̄̄̄̄)	17	\textknit{@} (⦿̄)	193
\textdoublevertline (̄̄)	18	\textheng (܂̄̄̄̄̄̄̄)	19	\textknit{[]} (⤙̄̄̄̄̄̄̄̄̄̄̄)	193
\textdownarrow (↓̄)	75	\texthighrise (܂̄̄̄̄̄̄̄̄)	22	\textknit{}{} (⤙̄̄̄̄̄̄̄̄̄̄̄̄)	193
\textdownfullarrow (↓̄̄)	19	\texthmlig (܂̄̄̄̄̄̄̄̄̄)	19	\textknit{A} (⤙̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	193
\textdownstep (↓̄̄̄)	18	\texthooktop (܂̄̄̄̄̄̄̄̄̄̄)	17	\textknit{a} (⤙̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	193
\textdyoghlig (ȝ̄̄̄)	18	\texthtb (܂̄̄̄̄̄̄̄̄̄̄̄)	20	\textknit{B} (⤙̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	193
\textdzlig (dz̄̄̄)	18	\texthtb (܂̄̄̄̄̄̄̄̄̄̄̄̄)	17	\textknit{b} (⤙̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	193
\texteightoldstyle (8̄)	28	\texthtbardotlessj (܂̄̄̄̄̄̄̄̄̄̄̄̄̄)	17	\textknit{E} (⤙̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	193
\textellipsis	14	\texthtbardotlessjvar (܂̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	18	\textknit{F} (⤙̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	193
\textemdash	14	\texthtc (܂̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	20	\textknit{f} (⤙̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	193
\textendash	14	\texthtc (܂̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	17	\textknit{H} (⤙̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	193
\textEpsilon (Ē)	16	\texthtd (܂̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	20		
\textepsilon (ε̄)	20	\texthtd (܂̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄̄)	17		

\textknit{h} (↓)	193
\textknit{I} (↗)	193
\textknit{i} (↗)	193
\textknit{J} (↖)	193
\textknit{j} (↖)	193
\textknit{L} (↖)	193
\textknit{l} (↖)	193
\textknit{M} (m)	193
\textknit{m} (m)	193
\textknit{O} (O)	193
\textknit{Q} (Q)	193
\textknit{q} (Q)	193
\textknit{R} (A)	193
\textknit{r} (A)	193
\textknit{S} (←)	193
\textknit{s} (→)	193
\textknit{T} (Q)	193
\textknit{t} (Q)	193
\textknit{U} (♂)	193
\textknit{u} (♂)	193
\textknit{V} (V)	193
\textknit{v} (V)	193
\textknit{W} (W)	193
\textknit{w} (W)	193
\textknit{X} (Q)	193
\textknit{x} (Q)	193
\textknit{Y} (♀)	193
\textknit{y} (♀)	193
\textknit{Z} (Ω)	193
\textknit{z} (Ω)	193
\textLambda (Λ)	16
\textlambda (λ)	16, 17
\textangle (⟨)	110, 242
\textlbrackdbl (⟦)	110
\textleaf (⌚)	181
\textleftarrow (←)	75
\textlengthmark (:	17
\textless	14
\textless (⟨)	241, 242
\textlfblock (█)	190
\textlfhookrlig (ḥ)	18
\textlhbend (⌚)	181
\textlhookfour (⌚)	18
\textlhookp (p)	18
\textlhookt (t)	17
\textlhti (i)	18
\textlhtlongi (i)	17
\textlhtlongy (ψ)	17
\textlinb	157, 158
\textlira (£)	26
\textlnot (¬)	126, 243
\textlonglegr (r)	17
\textlooptoprevesh (l)	18
\textlowering (⌚)	22
\textlowrise (⌚)	22
\textlptr (⌚)	17
\textlquill ({})	110
\textltailm (ŋ)	17
\textltailn (ɲ)	20
\textltailn (ɲ)	17
\textltilde (ł)	18
\textltshade (░)	190
\textlyoghlig (ȝ)	18
\textmarried (ଓ)	181
\textmho (Ӯ)	130
\textmicro (μ)	16
\textmidacute (՚)	22
\textminus (−)	126
\textMu (M)	16
\textmu (μ)	130, 243
\textmu (μ)	16
\textmugreek (μ)	16
\textmusicalnote (♪)	163
\textnaira (₦)	26
\textnineoldstyle (g)	28
\textnrleg (ŋ)	18
\textNu (N)	16
\textnu (ν)	16
\textnumero (№)	28
\textObardotlessj (j)	18
\textObullseye (○)	18
\textohm (Ω)	130
\textOlyoghlig (ȝ)	18
\textOmega (Ω)	16
\textomega (ω)	16, 18
\textOmicron (O)	16
\textomikron (o)	16
\textonehalf (½)	126, 243
\textoneoldstyle	28
\textoneoldstyle (ı)	28
\textonequarter (¼)	126, 243
\textonesuperior (¹)	126, 243
\textopenbullet (օ)	28
\textopencorner (՞)	18
\textopeno (ɔ)	20
\textopeno (ɔ)	18
\textordfeminine (ª)	14
\textordfeminine (ª)	14, 243
\textordmasculine (º)	14
\textordmasculine (º)	14, 243
\textovercross (⌚)	22
\textoverw (⌚)	22
\textpalhook (,	18
\textpalhooklong (,	19
\textpalhookvar (,	19
\textparagraph (¶)	14
\textparagraph (¶)	14
\textperiodcentered (.)	14
\textperiodcentered (.)	14, 243
\textpertenthousand (%oo)	14
\textpertenthousand (%oo)	14
\textperthousand (%o)	14
\textperthousand (%)	14, 244
\textpeso (P)	26
\textPhi (Φ)	16
\textphi (φ)	16, 18
\textPi (Π)	16
\textpi (π)	16
\textpilcrow (¶)	28
\textpipe ()	20
\textpipe ()	18
\textpipevar (l)	19
\textpm (±)	126, 243
\textpmhg	154
\textpolhook (⌚)	22
\textprimstress (')	18
\textproto	153
\textPsi (Ψ)	16
\textpsi (ψ)	16
\textqplig (ϙ)	19
\textquestiondown	14
\textquotedbl (")	17, 241
\textquotedblleft	14
\textquotedblright	14
\textquotefirst	14
\textquoteright	14
\textquotesingle (')	28, 241
\textquotestraightbase (,)	28
\textquotestraightdblbase (,,)	28
\textraiseglotstop (?)	18
\textraisevibyi (l)	18
\textraising (՚)	22
\textramshorns (՚)	18
\textrangle ()}	110, 242
\textrbrackdbl (⟧)	110
\textrecipe (R)	28, 228
\textrectangle (°)	19
\textreferencemark (※)	28, 30
\textregistered (®)	14, 27
\textregistered (®)	14, 27, 243
\textretracting (⌚)	22
\textretractingvar (⌚)	19
\textrevapostrophe (')	18
\textreve (ء)	18
\textrevespsilon (ڙ)	18, 229
\textreversedvideobend (ڦ)	181
\textrevglotstop (߰)	18
\textrevscl (݂)	19
\textrevscr (݂)	19
\textrevyogh (ȝ)	18
\textRho (P)	16
\textrho (ρ)	16
\textrhooka (ا)	19
\textrhooke (ء)	19
\textrhokepsilon (ε)	19
\texthookopeno (ڦ)	19
\texthookrevepsilon (ڙ)	18

\textrhookschwa (œ)	18	\textSFi (ᵑ)	190	\textsublhalfring (ⓘ)	22
\textrhoticity (˜)	18	\textSFii (ᵒ)	190	\textsubplus (⊕)	22
\textrightarrow (→)	75	\textSFiii (ᵓ)	190	\textsubrhalfring (ⓘ)	22
\textringmacron (᷂)	22	\textSFiv (ᵔ)	190	\textsubrightarrow (→)	19
\textrisefall (᷃)	22	\textSFix (ᵕ)	190	\textsubring (ⓘ)	22
\textroundcap (࡚)	22	\textSF1 (࡚)	190	\textsubsquare (࡚)	22
\textrptr (˜)	18	\textSFli (ࡏ)	190	\textsubtilde (࡚)	22
\textrquill (ࡊ)	110	\textSFlii (ࡏ)	190	\textsubumlaut (࡚)	22
\textrtaild (ࡍ)	20	\textSFliii (ࡏ)	190	\textsubw (ࡊ)	22
\textrtaild (ࡍ)	18	\textSFliv (ࡏ)	190	\textsubwedge (࡚)	22
\textrtailh (ࡍ)	19	\textSFv (ࡏ)	190	\textsuperimpostilde (࡚)	22
\textrtaill (ࡍ)	18	\textSFvi (ࡏ)	190	\textsuperscript (ࡊ)	23
\textrtailn (ࡍ)	17	\textSFvii (ࡏ)	190	\textsurd (ࡊ)	126
\textrtailr (ࡍ)	17	\textSFviii (ࡏ)	190	\textswab (ࡊ)	128
\textrtails (ࡍ)	17	\textSFX (ࡊ)	190	\textsyllabic (࡚)	22
\textrtailt (ࡍ)	20	\textSFxi (ࡊ)	190	\textTau (T)	16
\textrtailt (ࡍ)	17	\textSFxix (ࡏ)	190	\textTau (ࡊ)	16
\textrtailz (ࡍ)	17	\textSFxl (ࡏ)	190	\texttctclig (ࡊ)	17
\textrtblock (࡚)	190	\textSFxli (ࡏ)	190	\textteshlig (ࡊ)	20
\textrthook (ࡊ)	17	\textSFxlii (ࡏ)	190	\textteshlig (ࡊ)	17
\textrthooklong (ࡊ)	18	\textSFxliii (ࡏ)	190	\textTheta (Θ)	16
\textRubikUa (Ua ແ)	203	\textSFxlv (ࡏ)	190	\texttheta (ࡊ)	16, 17
\textsarab (ࡊ)	159	\textSFxlvi (ࡏ)	190	\textthing (ࡊ)	182
\textsca (ࡊ)	17	\textSFxlvii (ࡏ)	190	\textthorn (ࡊ)	18
\textscapital (ࡊ)	18	\textSFxlviii (ࡏ)	190	\textthornvari (ࡊ)	19
\textscb (ࡊ)	17	\textSFxliii (ࡏ)	190	\textthornvarii (ࡊ)	19
\textscdelta (ࡊ)	18	\textSFxx (ࡏ)	190	\textthornvariii (ࡊ)	19
\textsce (ࡊ)	17	\textSFxxi (ࡏ)	190	\textthornvariv (ࡊ)	19
\textscf (ࡊ)	18	\textSFxxii (ࡏ)	190	\textthreeoldstyle (ࡊ)	28
\textscg (ࡊ)	17	\textSFxxiii (ࡏ)	190	\textthreequarters (ࡊ)	126, 243
\textscha (ࡊ)	17	\textSFxxiv (ࡏ)	190	\textthreequartersemdash (ࡊ)	28
\textscha (ࡊ)	20	\textSFxxv (ࡏ)	190	\textthreesuperior (ࡊ)	126, 243
\textscha (ࡊ)	17	\textSFxxvi (ࡏ)	190	\texttildedot (ࡊ)	22
\textsci (ࡊ)	17	\textSFxxvii (ࡏ)	190	\texttildelow (ࡊ)	28, 242
\textscj (ࡊ)	17	\textSFxxviii (ࡏ)	190	\texttimes (ࡊ)	126
\textscj (ࡊ)	17	\textSFxxvii (ࡏ)	190	\texttoneletterstem (ࡊ)	18
\textscj (ࡊ)	18	\textSFxxx (ࡏ)	190	\texttoptiebar (ࡊ)	22
\textscj (ࡊ)	17	\textSFxxvi (ࡏ)	190	\texttrademark (TM)	14, 27
\textscj (ࡊ)	18	\textSFxxvii (ࡏ)	190	\texttrademark (TM)	14, 27, 244
\textscj (ࡊ)	17	\textSFxxviii (ࡏ)	190	\texttslig (ࡊ)	18
\textscj (ࡊ)	17	\textSFxxvii (ࡏ)	190	\textturna (ࡊ)	18
\textscj (ࡊ)	18	\textSFxxx (ࡏ)	190	\textturncelig (ࡊ)	18
\textscj (ࡊ)	17	\textSFxxvi (ࡏ)	190	\textturnglotstop (ࡊ)	19
\textscj (ࡊ)	18	\textSFxxvii (ࡏ)	190	\textturnnh (ࡊ)	18
\textscj (ࡊ)	17	\textSFxxviii (ࡏ)	190	\textturnnk (ࡊ)	18
\textscj (ࡊ)	18	\textSFxxx (ࡏ)	190	\textturnlonglegr (ࡊ)	18
\textscj (ࡊ)	17	\textSFxxvi (ࡏ)	190	\textturnnm (ࡊ)	18
\textscj (ࡊ)	18	\textSFxxvii (ࡏ)	190	\textturnmrleg (ࡊ)	18
\textscj (ࡊ)	17	\textSFxxviii (ࡏ)	190	\textturnnr (ࡊ)	18
\textscj (ࡊ)	18	\textSFxxx (ࡏ)	190	\textturnrrtail (ࡊ)	18
\textscj (ࡊ)	17	\textSFxxvi (ࡏ)	190	\textturnsck (ࡊ)	19
\textscj (ࡊ)	18	\textSFxxvii (ࡏ)	190	\textturnscripta (ࡊ)	18
\textscj (ࡊ)	17	\textSFxxviii (ࡏ)	190	\textturnscu (ࡊ)	19
\textscj (ࡊ)	18	\textSFxxx (ࡏ)	190	\textturntur (ࡊ)	18
\textscj (ࡊ)	17	\textSFxxvi (ࡏ)	190	\textturnthree (ࡊ)	19
\textscj (ࡊ)	18	\textSFxxvii (ࡏ)	190		

\textturntwo (૨) 19
\textturnv (ા) 18
\textturnw (ા) 18
\textturny (ા) 18
\texttwelveudash (્) 28
\texttwooldstyle 28
\texttwooldstyle (૨) 28
\texttwosuperior (૨) 126, 243
\textuncrfemale (૦) 19
\textunderscore 14
\textuparrow (↑) 75
\textupblock (█) 190
\textupfullarrow (↑) 19
\textUpsilon (ૢ) 16
\textupsilon (૖) 16, 18
\textupstep (↑) 18
\textvbaraccent (ૻ) 23
\textvbaraccent (૽) 24
\textvertline (|) 18
\textvibyi (૧) 18
\textvibyy (૭) 18
\textvisiblespace 14
\textwon (૮) 26
\textwynn (૗) 18
\textXi (ૃ) 16
\textxi (૫) 16
\textxswdown (૪) 182
\textxswup (૪) 182
\textyen (૴) 26, 243
\textyogh (૩) 20
\textyogh (૩) 18
\textzerooldstyle (૦) 28
\textZeta (૙) 16
\textzeta (૥) 16
.tfm files 12, 204, 226, 245
tfrupee (package) 27, 247, 248
\TH (૑) 15, 243
\th (૧) 162
\th (૧) 15, 243
Thành, Hàn Thé 234
\therefore (∴) 54
\therefore (∴) 52, 119
\therefore (∴) 60
\therefore (∴) 120
\therefore (∴) 120
\therefore (∴) 120
\Thermo 183
\thermod (૧) 126
\Theta (૦) 97
\theta (૧) 97
\thetaaup (૧) 98
\thething (૤) 182
\thickapprox (≈) 52
\thickapprox (≈) 60
\thickapprox (≈) 58
\thickapprox (≈) 61
\thicksim (~~) 52
\thicksim (~~) 60
\thicksim (~~) 58
\thicksim (~~) 61
\thicksim (~~) 52
\thicksim (~~) 60
\thicksim (~~) 58
\thicksim (~~) 61
\thickvert (|) 104
thin space 240
\ThinFog (૩) 183
\thinstar (*) 38
\third (૩) 124
thirty-second note . see musical
 symbols
\thirtysecondNote (♪) 166
\thirtysecondNoteDotted (♪)
 166
\thirtysecondNoteDottedDouble
 (♪..) 166
\thirtysecondNoteDottedDoubleDown
 (૪) 166
\thirtysecondNoteDottedDown
 (૪) 166
\thirtysecondNoteDown (૪) 166
\Thorn (૒) 20
\thorn (૑) 20
\thorn (૑) 19
\thorn (૑) 20
thousandths see
 \textperthousand
\threeBeamedQuavers (♪♪♪) . . .
 167
\threeBeamedQuaversI (♪♪♪) . . .
 167
\threeBeamedQuaversII (♪♪♪)
 167
\threeBeamedQuaversIII
 (♪♪♪) 167
\threedangle (૯) 123
\threedotcolon (:). 36
\threesim (≈) 231
thumb pizzicato see \lilyThumb
tick see check marks
\tieinfinity (∞) 122
TikZ (package) 196–198, 203
tikzsymbols (package) 196, 197,
 247, 248
tilde 14, 17, 19, 21–23, 25, 28,
 110, 112, 115, 234, 242
 extensible 112, 115
 vertically centered 242
\tilde (˜) 111
\tilde (˜) 110, 234
\tildel (˜) 19
time of day 183, 184
time signatures 167
\timelimit (⊕) 186
\mathbf{times} (×) 31
\mathbf{times} (×) 35
\mathbf{times} (×) 34
\mathbf{times} (×) 33
\mathbf{times} (×) 36
Times Roman (font) 26, 228
\times (×) 34
\times (×) 36
timing (package) 130
tipa (package) 17, 18, 20, 21, 23,
 24, 229, 247
tipx (package) 18, 247
\Tmesonminus (T⁻) 138
\Tmesonnull (T⁰) 138
\Tmesonplus (T⁺) 138
\tminus (−) 36
\tndtstile (|||) 63
\tnststile (|||) 63
\tntstile (|||) 63
\tnttstile (|||) 63
\to see \rightarrow
\to (→) 83
\ToBottom (⤔) 182
\toea (⤔) 88
\tona (⤔) 88
\tone 18
\Tongey (⤓) 196
\top (⊤) 31, 100, 232
\top (⊤) 101
\top (⊤) 100
\top (⊤) 101
\topborder (⊸) 188
\topbot (⊠) 232, 233
\topbot (⊠) 101
\Topbottomheat (□) 196
\topcir (⊵) 126
\topdoteq (⊶) 54
\topfork (⊷) 60
\topfork (⊷) 61
\Topheat (□) 196
\topsemicircle (⊸) 148
torus (𝕋) see alphabets, math
\tosa (⤔) 88
\ToTop (⤔) 182
\towa (⤔) 89
\tpplus (+) 36
\TR (⤓) 134
trademark 14, 27, 243, 244
 registered 14, 27, 243
\TransformHoriz (◦•) 64
transforms 64, 118
\TransformVert (◐) 64
transliteration 20, 24
 semitic 20, 24
transliteration symbols 20
transpose 31
transversal intersection see
 \pitchfork
\trapezium (□) 148
\trebleclef (♩) 164
trees 197, 224

\trema (̄)	see accents
\trfsigns (package)	64, 101, 118, 247
\triangle (\triangle)	124
\triangle (\triangle)	39, 74
\triangle (\triangle)	188
\triangle (\triangle)	73
\triangle (\triangle)	40, 149
triangle relations	72–74
\trianglelecdot (\triangle)	148
\TriangleDown (\blacktriangledown)	150
\TriangleDown (∇)	149
\TriangleDown (\blacktriangledown vs. ∇)	227
\triangledown (∇)	124
\triangledown (∇)	147
\triangledown (∇)	39, 74
\triangledown (∇)	73
\triangledown (∇)	148
\triangleeq (\triangleq)	74
\triangleeq (\triangleq)	73
\TriangleLeft (\triangleleft)	150
\triangleleft (\triangleleft)	73
\triangleleft (\triangleleft)	31
\triangleleft (\triangleleft)	74, 147
\triangleleft (\triangleleft)	39, 74
\triangleleft (\triangleleft)	73
\triangleleftblack (\triangleleft)	148
\trianglelefteq (\trianglelefteq)	73
\trianglelefteq (\trianglelefteq)	72
\trianglelefteq (\trianglelefteq)	74
\trianglelefteq (\trianglelefteq)	74
\trianglelefteq (\trianglelefteq)	69, 73
\trianglelefteq (\trianglelefteq)	74
\trianglelefteqslant (\trianglelefteqslant)	72
\trianglelefteqslant (\trianglelefteqslant)	74
\triangleminus (\triangleleft)	40
\triangleodot (\triangleodot)	148
\triangleplus (\triangleplus)	40
\triangleq (\triangleq)	30, 72
\triangleq (\triangleq)	60
\triangleq (\triangleq)	74
\triangleq (\triangleq)	73
\triangleq (\triangleq)	74
\TriangleRight (\triangleright)	150
\triangleright (\triangleright)	73
\triangleright (\triangleright)	31
\triangleright (\triangleright)	74, 147
\triangleright (\triangleright)	39, 74
\triangleright (\triangleright)	73
\trianglerightblack (\triangleright)	148
\trianglerighteq (\trianglerighteq)	73
\trianglerighteq (\trianglerighteq)	72
\trianglerighteq (\trianglerighteq)	74
\trianglerighteq (\trianglerighteq)	74
\trianglerighteq (\trianglerighteq)	69, 73
\trianglerighteq (\trianglerighteq)	74
\trianglerighteqslant (\trianglerighteqslant)	72
\twiddle	see tilde
\trianglerighteqslant (\trianglerighteqslant)	74
\twoBeamedQuavers (♪)	167
\twocaps (M)	36
\twocups (W)	36
\twoheaddownarrow (\Downarrow)	86
\twoheaddownarrow (\Downarrow)	81
\twoheaddownarrow (\Downarrow)	78
\twoheaddownarrow (\Downarrow)	89
\twoheadleftarrow (\Leftarrow)	75
\twoheadleftarrow (\Leftarrow)	86
\twoheadleftarrow (\Leftarrow)	81
\twoheadleftarrow (\Leftarrow)	78
\twoheadleftarrow (\Leftarrow)	89
\twoheadleftarrowtail (\Leftarrowtail)	89
\twoheadleftdbkarrow (\Leftarrowtail)	89
\twoheadmapsfrom (\Leftarrowtail)	89
\twoheadmapsto (\Rightarrowtail)	89
\twoheadnearrow (\nearrow)	81
\twoheadnearrow (\nearrow)	78
\twoheadnarrow (\nearrow)	81
\twoheadnarrow (\nearrow)	78
\twoheadrightarrow (\rightarrow)	75
\twoheadrightarrow (\rightarrow)	86
\twoheadrightarrow (\rightarrow)	81
\twoheadrightarrow (\rightarrow)	78
\twoheadrightarrow (\rightarrow)	89
\twoheadrightarrowtail (\rightarrowtail)	89
\twoheadsearrow (\searrow)	81
\twoheadsearrow (\searrow)	78
\twoheadswarrow (\swarrow)	81
\twoheadswarrow (\swarrow)	78
\twoheaduparrow (\uparrow)	86
\twoheaduparrow (\uparrow)	81
\twoheaduparrow (\uparrow)	78
\twoheaduparrow (\uparrow)	89
\twoheaduparrowcircle (\uparrow)	89
\twoheadwhiteuparrow (\uparrow)	86
\twoheadwhiteuparrowpedestal (\uparrow)	86
\twonotes (♪)	163
\twonotes (♪)	163
\txfonts (package)	30, 32, 44, 53, 54, 65, 68, 76, 95, 98–100, 124, 128, 151, 226, 228, 242, 247
\type1cm (package)	226
\typecolon ($:$)	36
Type 1 (font)	239
U	
\U (U)	162
\U (U)	24
\U (U)	21
\U (U)	21
\u (u)	21
u (u)	162
\UA (U)	134
\UArrow (U)	134
\UB (U)	165
\ubar (u)	20

\ubarbbrevis (✉)	189
\ubarbrevis (✉)	189
\barsbrevis (✉✉)	189
\ubrbrak (⊠)	126
\ubrevislonga (⊜)	189
ubulb.fd (file)	239
ucs (package)	245
\udesc (ψ)	20
udingbat.fd (file)	213
\udot (·)	33
\udotdot (··)	34, 120
\udotdot (··)	33, 120
\udots (···)	120
\udots (···)	120
\udtimes (⊗)	37
\UHORN (U)	16
\uhorn (u)	16
\ularc (⌈)	126
\ulblacktriangle (▶)	148
\ulcorner (⌜)	102
\ulcorner (⌞)	102
\ulcorner (⌞)	102
\ulcorner (⌞)	106
\ulcorner (⌞)	105
\ulcorner (⌞)	103
\ullcorner (⌞)	106
\ullcorner (⌞)	105
\ulrcorner (⌞)	106
\ulrcorner (⌞)	105
\ulrcorner (⌞)	105
ulsy (package)	37, 95, 229, 247
\ultriangle (▽)	148
\Umd (ℳ)	165
\uminus (⊖)	36
umlaut (ẗ)	see accents
umranda (package)	210, 211, 247
umrandb (package)	211, 212, 247
unary operators	30
\unclear (∞)	186
\underaccent	234
\underarc (⏜)	24
\underarch (⏝)	23
\underbrace (⏝)	114
\underbrace (⏝)	113
\underbrace (⏝)	113
\underbrace (⏝)	114
\underbrace (⏝)	114
\underbrace (⏝)	112
\underbrace (⏝)	114
\underbracket (⏝)	114
\underbracket (⏝)	235, 236
\underdots (..)	25
\undergroup (⏝)	114
\undergroup (⏝)	113
\undergroup (⏝)	113
\underleftarrow (⏝)	114
\underleftarrow (⏝)	92, 113
\underleftharp (⏝)	91
\underleftharpdown (⏝)	91
\underleftharpoon (⏝)	114
\underleftrightarrow (⏝)	114
\underleftrightarrow (⏝)	92, 113
\underleftswishingghost (⏝)	118
\underleftwutchonbroom (⏝)	118
\underleftwutchonbroom* (⏝)	118
underline	14, 30, 112, 116
\underline (⏝)	112
\underlinesegment (⏝)	113
\underlinesegment (⏝)	113
\underparen (⏝)	114
\underparenthesis (⏝)	235, 236
\underrightarrow (⏝)	114
\underrightarrow (⏝)	92, 113
\underrightharp (⏝)	91
\underrightharpdown (⏝)	91
\underrightharpoon (⏝)	114
\underrightswishingghost (⏝)	118
\underrightwutchonbroom (⏝)	118
\underrightwutchonbroom* (⏝)	118
\underring (◦)	25
underscore	see underline
underscore (package)	14
\underscriptleftarrow (⏝)	118
\underscriptleftrightarrow (⏝)	118
\underscriptrightarrow (⏝)	118
\underset	230
undertilde (package)	115, 247
\undertilde (~)	25
\underwedge (϶)	25
Unicode	12, 190, 244–246
union	see \cup
unit disk (𝔻)	see alphabets, math
\unitedpawns (∞)	186
units (package)	126
unity (𝟙)	see alphabets, math
universa (package)	150, 182, 247
\unlhd (⊲)	31, 32
\unlhd (⊲)	71
\unlhd (⊲)	69, 73
\unlhd (⊲)	36
\unrh (⊷)	31, 32
\unrh (⊷)	71
\unrh (⊷)	69, 73
\unrh (⊷)	36
\upalpha (α)	98
\upand (⊗)	36
\UParrow (▲)	181
\Uparrow (↑)	75, 103
\Uparrow (↑)	81
\Uparrow (↑)	106
\Uparrow (↑)	78
\Uparrow (↑)	89
\Uparrow (↑)	107
\uparrow (↑)	75, 103, 226
\uparrow (↑)	106
\uparrow (↑)	81
\uparrow (↑)	78
\uparrow (↑)	92
\uparrow (↑)	107
\uparrow (↑)	89
\uparrowbarred (†)	89
\uparrowoncircle (Φ)	148
\uparrowtail (↑)	82
\uparrowtail (↑)	78
\upAssert (⊥)	58
\upassert (⊥)	58
\upbackepsilon (϶)	99
\upbar	23
\upbeta (β)	98
\upbkarrow (↑)	82
\upblackarrow (↑)	86
\upblackspoon (↑)	94
\upbow (↙)	164
\upbowtie (⤔)	34, 35
\upbracketfill	235
\upchi (χ)	98
\updasharrow (↑)	86
\updasharrow (↑)	89
\Updelta (Δ)	98
\Updelta (δ)	98
\Updownarrow (⇕)	75, 103
\Updownarrow (⇕)	82
\Updownarrow (⇕)	106

\Updownarrow (↕)	78
\Updownarrow (↕)	89
\Updownarrow (↑↓)	107
\updownarrow (↓↑)	75, 103
↑	
\updownarrow (↓)	106
\updownarrow (↑)	82
\updownarrow (↑)	78
\updownarrow (↓)	92
↑	
\updownarrow (↑↓)	107
\updownarrow (↑↓)	89
\updownarrowbar (↓)	86
\updownarrowbar (↑)	89
\updownarrows (↑↓)	76
\updownarrows (↑↓)	82
\updownarrows (↑↓)	78
\updownarrows (↑↓)	89
\updownblackarrow (↓)	86
\updowncurvearrow (⤤)	83
\updownharpoonleftleft (⤏)	90
\updownharpoonleftright (⤏)	85
\updownharpoonleftright (⤏)	80
\updownharpoonleftright (⤏)	90
\updownharpoonrightleft (⤏)	85
\updownharpoonrightleft (⤏)	80
\updownharpoonrightleft (⤏)	90
\updownharpoonrightright (⤏)	90
\updownharpoons (⤏)	77
\updownharpoons (⤏)	85
\updownharpoons (⤏)	80
\updownharpoonsleftright (⤏)	85
\updownharpoonsleftright (⤏)	90
\Updownline (⤏)	55
\updownline (⤏)	55
\downsquigarrow (⤤)	83
\downwavearrow (⤤)	82
\downwhitearrow (⤤)	86
\upepsilon (ε)	98
\upeta (η)	98
\filledspoon (⤏)	93
\fishtail (⤏)	61
\footline (⤏)	55
\free (⤏)	55
\gamma (Γ)	98
\gamma (γ)	98
upgreek (package)	16, 98, 247
\upharpoonccw (⤏)	80
\upharpooncw (⤏)	80
\upharpoonleft (⤏)	77
\upharpoonleft (⤏)	76
\upharpoonleft (⤏)	87
\upharpoonleft (⤏)	85
\upharpoonleft (⤏)	90
\upharpoonleftbar (⤏)	90
\upharpoonright (⤏)	77
\upharpoonright (⤏)	76
\upharpoonright (⤏)	87
\upharpoonright (⤏)	85
\upharpoonright (⤏)	90, 91
\upharpoonrightbar (⤏)	91
\upharpoonsleftright (⤏)	91
\upin (⤏)	61
upint (stix package option)	41, 42, 49, 51
\upint (⤏)	49
\upintsl (⤏)	51
\upintup (⤏)	51
\upiota (ι)	98
\upkappa (κ)	98
\Uplambda (Λ)	98
\uplambda (λ)	98
\uplcurvearrow (⤏)	83
\upleftcurvedarrow (⤏)	83
\uplett	23
\uplsquigarrow (⤤)	83
\uplsquigarrow (⤤)	78
\uplus (⊕)	33
\uplus (⊕)	31
\uplus (⊕)	35
\uplus (⊕)	35
\uplus (⊕)	34
\uplus (⊕)	36
\Upmapsto (⤏)	82
\upmapsto (⤏)	82
\upmapsto (⤏)	78
\upModels (⤏)	55
\upmodels (⤏)	58
\upmodels (⤏)	55
\upmu (μ)	98
\upnu (ν)	98
\Upomega (Ω)	98
\upomega (ω)	98
\upp (⤏)	25
\upparentfill	235
\Upphi (Φ)	98
\upphi (φ)	98
\Uppi (Π)	98
\uppi (π)	98
\uppitchfork (⤏)	95
\uppitchfork (⤏)	93
\upproto (⤏)	55
\Uppsi (Ψ)	98
\uppsi (ψ)	98
upquote (package)	242
\uprcurvearrow (⤤)	83
\uprho (ρ)	98
upright Greek letters	16, 98
\uprightcurvearrow (⤤)	83
\uprightcurvearrow (⤤)	89
\uprsquigarrow (⤤)	83
\uprsquigarrow (⤤)	78
upside-down symbols	242
upside-down symbols	17–20, 24, 229
\Upsilonigma (Σ)	98
\upsigma (σ)	98
\Upsilonilon (Υ)	97
\upsilon (υ)	97
\Upsilonilonmeson (Υ)	138
\upsilonup (υ)	98
\upslice (Δ)	38
\upspoon (⤤)	94
\upspoon (⤤)	93
\upt (⤏)	25
\uptau (τ)	98
\uptherefore (∴)	120
\uptherefore (∴)	33, 120
\Uptheta (Θ)	98
\uptheta (θ)	98
\uptodownarrow (⤏)	76
\uptodownarrow (⤏)	86
\upuparrows (⤏)	76
\upuparrows (⤏)	75
\upuparrows (⤏)	86
\upuparrows (⤏)	82
\upuparrows (⤏)	78
\upuparrows (⤏)	89
\upupharpoons (⤏)	77
\Upupsilon (Υ)	98
\upupsilon (υ)	98
\uparepsilon (ε)	98
\upvarphi (φ)	98
\upvarpi (ϖ)	98
\upvarrho (ρ)	98
\upvarsigma (σ)	98
\upvartheta (ϑ)	98
\upVDash (⤏)	58
\upVdash (⤏)	58
\upVdash (⤏)	55
\upvDash (⤏)	58
\upvdash (⤏)	58
\upvdash (⤏)	55
\upwavearrow (⤤)	82
\upwhitearrow (⤏)	86
\upwhitearrow (⤏)	89
\Upxi (Ξ)	98
\upxi (ξ)	98
\upY (λ)	34
\upY (λ)	33
\upzeta (ζ)	98
\Uranus (δ)	132
\Uranus (δ)	133
\Uranus (δ)	132
\uranus (δ)	131
\urarc (⤏)	126
\urblacktriangle (▼)	148
\urcorner (⤏)	102

\urcorner (⊤)	102
\urcorner (⊤)	102
\urcorner ()	106
1	
\urcorner ()	105
\urcorner (⊤)	103
url (package)	242
\urtriangle (⊲)	148
urwchancal (package)	128, 247
\US (_)	134, 135
\US (_)	135
\usepackage	12
\usf (↗)	164
\usfz (↑)	164
ushort (package)	116, 247, 248
\ushort (▀)	116
\ushortdw (▀)	116
\ushortw (▀)	116
\ut (▀)	23
UTF-8	245
utf8x (inputenc package option)	245
\utilde (▀)	115
\utimes (×)	34, 35
\utimes (×)	37
\utimes (×)	33
Utopia (font)	26, 51
\UU (U)	134
\UUparrow (⤠)	89
\UUparrow (⤢)	108
\Uparrow (⤠)	82
\Uparrow (⤠)	89
\Uparrow (⤢)	108
uwebo.fd (file)	210
V	
\v (▀)	21
\vara (a)	20
\aramalg (✉)	34
\varangle (⦚)	124
\barwedge (⤠)	36
\varbeta (β)	99
\varbigcirc (○)	32
\varbigtriangledown (▽)	149
\varbigtriangleup (△)	149
\varcap (∩)	35
\varCapricorn (܂)	133
\varcarriagereturn (⤡)	89
\VarClock (⌚)	183
\varclub (܃)	151
\varclubsuit (܃)	151
\varclubsuit (܃)	151
\varcoppa (܃)	159
\varcoprod (⅀)	47
\varcup (∪)	35
\varcurlyvee (܄)	32
\varcurlywedge (܄)	32
\vardiamond (◆)	151
\vardiamondsuit (♦)	151
\vardiamondsuit (♦)	151
\vardiamondsuit (♦)	151
\vardigamma (܅)	159
\vardoublebarwedge (܀)	36
\vardownarrow (↓)	92
\vardownwavearrow (↓)	82
\varEarth (܁)	132
\varepsilon (ε)	97
\varepsilon (ε)	99
\varepsilon (ε)	99
\varepsilon (ε)	98
\VarFlag (܁)	183
varg (txfonts/pxfonts package option)	99
\varg (g)	99
\varg (g)	99
\varg (g)	20
\vageq (⩵)	68
\varhash (#)	124
\varhash (#)	60
\varheart (♥)	151
\varheartsuit (♥)	151
\varheartsuit (♥)	151
\varheartsuit (♥)	151
\varhexagon (○)	148
\varhexagon (○)	146
\varhexagonblack (●)	148
\varhexagonrbonds (⦿)	148
\varhexstar (*)	144
\varhookdownarrow (↓)	82
\varhookleftarrow (←)	82
\varhookleftarrow (←)	92
\varhooknearrow (↗)	82
\varhooknarrow (↖)	82
\varhookrightarrow (→)	82
\varhookrightarrow (→)	92
\varhooksearrow (↘)	82
\varhookswarrow (↙)	82
\varhookuparrow (↑)	82
\vari (i)	20
variable-sized symbols	42–52, 226, 228
\VarIceMountain (܂)	183
\varinjlim (lim)	92, 96
\varint (ʃ)	43
\varintercal (⠊)	35
\various (R)	186
\varisinobar (܃)	61
\varisins (ε)	60
\varisins (ε)	61
\varkappa (ϰ)	97
\varkappa (ϰ)	99
\varkappa (ϰ)	99
\varleftarrow (←)	92
\varleftrightarrow (↔)	92
\varleftwavearrow (↔)	82
\varleftwavearrow (↔)	82
\varleq (≤)	68
\varliminf (lim)	96
\varlimsup (lim)	96
\varlongleftarrow (⟵)	92
\varlongleftrightarrow (⟵)	92
\varlongmapsfrom (⟵)	92
\varlongmapsto (⟵)	92
\varlongrightarrow (⟵)	92
\varlrtriangle (⤣)	149
\varlrttriangle (⤣)	74, 147
\varmapsfrom (↔)	92
\varmapsto (↔)	92
\varmathbb	128
\varmodtwosum (Σ)	48
\varMoon (܂)	133
\VarMountain (܂)	183
\varnearrow (↗)	92
\varniobar (܂)	61
\varnis (܂)	60
\varnis (܂)	61
\varnothing (Ø)	30, 124
\varnothing (Ø)	125
\varnothing (Ø)	125
\varnothing (Ø)	125
\varnothing (Ø)	123
\varnotin (∉)	100
\varnotowner (∉)	100
\varnarrow (⤢)	92
\varoast (⊗)	32
\varobar (⦿)	32
\varobslash (⦿)	32
\varocircle (◎)	32
\varodot (◎)	32
\varogreaterthan (⊗)	32
\varoiintclockwise (fff)	44
\varoiintctrcclockwise (fff)	44
\varoint (ʃ)	45
\varointclockwise (ʃ)	44
\varointclockwise (ʃ)	44
\varointctrcclockwise (ʃ)	44
\varoint (ʃ)	43
\varointclockwise (ʃ)	44
\varointclockwise (ʃ)	45
\varointclockwise (ʃ)	48
\varointclockwise (ʃ)	49
\varointclockwisesl (ʃ)	50
\varointclockwiseup (ʃ)	50
\varointctrcclockwise (ʃ)	45
\varointctrcclockwise (ʃ)	45
\varointctrcclockwise (ʃ)	48
\varolessthan (⊗)	32
\varomega (ଓ)	20

\varominus (\ominus)	32	\varsubsetneq (\subsetneq)	66	\varVdash (\Vdash)	61
\varopeno (\circ)	20	\varsubsetneqeq (\subsetneqeq)	66	\varveebar (\veebar)	36
\varoplus (\oplus)	32	\varsubsetneqq (\subsetneqq)	67	\varw (w)	99
\varoslash (\oslash)	32	\varsubsetneqqq (\subsetneqqq)	65	\vary (y)	99
\varosum (\sum)	48	\varsubsetneqqq (\subsetneqqq)	65	\VBar (\mid)	150
\varotimes (\otimes)	32	\varsubsetneqqq (\subsetneqqq)	66	\Vbar ($\bar{\ll}$)	58
\varovee ($\vee\!\vee$)	32	\varsubsetneqqq (\subsetneqqq)	66	\Vbar ($\bar{\ll}$)	62
\varowedge ($\wedge\!\wedge$)	32	\varsubsetneqqq (\subsetneqqq)	66	\vBar (\pm)	58
\varparallel (\parallel)	53	\varsubsetneqqq (\subsetneqqq)	67	\vBar (\pm)	61
\varparallelinv ($\parallel\!\parallel$)	53	\varsum (\sum)	48	\vBarv (\mp)	62
\varpartialdiff (∂)	102	\varsumint (\oint)	48	\vbipropto (8)	33
\varphi (φ)	97	\VarSummit (\triangle)	183	\vbrtri (\triangleright)	74
\varphi (φ)	99	\varsupsetneq (\supsetneq)	65	\vcntcolon (:)	62
\varphi (φ)	99	\varsupsetneq (\supsetneq)	65	\vcenter	231
\varphi (φ)	99	\varsupsetneq (\supsetneq)	66	\vcrossing (\times)	55
\varphiup (φ)	98	\varsupsetneq (\supsetneq)	66	\VDash (\Vdash)	54
\varphoton (\mathfrak{f})	138	\varsupsetneq (\supsetneq)	66	\VDash (\Vdash)	60
\varpi (ϖ)	97	\varsupsetneq (\supsetneq)	67	\VDash (\Vdash)	58
\varpi (ϖ)	99	\varsupsetneqq (\supsetneqq)	65	\VDash (\Vdash)	56
\varpi (ϖ)	99	\varsupsetneqq (\supsetneqq)	65	\VDash (\Vdash)	62
\varpiup (ϖ)	98	\varsupsetneqq (\supsetneqq)	66	\Vdash (\Vdash)	54
\varpiup (ϖ)	98	\varsupsetneqq (\supsetneqq)	66	\Vdash (\Vdash)	52
\varPluto (\mathbb{P})	133	\varsupsetneqq (\supsetneqq)	66	\Vdash (\Vdash)	60
\varprod (\times)	45	\varsupsetneqq (\supsetneqq)	67	\Vdash (\Vdash)	58
\varprod (\prod)	48	\varsupsetneqq (\supsetneqq)	67	\Vdash (\Vdash)	56
\varprojlim (\varprojlim)	92, 96	\varswarrow (\swarrow)	92	\Vdash (\Vdash)	62
\varproto (∞)	52	\VarTaschenuhr (\mathfrak{t})	183	\Vdash (\Vdash)	54
\varproto (∞)	60	\varTerra (\mathfrak{d})	133	\vDash (\vDash)	52
\varproto (∞)	58	\varthetaeta (ϑ)	97	\vDash (\vDash)	60
\varproto (∞)	56	\varthetaeta (ϑ)	99	\vDash (\vDash)	58
\varproto (∞)	61	\varthetaeta (ϑ)	99	\vDash (\vDash)	56
\varrho (ϱ)	97	\varthetaetaup (ϑ)	98	\vDash (\vDash)	62
\varrho (ϱ)	99	\vartimes (\times)	32	\vdash (\vdash)	62
\varrho (ϱ)	98	\vartimes (\times)	35	\vdash (\vdash)	52
\varrho (ϱ)	99	\vartriangle (\triangle)	124	\vdash (\vdash)	58
\varrhoup (ϱ)	98	\vartriangle (\triangle)	74	\vdash (\vdash)	56
\varrightarrow (\rightarrow)	92	\vartriangle (\triangle)	39, 74	\vdash (\vdash)	60
\varrightwavearrow (\rightsquigarrow)	82	\vartriangle (\triangle)	73	\vdash (\vdash)	58
\Varsampi (\mathcal{P})	159	\vartriangle (\triangle)	74	\vdash (\vdash)	62
\varsampi (\mathcal{P})	159	\vartriangleleft (\triangleleft)	73	\vdotdot (:).	34, 120
\varsearrow (\searrow)	92	\vartriangleleft (\triangleleft)	72	\vdotdot (:).	33, 120
\varsigma (ς)	97	\vartriangleleft (\triangleleft)	74	\vdots ()	120
\varsigma (ς)	99	\vartriangleleft (\triangleleft)	74	\vdots ()	119
\varsigma (ς)	99	\vartriangleleft (\triangleleft)	69, 73	\vdots ()	34
\varsigma (ς)	98	\vartriangleleft (\triangleleft)	74, 149	\vdots ()	120
\varspade (\spadesuit)	151	\vartriangleright (\triangleright)	73	\vdots ()	62
\varspadesuit (\spadesuit)	151	\vartriangleright (\triangleright)	72	\vec{()}.	111
\varspadesuit (\spadesuit)	151	\vartriangleright (\triangleright)	74	\vec{()}.	111
\varsqcap (\sqcap)	35	\vartriangleright (\triangleright)	74	\vec{()}.	111
\varsqcup (\sqcup)	35	\vartriangleright (\triangleright)	69, 73	\vec{()}.	111
\varsqsubsetneq (\sqsubsetneq)	65	\vartriangleright (\triangleright)	74	\vec{()}.	111
\varsqsubsetneqq (\sqsubsetneqq)	65	\vartriangleright (\triangleright)	74	\vec{()}.	110
\varsqsupsetneq (\sqsupsetneq)	65	\varuparrow (\uparrow)	92	\vectimes (\times)	36
\varsqsupsetneqq (\sqsupsetneqq)	65	\varupdownarrow (\Downarrow)	92	\Vee (\Vee)	35
\varstar (*)	33	\varupdownarrowwavearrow (\Downarrow)	82	\Vee (\Vee)	36
\varstar (*)	149	\varupwavearrow (\uparrow)	82	\vee (\vee)	33
\varstigma (\mathfrak{s})	159	\varvarpi (ϖ)	98	\vee (\vee)	31
\varsubsetneq (\subsetneq)	65	\varvarpi (ϖ)	98	\vee (\vee)	35
\varsubsetneqq (\subsetneqq)	65	\varvarrho (ϱ)	98	\vee (\vee)	34, 35

\vee (v)	33
\vee (v)	36
\veebar (⊻)	33
\veebar (⊲)	31
\veebar (⊳)	35
\veebar (⊴)	34
\veebar (⊵)	36
\veedot (v)	34
\veedot (v)	33
\veedot (v)	36
\veedoublebar (⊻)	33
\veedoublebar (⊳)	34
\veedoublebar (⊴)	36
\veeq (⊻)	60
\veeq (⊳)	58
\veeq (⊴)	62
\veemidvert (v)	36
\veeodot (v̂)	36
\veeonvee (w̄)	35
\veeonvee (w̄)	35
\veeonvee (w̄)	36
\veeonwedge (x̄)	62
\Venus (♀)	132
\Venus (♀)	133
\Venus (♀)	132
\venus (♀)	131
\vernal (↑)	131
versicle (V̄)	245, 246
\VERT ()	109
\Vert ()	103–105
\Vert ()	106
\Vert ()	107
\Vert ()	108
\vert ()	103–105
\vert ()	106
\vert ()	107
\vert ()	108
\vertbowtie (x̄)	34
\vertdiv (·+)	34
\Vertex (V̄)	133
\vertoverlay ()	62
\Vesta (ϝ)	133
\VHF (≈)	130
\Vier (♩)	165
vietnam (package)	247
\viewdata (#)	126
\Village (⌂)	183
\vin (J)	103
vinculum	see \overline
\ViPa (ξ)	165
virga	see musixgre
\Virgo (♍)	133
\Virgo (♍)	132
\virgo (♍)	131
\vlongdash (—)	58
\vlongdash (—)	62
\VM (>)	165
\vntex (package)	16, 21
\vod (y)	20
\voicedh (fi)	20
\Vomey (⌚)	196
\vppm (⋮)	188
\vpppm (⋮)	188
\vrectangle (□)	149
\vrectangleblack (■)	149
\vrule	190
\VT (σ)	135
\Vulkanus (ꝫ)	133
\vv (⤒)	115
\VvDash (⊧)	53
\Vvdash (⊧)	54
\Vvdash (⊧)	52
\Vvdash (⊧)	60
\Vvdash (⊧)	58
\Vvdash (⊧)	55
\Vvdash (⊧)	62
\Vvert ()	107
\Vvert ()	108
\vvvert ()	104
\vysmblkcircle (•)	40
\vysmblksquare (•)	149
\vysmwhtcircle (◦)	40
\vysmwhtsquare (◦)	149
\vzigzag (⤓)	126
W	
w (ƿ)	162
\Walley (ᗩ)	196
\warning (Δ)	196
\WashCotton (Ѡ)	182
\WashSynthetics (Ѡ)	182
\WashWool (Ѡ)	182
\wasyllozenge (☒)	181
\wasypyropto (∞)	53
\wasysym (package)	20, 26, 28, 32, 43, 53, 65, 68, 119, 124, 130, 131, 133, 136, 143, 144, 146, 163, 181, 227, 247
\wasytherefore (∴)	119
\Water (∇)	133
\water (●)	138
wavy-line delimiters	104–108
\wbetter (±)	186
\Wboson (W)	138
\Wbosonminus (W⁻)	138
\Wbosonplus (W⁺)	138
\wdecisive (+-)	186
\weakpt (×)	186
\WeakRain (܂)	183
\WeakRainCloud (܂)	183
weather symbols	183, 197–198
Web symbols	199–202
webomints (package)	209, 210, 247
\Wecker (⌚)	183
\Wedge (Ⓐ)	35
\Wedge (Ⓐ)	36
\wedge (∧)	33
\wedge (∧)	31
\wedge (∧)	35
\wedge (∧)	34, 35
\wedge (∧)	34
\wedge (∧)	36
\wedgebar (△)	36
\wedgedot (Ⓐ)	34
\wedgedot (Ⓐ)	34
\wedgedot (Ⓐ)	36
\wedgedoublebar (△)	36
\wedgemidvert (▲)	36
\wedgeodot (◊)	36
\wedgeonwedge (Ⓜ)	35
\wedgeonwedge (Ⓜ)	36
\wedgeq (⊻)	58
\wedgeq (⊻)	62
Weierstrass φ function	see \wp
\westcross (‡)	143
\wfermion (⧈)	137
\Wheelchair (♿)	182
\whfermion (==)	137
\whistle (⤒)	23
\white	188
\whitearrowupfrombar (⤔)	87
\whitearrowupfrombar (⤔)	89
\whitearrowuppedestal (⤔)	87
\whitearrowuppedestalhbar (⤔)	87
\whitearrowuppedestalvbar (⤔)	87
\WhiteBishopOnBlack (♝)	187
\WhiteBishopOnWhite (♝)	187
\WhiteKingOnBlack (♚)	187
\WhiteKingOnWhite (♚)	187
\WhiteKnightOnBlack (♞)	187
\WhiteKnightOnWhite (♞)	187

\XY-pic	233	
Y		
\Ydown (γ)	32	
\Ydown (γ)	35	
yen	<i>see \textyen</i>	
\yen (¥)	126	
yfonts (package)	128, 129, 247	
ymath (package)	112, 113, 115, 121, 234, 247	
yin-yang symbols	182, 196–198, 210–211	
\Yinyang (☯)	182	
\yinyang (☯)	196	
\Yleft (⟨)	32	
\Yleft (⟨)	35	
\yogh (ȝ)	20	
\yogh (ȝ)	19	
\Yright (⟩)	32	
\Yright (⟩)	35	
Yu, Billy	235	
\Yup (ʌ)	32	
\Yup (ʌ)	35	
\Yup (ʌ)	101	
Z		
\ZA (Ⓐ)	134	
Zapf Chancery (font)	128	
Zapf Dingbats (font)	139, 144	
\ZB (Ⓑ)	134	
\Zbar (ⓧ)	101	
\Zborder (ⓧ)	152	
\Zboson (ⓧ)	138	
\ZC (Ⓒ)	134	
\zcmp (§)	126	
\ZD (Ⓓ)	134	
\ZE (Ⓔ)	134	
\Zeta (Ζ)	97	
\zeta (ζ)	97	
\zetaup (ζ)	98	
\Zeus (ⴵ)	133	
\ZF (Ⓕ)	134	
\ZG (Ⓖ)	134	
\ZH (Ⓗ)	134	
\ZI (Ⓘ)	134	
\ZJ (ᴶ)	134	
\ZK (𝑲)	134	
\ZL (Ⓛ)	134	
\ZM (Ⓜ)	134	
\ZN (Ⓝ)	134	
\ZO (⓽)	134	
\Zodiac	132	
zodiacal symbols	131–133, 206–209	
\ZP (Ⓟ)	134	
\zpipe (⣠)	126	
\zproject (⣡)	126	
\ZQ (⓽)	134	
\ZR (Ⓡ)	134	
\ZS (Ⓢ)	134	
\ZT (Ⓣ)	134	
\Ztransf (●↔○)	64	
\Ztransf (●↔○)	60	
\ztransf (○↔●)	64	
\ztransf (○↔●)	60	
\ZU (Ⓨ)	134	
\zugzwang (○)	186	
\ZV (⓭)	134	
\ZW (⓮)	134	
\Zwdr (♪)	165	
\ZwPa (♩)	165	
\ZX (⓯)	134	
\ZY (⓯)	134	
\ZZ (⓯)	134	