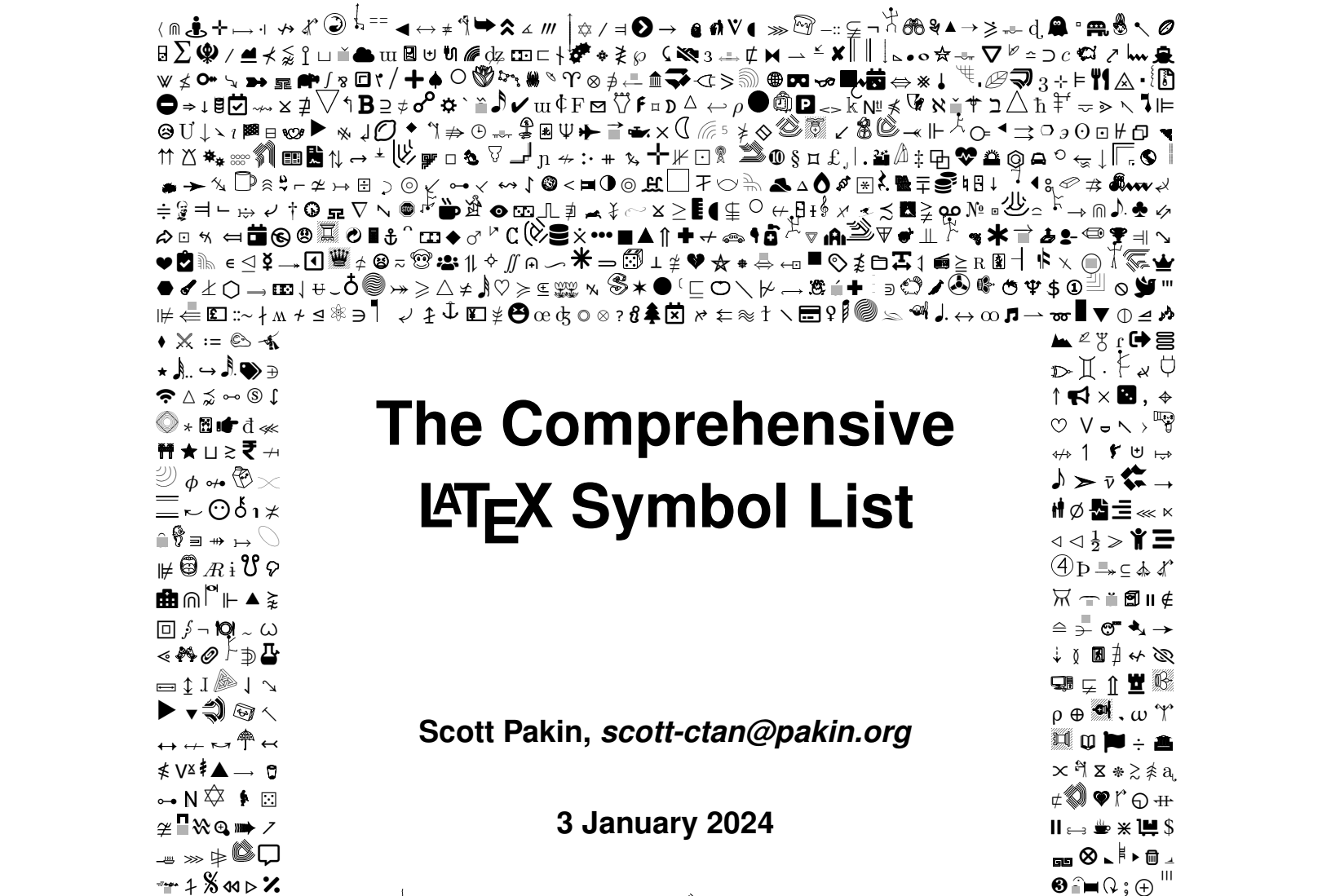

The Comprehensive LaTeX Symbol List

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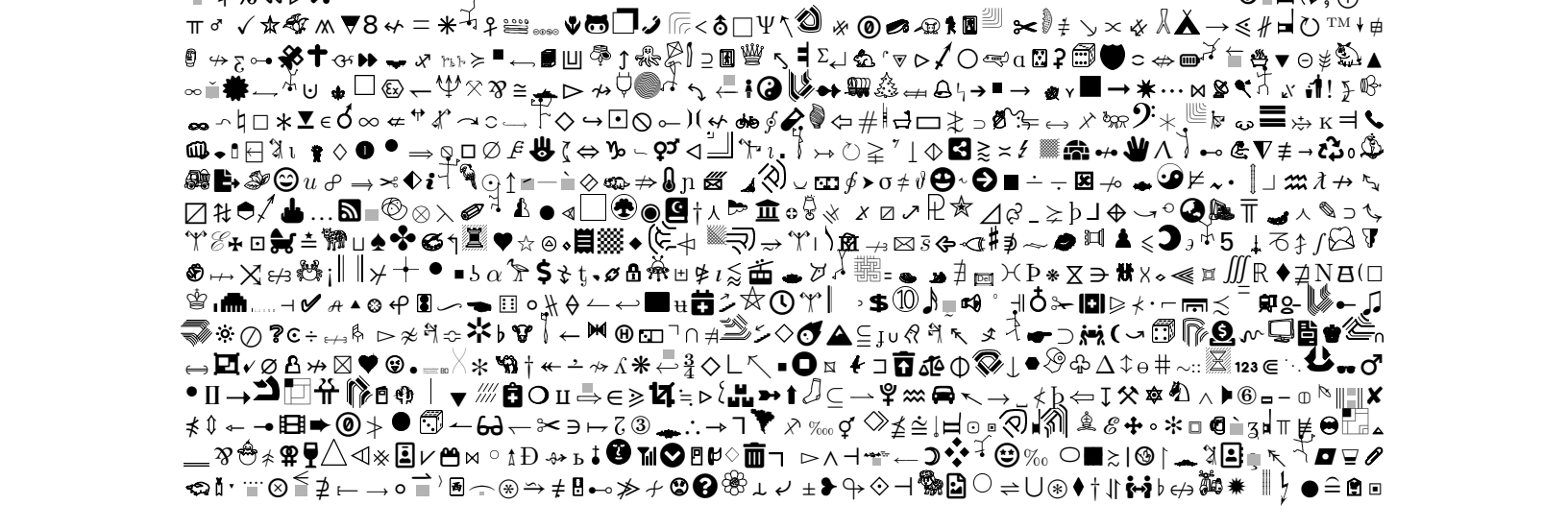

Abstract

This document lists 20323 symbols and the corresponding LaTeX commands that produce them. Some of these symbols are guaranteed to be available in every LaTeX 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 TeX Archive Network (`https://www.ctan.org/`).

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Chapter 1

Introduction

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

1. They are freely available from the Comprehensive TeX Archive Network (`https://www.ctan.org/`).
2. All of their symbols have LaTeX 2_ε bindings. That is, a user should be able to access a symbol by name (e.g., `\bigtriangleup`)

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

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

1.1 Document Usage

Each chapter of this document contains a number of font tables. Each table shows a set of symbols, with the corresponding LaTeX command to the right of each symbol. A table's caption indicates what package needs to be loaded in order to access that table's symbols. For example, the symbols in Table 46, "textcomp Old-Style Numerals", are made available by putting "`\usepackage{textcomp}`" in your document's preamble. "$\mathcal{AMS}$" means to use the $\mathcal{AMS}$ packages, viz. amssymb and/or amsmath. Notes below a table provide additional information about some or all the symbols in that table.

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

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

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

1.2 Frequently Requested Symbols

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

␣, as in "Spaces␣are␣significant." 19
ī, ĩ, ī́, ǐ, ĭ, etc. (versus ī, ĩ, ī́, ǐ, and ĭ) 26
¢ 31
€ 32
©, ®, and ™ 33
‰ 34
ﬀ 56
∴ 68
≔ and ⩴ 69
≲ and ≳ 85
⋰ 153
°, as in "180°" or "15°C" 160
$\mathscr{L}$, $\mathscr{F}$, etc. 162
ℕ, ℤ, ℝ, etc. 162
$\mathscr{e}$ 162
ſ 371
á̋, ề, etc. (i.e., several accents per character) 373
<, >, and | (instead of ¡, ¿, and —) 381
ˆ and ˜ (or ∼) 382

Chapter 2

Body-text symbols

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

TABLE 1: LaTeX 2_ε 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 LaTeX 2ε Text-mode Commands

ˆ		\textasciicircum*	<		\textless
˜		\textasciitilde*	ª	a	\textordfeminine
*	*	\textasteriskcentered	º	o	\textordmasculine
\		\textbackslash	¶	¶	\textparagraph†
|		\textbar	·	·	\textperiodcentered
‖	‖	\textbardbl	‱	‱	\textpertenthousand
◯	◯	\textbigcircle	‰	‰	\textperthousand
{		\textbraceleft†	¿		\textquestiondown
}		\textbraceright†	“		\textquotedblleft
•	•	\textbullet	”		\textquotedblright
©	©	\textcopyright†	‘		\textquoteleft
†	†	\textdagger†	’		\textquoteright
‡	‡	\textdaggerdbl†	®	®	\textregistered
$	$	\textdollar†	§	§	\textsection†
…		\textellipsis†	£	£	\textsterling†
—		\textemdash	™	™	\texttrademark
–		\textendash	_		\textunderscore†
¡		\textexclamdown	␣		\textvisiblespace
>		\textgreater			

The first symbol column represents the—sometimes “faked”—symbol that LaTeX 2ε provides by default. The second symbol column represents the symbol as redefined by textcomp (if textcomp redefines it). The textcomp package is generally required to typeset Table 2’s symbols in italic, and some symbols additionally require the T1 font encoding for italic.

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

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

Table 3: LaTeX 2ε 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 LaTeX 2ε provides by default. The second symbol column represents the symbol as redefined by textcomp (if textcomp redefines it). The textcomp package is generally required to typeset Table 3’s symbols in italic, and some symbols additionally require the T1 font encoding for italic.

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

✓ \checkmark ® \circledR ✠ \maltese

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

å	\aa	Ð	\DH*	Ł	\L	ø	\o	þ	\th*
Å	\AA	Đ	\DJ*	ł	\l	œ	\oe	Þ	\TH*
Æ	\AE	đ	\dj*	Ŋ	\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	\textalpha	η	\texteta	ν	\textnu	τ	\texttau
β	\textbeta	ϑ	\texttheta	ξ	\textxi	υ	\textupsilon
γ	\textgamma	ι	\textiota	ο	\textomikron	φ	\textphi
δ	\textdelta	ϰ	\textkappa	π	\textpi	χ	\textchi
ε	\textepsilon	λ	\textlambda	ρ	\textrho	ψ	\textpsi
ζ	\textzeta	μ	\textmu*	σ	\textsigma	ω	\textomega
A	\textAlpha	H	\textEta	N	\textNu	T	\textTau
B	\textBeta	Θ	\textTheta	Ξ	\textXi	ϒ	\textUpsilon
Γ	\textGamma	I	\textIota	O	\textOmikron	Φ	\textPhi
Δ	\textDelta	K	\textKappa	Π	\textPi	X	\textChi
E	\textEpsilon	Λ	\textLambda	P	\textRho	Ψ	\textPsi
Z	\textZeta	M	\textMu	Σ	\textSigma	Ω	\textOmega

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

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

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

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

Table 7: Letters Used to Typeset African Languages

Đ	\B{D}	ƈ	\m{c}	ʃ	\m{f}	ƙ	\m{k}	ƫ	\M{t}	ȝ	\m{Z}
đ	\B{d}	Ɗ	\m{D}	Ƒ	\m{F}	Ɲ	\m{N}	Ƭ	\M{T}	Ɛ̃	\T{E}
Ħ	\B{H}	ɖ	\M{d}	Ɣ	\m{G}	ŋ	\m{n}	ƭ	\m{t}	ɛ̃	\T{e}
ħ	\B{h}	Ð	\M{D}	ɣ	\m{g}	ɔ	\m{o}	Ʈ	\m{T}	Ɔ̃	\T{O}
ŧ	\B{t}	ƌ	\m{d}	Ɩ	\m{I}	Ɔ	\m{O}	ʊ	\m{u}*	ɔ̃	\T{o}
Ŧ	\B{T}	Ɛ	\m{E}	ɩ	\m{i}	Ƥ	\m{P}	Ʊ	\m{U}*		
ɓ	\m{b}	ɛ	\m{e}	Ɲ	\m{J}	ƥ	\m{p}	Ƴ	\m{Y}		
Ɓ	\m{B}	Ǝ	\M{E}	ɲ	\m{j}	ʃ	\m{s}	ƴ	\m{y}		
Ƈ	\m{C}	ə	\M{e}	Ƙ	\m{K}	Ʃ	\m{S}	ʒ	\m{z}		

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

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

Table 8: Letters Used to Typeset Vietnamese

Ơ	\OHORN	ơ	\ohorn	Ư	\UHORN	ư	\uhorn

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

Table 9: Punctuation Marks Not Found in OT1

«	\guillemetleft*	‹	\guilsinglleft	„	\quotedblbase
»	\guillemetright*	›	\guilsinglright	,	\quotesinglbase

" \textquotedbl

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

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

Table 10: pifont Decorative Punctuation Marks

❛	\ding{123}	❝	\ding{125}	❡	\ding{161}
❜	\ding{124}	❞	\ding{126}	❢	\ding{162}

❣ \ding{163}

Table 11: fontawesome5 Decorative Punctuation Marks and Typographic Symbols

✱	\faAsterisk	!	\faExclamation	❞	\faQuoteRight
@	\faAt	¶	\faParagraph	\	\faSlash
•••	\faEllipsisH	?	\faQuestion		
⋮	\faEllipsisV	❝	\faQuoteLeft		

Table 12: tipa Phonetic Symbols

ɤ	\textbabygamma	ʔ	\textglotstop	ɳ	\textrtailn
ƀ	\textbarb	ˑ	\texthalflength	ɽ	\textrtailr
ȼ	\textbarc	ъ	\texthardsign	ʂ	\textrtails
đ	\textbard	ʻ	\texthooktop	ʈ	\textrtailt
ɟ	\textbardotlessj	ɓ	\texthtb	ʐ	\textrtailz
ǥ	\textbarg	ʄ	\texthtbardotlessj	˞	\textrthook
ʔ	\textbarglotstop	ƈ	\texthtc	ʌ	\textsca
ɨ	\textbari	ɗ	\texthtd	ʙ	\textscb
ɬ	\textbarl	ɠ	\texthtg	ɛ	\textsce
ɵ	\textbaro	ɦ	\texthth	ɢ	\textscg
ʕ	\textbarrevglotstop	ʯ	\texththeng	ʜ	\textsch
ʉ	\textbaru	ƙ	\texthtk	ə	\textschwa
ɬ	\textbeltl	ɸ	\texthtp	ɪ	\textsci
β	\textbeta	ʠ	\texthtq	ʝ	\textscj
ʘ	\textbullseye	ɖ	\texthtrtaild	ʟ	\textscl
ˊ	\textceltpal	ƈ	\texthtscg	ɴ	\textscn
χ	\textchi	ƭ	\texthtt	œ	\textscoelig
ɔ	\textcloseepsilon	ʰ	\texthvlig	ɷ	\textscomega
ɷ	\textcloseomega	ƅ	\textinvglotstop	ʀ	\textscr
ɜ	\textcloserevepsilon	ʁ	\textinvscr	ɑ	\textscripta
ʒ	\textcommatailz	ɩ	\textiota	ɡ	\textscriptg
˥	\textcorner	ʎ	\textlambda	ʊ	\textscriptv
ƀ	\textcrb	ː	\textlengthmark	ᴜ	\textscu
đ	\textcrd	ƫ	\textlhookt	ʏ	\textscy
ǥ	\textcrg	ɭ	\textlhtlongi	ˌ	\textsecstress
ħ	\textcrh	ʯ	\textlhtlongy	ь	\textsoftsign
ƅ	\textcrinvglotstop	ɼ	\textlonglegr	ʗ	\textstretchc
ƛ	\textcrlambda	˂	\textlptr	ʦ	\texttctclig
ƻ	\textcrtwo	ɱ	\textltailm	ʧ	\textteshlig
ȼ	\textctc	ɲ	\textltailn	ϑ	\texttheta
ȡ	\textctd	ɬ	\textltilde	þ	\textthorn
ʣ	\textctdctzlig	ɮ	\textlyoghlig	ǀ	\texttoneletterstem
ʃ	\textctesh	ɟ	\textObardotlessj	ʦ	\texttslig

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ʝ	\textctj	ɮ	\textOlyoghlig	ɐ	\textturna
ɳ	\textctn	ω	\textomega	œ	\textturncelig
ʇ	\textctt	⌜	\textopencorner	ɥ	\textturnh
ʨ	\textcttctclig	ɔ	\textopeno	ʞ	\textturnk
ʒ	\textctyogh	ˌ	\textpalhook	ʃ	\textturnlonglegr
ʑ	\textctz	φ	\textphi	ɯ	\textturnm
ʤ	\textdctzlig	|	\textpipe	ɯ	\textturnmrleg
ʩ	\textdoublebaresh	ˈ	\textprimstress	ɹ	\textturnr
ǂ	\textdoublebarpipe	ʔ	\textraiseglotstop	ɻ	\textturnrrtail
≠	\textdoublebarslash	ɺ	\textraisevibyi	ɒ	\textturnscripta
‖	\textdoublepipe	ɤ	\textramshorns	ɾ	\textturnt
‖	\textdoublevertline	ʿ	\textrevapostrophe	ʌ	\textturnv
↓	\textdownstep	ɘ	\textreve	ʍ	\textturnw
ʤ	\textdyoghlig	ɜ	\textrevepsilon	ʎ	\textturny
ʣ	\textdzlig	ʕ	\textrevglotstop	ʊ	\textupsilon
ɛ	\textepsilon	ʒ	\textrevyogh	↑	\textupstep
ʃ	\textesh	ɜʳ	\textrhookrevepsilon	|	\textvertline
ɾ	\textfishhookr	ɚ	\textrhookschwa	ɺ	\textvibyi
g	\textg	˞	\textrhoticity	ʯ	\textvibyy
ɣ	\textgamma	>	\textrptr	ƿ	\textwynn
↘	\textglobfall	ɖ	\textrtaild	ʒ	\textyogh
↗	\textglobrise	ɭ	\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 13: tipx Phonetic Symbols

ɶ	\textaolig	ʃ	\texthtbardotlessjvar	˔	\textrthooklong
ʒ	\textbenttailyogh	ɷ	\textinvomega	ᴅ	\textscaolig
ɣ	\textbktailgamma	ʌ	\textinvsca	ᴀ	\textscdelta
ʖ	\textctinvglotstop	ɑ	\textinvscripta	ꜰ	\textscf
ʝ	\textctjvar	ɬ	\textlfishhookrlig	ᴋ	\textsck
ʗ	\textctstretchc	ɟ	\textlhookfour	ᴍ	\textscm
ɕ	\textctstretchcvar	ƥ	\textlhookp	ᴘ	\textscp
ʇ	\textctturnt	ɪ	\textlhti	ǫ	\textscq
ʤ	\textdblig	ɻ	\textlooptoprevesh	←	\textspleftarrow
ǂ	\textdoublebarpipevar	ɳ	\textnrleg	ɕ	\textstretchcvar
‖	\textdoublepipevar	⊙	\textObullseye	↔	\textsubdoublearrow

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↓	\textdownfullarrow	⸽	\textpalhooklong	→	\textsubrightarrow
⚲	\textfemale	⸾	\textpalhookvar	ⱀ	\textthornvari
ⱡ	\textfrbarn	⸿	\textpipevar	ⱀ	\textthornvarii
ⱡ	\textfrhookd	ⱷ	\textqplig	ⱀ	\textthornvariii
ⱡ	\textfrhookdvar	ⱸ	\textrectangle	ⱀ	\textthornvariv
ⱡ	\textfrhookt	ⱹ	\textretractingvar	ⱬ	\textturnglotstop
ⱄ	\textfrtailgamma	ⱺ	\textrevscl	Ɱ	\textturnsck
ⱄ	\textglotstopvari	ⱻ	\textrevscr	ⱺ	\textturnscu
ⱄ	\textglotstopvarii	ⱼ	\textrhooka	ⱻ	\textturnthree
ⱄ	\textglotstopvariii	ⱽ	\textrhooke	ⱽ	\textturntwo
ⱄ	\textgrgamma	ⱽ	\textrhookepsilon	ⱽ	\textuncrfemale
ⱅ	\textheng	Ȿ	\textrhookopeno	↑	\textupfullarrow
ⱅ	\texthmlig	Ɀ	\textrtailhth		

Table 14: wsuipa Phonetic Symbols

ⱀ	\babygamma	ŋ	\eng	ɱ	\labdentalnas	ə	\schwa
ⱀ	\barb	ɚ	\er	ɬ	\latfric	ɪ	\sci
ⱀ	\bard	ʃ	\esh	ɰ	\legm	ɴ	\scn
ⱀ	\bari	ð	\eth	ɽ	\legr	ʀ	\scr
ⱀ	\barl	ɾ	\flapr	ɮ	\lz	ɑ	\scripta
ⱀ	\baro	ʔ	\glotstop	ɑ	\nialpha	ɡ	\scriptg
ⱀ	\barp	ɓ	\hookb	β	\nibeta	ʋ	\scriptv
ⱀ	\barsci	ɗ	\hookd	χ	\nichi	ʊ	\scu
ⱀ	\barscu	ɠ	\hookg	ɛ	\niepsilon	ʏ	\scy
ⱀ	\baru	ɦ	\hookh	γ	\nigamma	ⱀ	\slashb
⊙	\clickb	ɧ	\hookheng	ι	\niiota	ⱀ	\slashc
ⱀ	\clickc	ɝ	\hookrevepsilon	λ	\nilambda	ⱀ	\slashd
ⱀ	\clickt	ɦ	\hv	ω	\niomega	ⱀ	\slashu
ⱀ	\closedniomega	ⱀ	\inva	φ	\niphi	ⱀ	\taild
ⱀ	\closedrevepsilon	ⱀ	\invf	σ	\nisigma	ⱀ	\tailinvr
ⱀ	\crossb	ⱀ	\invglotstop	θ	\nitheta	ⱀ	\taill
ⱀ	\crossd	ⱀ	\invh	ʊ	\niupsilon	ⱀ	\tailn
ⱀ	\crossh	ⱀ	\invlegr	ɲ	\nj	ⱀ	\tailr
ⱀ	\crossnilambda	ⱀ	\invm	ɷ	\oo	ⱀ	\tails
ⱀ	\curlyc	ⱀ	\invr	ɔ	\openo	ⱀ	\tailt
ⱀ	\curlyesh	ⱀ	\invscr	ɘ	\reve	ⱀ	\tailz

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ʒ	\curlyyogh	ɒ	\invscripta	ʕ	\reveject	ʧ	\tesh
ʑ	\curlyz	ʌ	\invv	ɜ	\revepsilon	þ	\thorn
ɬ	\dlbari	ʍ	\invw	ʕ	\revglotstop	ŧ	\tildel
ʤ	\dz	ʎ	\invy	ᴅ	\scd	ȝ	\yogh
ʔ	\ejective	ɣ	\ipagamma	ɢ	\scg		

Table 15: wasysym Phonetic Symbols

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

Table 16: phonetic Phonetic Symbols

ɟ	\barj	ɾ	\flap	ɨ	\ibar	ɒ	\rotvara	ι	\vari
ƛ	\barlambda	ʔ	\glottal	ɔ	\openo	ʍ	\rotw	ω	\varomega
ŋ	\emgma	Ɓ	\hausaB	ħ	\planck	ʎ	\roty	ɔ	\varopeno
ŋ	\engma	ɓ	\hausab	ʌ	\pwedge	ə	\schwa	ⱱ	\vod
ɲ	\enya	ɗ	\hausad	Ɖ	\revD	þ	\thorn	ﬁ	\voicedh
ɛ	\epsi	Ɗ	\hausaD	ɹ	\riota	ʉ	\ubar	ȝ	\yogh
ʃ	\esh	ƙ	\hausak	ɯ	\rotm	ụ	\udesc		
ð	\eth	Ƙ	\hausaK	ʊ	\rotOmega	ɑ	\vara		
ﬂ	\fj	ƈ	\hookd	ɹ	\rotr	ɡ	\varg		

Table 17: t4phonet Phonetic Symbols

đ	\textcrd	ƈ	\texthtd	|	\textpipe
ħ	\textcrh	ƙ	\texthtk	ɖ	\textrtaild
ɛ	\textepsilon	ƥ	\texthtp	ʈ	\textrtailt
ʃ	\textesh	ƭ	\texthtt	ƈ	\textschwa
ﬂ	\textfjlig	ι	\textiota	ʃ	\textscriptv
ɓ	\texthtb	ɲ	\textltailn	ʧ	\textteshlig
ƈ	\texthtc	ɔ	\textopeno	ʒ	\textyogh

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

Table 18: semtrans Transliteration Symbols

ʾ	\Alif	ʿ	\Ayn

Table 19: Text-mode Accents

Ää	`\"{A}\"{a}`	Åȧ	`|{A}|{a}`‡	Ât̂	`\f{A}\f{a}`¶	A͡a͡	`\t{A}\t{a}`
Áá	`\'{A}\'{a}`	Ãã	`\~{A}\~{a}`	Ää	`\G{A}\G{a}`‡	Ăă	`\u{A}\u{a}`
Ȧȧ	`\.{A}\.{a}`	A̲a̲	`\b{A}\b{a}`	Åẖ	`\h{A}\h{a}`§	Ää	`\U{A}\U{a}`‡
Āā	`\={A}\={a}`	Ąą	`\c{A}\c{a}`	Őő	`\H{A}\H{a}`	Ää	`\U{A}\U{a}`¶
Ât̂	`\^{A}\^{a}`	C̀c̀	`\C{A}\C{a}`¶	Ąą	`\k{A}\k{a}`†	Ăă	`\v{A}\v{a}`
Àà	`\‘{A}\‘{a}`	Ạạ	`\d{A}\d{a}`	Åå	`\r{A}\r{a}`		

Ât̂ `\newtie{A}\newtie{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.

‖ See also the circledsteps package, which uses Ti*k*Z to encircle symbols of any size.

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

Table 20: tipa Text-mode Accents

Á́á́	`\textacutemacron{A}\textacutemacron{a}`
Á̋á̋	`\textacutewedge{A}\textacutewedge{a}`
A̪a̪	`\textadvancing{A}\textadvancing{a}`
A͡a͡	`\textbottomtiebar{A}\textbottomtiebar{a}`
Ă̱ă̱	`\textbrevemacron{A}\textbrevemacron{a}`
Ãã	`\textcircumacute{A}\textcircumacute{a}`
Å̂å̂	`\textcircumdot{A}\textcircumdot{a}`

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Ǎǎ \textdotacute{A}\textdotacute{a}
Ȧȧ \textdotbreve{A}\textdotbreve{a}
Ȁȁ \textdoublegrave{A}\textdoublegrave{a}
A̋a̋ \textdoublevbaraccent{A}\textdoublevbaraccent{a}
Ãã \textfallrise{A}\textfallrise{a}
Ȃȃ \textgravecircum{A}\textgravecircum{a}
Ȧ̀ȧ̀ \textgravedot{A}\textgravedot{a}
Ā̀ā̀ \textgravemacron{A}\textgravemacron{a}
Ȧ̀ȧ̀ \textgravemid{A}\textgravemid{a}
Áá \texthighrise{A}\texthighrise{a}
A͕a͕ \textinvsubbridge{A}\textinvsubbridge{a}
A̗a̗ \textlowering{A}\textlowering{a}
Ȧ̗ȧ̗ \textlowrise{A}\textlowrise{a}
Áá \textmidacute{A}\textmidacute{a}
Ǎǎ \textovercross{A}\textovercross{a}
A̍a̍ \textoverw{A}\textoverw{a}
Ąą \textpolhook{A}\textpolhook{a}
A̝a̝ \textraising{A}\textraising{a}
A̞a̞ \textretracting{A}\textretracting{a}
Åå \textringmacron{A}\textringmacron{a}
Ȃ̌ȃ̌ \textrisefall{A}\textrisefall{a}
Ȃ̂ȃ̂ \textroundcap{A}\textroundcap{a}
A̼a̼ \textseagull{A}\textseagull{a}
Á̗á̗ \textsubacute{A}\textsubacute{a}
Â̗â̗ \textsubarch{A}\textsubarch{a}
A̲a̲ \textsubbar{A}\textsubbar{a}
A̪a̪ \textsubbridge{A}\textsubbridge{a}
A̭a̭ \textsubcircum{A}\textsubcircum{a}
Ạạ \textsubdot{A}\textsubdot{a}
À̗à̗ \textsubgrave{A}\textsubgrave{a}
A̬a̬ \textsublhalfring{A}\textsublhalfring{a}
A̗+a̗+ \textsubplus{A}\textsubplus{a}
A̹a̹ \textsubrhalfring{A}\textsubrhalfring{a}
Ḁḁ \textsubring{A}\textsubring{a}
A̺a̺ \textsubsquare{A}\textsubsquare{a}
A̰a̰ \textsubtilde{A}\textsubtilde{a}

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A̤a̤	`\textsubumlaut{A}\textsubumlaut{a}`
A̰a̰	`\textsubw{A}\textsubw{a}`
A̬a̬	`\textsubwedge{A}\textsubwedge{a}`
A̸a̸	`\textsuperimposetilde{A}\textsuperimposetilde{a}`
A̩a̩	`\textsyllabic{A}\textsyllabic{a}`
Ã̰ã̰	`\texttildedot{A}\texttildedot{a}`
A͡a͡	`\texttoptiebar{A}\texttoptiebar{a}`
À̬à̬	`\textvbaraccent{A}\textvbaraccent{a}`

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

Table 21: extraipa Text-mode Accents

A̪a̪	`\bibridge{A}\bibridge{a}`
A̋a̋	`\crtilde{A}\crtilde{a}`
Ã̤ã̤	`\dottedtilde{A}\dottedtilde{a}`
Ã̰ã̰	`\doubletilde{A}\doubletilde{a}`
A̬a̬	`\finpartvoice{A}\finpartvoice{a}`
Ḁḁ	`\finpartvoiceless{A}\finpartvoiceless{a}`
A̰a̰	`\inipartvoice{A}\inipartvoice{a}`
Å̰å̰	`\inipartvoiceless{A}\inipartvoiceless{a}`
A̅a̅	`\overbridge{A}\overbridge{a}`
A̰̬a̰̬	`\partvoice{A}\partvoice{a}`
A̰̥a̰̥	`\partvoiceless{A}\partvoiceless{a}`
A⃡a⃡	`\sliding{A}\sliding{a}`
A͍a͍	`\spreadlips{A}\spreadlips{a}`
A̪a̪	`\subcorner{A}\subcorner{a}`
A̪a̪	`\subdoublebar{A}\subdoublebar{a}`
A̬̬a̬̬	`\subdoublevert{A}\subdoublevert{a}`
A̠a̠	`\sublptr{A}\sublptr{a}`
A̠a̠	`\subrptr{A}\subrptr{a}`
A̠a̠	`\whistle{A}\whistle{a}`

Table 22: wsuipa Text-mode Accents

A̪a̪	`\dental{A}\dental{a}`
A̠a̠	`\underarch{A}\underarch{a}`

Table 23: phonetic Text-mode Accents

A͡a	`\hill{A}\hill{a}`	A̪a̪	`\rc{A}\rc{a}`	A͜a	`\ut{A}\ut{a}`
A͒a͒	`\od{A}\od{a}`	A̬a̬	`\syl{A}\syl{a}`		
Â͡a	`\ohill{A}\ohill{a}`	A̤a̤	`\td{A}\td{a}`		

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

Table 24: metre Text-mode Accents

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

Table 25: t4phonet Text-mode Accents

Ää	`\textdoublegrave{A}\textdoublegrave{a}`
Åå	`\textvbaraccent{A}\textvbaraccent{a}`
Ää	`\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 19 on the next page) but using the same names as the tipa accents presented in Table 20 on page 26.

Table 26: arcs Text-mode Accents

$\widehat{A\,a}$ `\overarc{A}\overarc{a}` $\underbrace{A\,a}$ `\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 XeTeX mailing list (Subject: "The arcs package", dated 2013/08/25) to prevent spurious text from being added to the document (as in, "5.0pt$\widehat{A}$" when "$\widehat{A}$" is expected).

Table 27: semtrans Accents

$\ddot{A}\ddot{a}$ `\D{A}\D{a}` $\breve{A}\breve{a}$ `\U{A}\U{a}`

$\forall\text{ɐ}$ `\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 28: ogonek Accents

Ą ą `\k{A}\k{a}`

Table 29: combelow Accents

Ạ ạ `\cb{A}\cb{a}`

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

Table 30: wsuipa Diacritics

ʿ	\ain	˂	\leftp	◌̊	\overring	ˈ	\stress	◌̬	\underwedge
˥	\corner	˩	\leftt	◌̡	\polishhook	◌̩	\syllabic	◌̯	\upp
˅	\downp	ː	\length	˃	\rightp	◌̤	\underdots	⊥	\upt
⊤	\downt	~	\midtilde	⊢	\rightt	◌̥	\underring		
ˈ	\halflength	◌ʿ	\open	◌ˈ	\secstress	◌̰	\undertilde		

The wsuipa package defines all of the above as ordinary characters, not as accents. However, it does provide \diatop and \diaunder commands, which are used to compose diacritics with other characters. For example, \diatop[\overring|a] produces "å", and \diaunder[\underdots|a] produces "a̤". See the wsuipa documentation for more information.

Table 31: textcomp Diacritics

◌̋	\textacutedbl	◌̌	\textasciicaron	◌̄	\textasciimacron
◌́	\textasciiacute	◌̈	\textasciidieresis	◌̏	\textgravedbl
◌̆	\textasciibreve	◌̀	\textasciigrave		

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

Table 32: marvosym Diacritics

◌⃗	\arrowOver	◌̄	\barOver	/	\StrikingThrough
◌⃗	\ArrowOver	◌̿	\BarOver		

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

Table 33: textcomp Currency Symbols

฿	\textbaht	$	\textdollar*	₲	\textguarani	₩	\textwon
¢	\textcent	$	\textdollaroldstyle	£	\textlira	¥	\textyen
¢	\textcentoldstyle	₫	\textdong	₦	\textnaira		
₡	\textcolonmonetary	€	\texteuro	₱	\textpeso		
¤	\textccurrency	f	\textflorin	£	\textsterling*		

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

Table 34: marvosym Currency Symbols

ℛ	\Denarius	€	\EURcr	€	\EURtm	₸	\Pfund
℮	\Ecommerce	€	\EURdig	$	\EyesDollar	ß	\Shilling
€	\EUR	€	\EURhv	ƒ	\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 320 (\EURdig). The mathdesign package redefines \texteuro to be visually compatible with one of three additional fonts: Utopia (€), Charter (€), or Garamond (€).

Table 35: fontawesome5 Currency Symbols

฿	\faBtc	₺	\faLiraSign	₪	\faShekelSign	¥	\faYenSign
$	\faDollarSign	£	\faPoundSign	₸	\faTenge		
€	\faEuroSign	₽	\faRubleSign	₹	\faViacoin		
₴	\faHryvnia	₹	\faRupeeSign	₩	\faWonSign		

Table 36: wasysym Currency Symbols

¢	\cent	¤	\currency	€	\wasyeuro*

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

Table 37: GiNA2e Currency Symbols

€	\Euro	₶	\Pound

Table 38: teubner Currency Symbols

⅄	\denarius	ↄ	\hemiobelion	ↄ	\tetartemorion
⊢	\dracma	⚡	\stater		

Table 39: tfrupee Currency Symbols

₹	\rupee

Table 40: eurosym Euro Signs

€	\geneuro	€	\geneuronarrow	€	\geneurowide	€	\officialeuro

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

Table 41: fourier Euro Signs

€	\eurologo	€	\texteuro

Table 42: textcomp Legal Symbols

Ⓟ	\textcircledP	©	©	\textcopyright		℠	\textservicemark
ↄ	\textcopyleft	®	®	\textregistered	™	™	\texttrademark

The first symbol column represents the—sometimes "faked"—symbol that LaTeX 2ε provides by default. The second symbol column represents the symbol as redefined by textcomp. The textcomp package is generally required to typeset Table 42's symbols in italic.

See http://www.texfaq.org/FAQ-tradesyms.html for solutions to common problems that occur when using these symbols (e.g., getting a "ⓡ" when you expected to get a "®").

Table 43: fontawesome5 Legal Symbols

	\faCopyright		\faCreativeCommonsRemix
	\faCopyright[regular]		\faCreativeCommonsSa
	\faCreativeCommons		\faCreativeCommonsSampling
	\faCreativeCommonsBy		\faCreativeCommonsSamplingPlus
	\faCreativeCommonsNc		\faCreativeCommonsShare
	\faCreativeCommonsNcEu		\faCreativeCommonsZero
	\faCreativeCommonsNcJp		\faRegistered
	\faCreativeCommonsNd		\faRegistered[regular]
	\faCreativeCommonsPd*	TM	\faTrademark
	\faCreativeCommonsPd		

Table 44: cclicenses Creative Commons License Icons

Ⓒ	\cc	Ⓝ	\ccnc*	Ⓢ	\ccsa*
Ⓑ	\ccby	Ⓓ	\ccnd		

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

Table 45: 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 46: 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 47: Miscellaneous textcomp Symbols

ƀ	\textblank	¶	\textpilcrow
¦	\textbrokenbar	'	\textquotesingle
‗	\textdblhyphen	‚	\textquotestraightbase
⸗	\textdblhyphenchar	„	\textquotestraightdblbase
⅋	\textdiscount	℞	\textrecipe
℮	\textestimated	※	\textreferencemark
⸘	\textinterrobang	—	\textthreequartersemdash
¡	\textinterrobangdown	~	\texttildelow
№	\textnumero	—	\texttwelveudash
○	\textopenbullet		

Table 48: Miscellaneous wasysym Text-mode Symbols

ſ	`\longs`	‰	`\permil`	§	`\wasyparagraph`*

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

Chapter 3

Mathematical symbols

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

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

Although there have been many requests on `comp.text.tex` for a contradiction symbol, the ensuing discussion invariably reveals innumerable ways to represent contradiction in a proof, including "$\lightning$" (`\blitza`), "$\Rightarrow\!\!\Leftarrow$" (`\Rightarrow\Leftarrow`), "$\bot$" (`\bot`), "$\nleftrightarrow$" (`\nleftrightarrow`), and "$\textreferencemark$" (`\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`), "$:=$" (*various*[1]), and "$\stackrel{\text{\tiny def}}{=}$" (`\stackrel{\text{\tiny def}}{=}`). See also the example of `\equalsfill` on page 374. Depending upon the context, disjoint union may be represented as "$\coprod$" (`\coprod`), "$\sqcup$" (`\sqcup`), "$\cupdot$" (`\dotcup`), "$\oplus$" (`\oplus`), "$\amalg$" (`\amalg`), 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 "$\varnothing x$" or "$\varnothing x$" (`\diameter x` or `\varnothing x`). The moral of the story is that you should be careful always to explain your notation to avoid confusing your readers.

Table 49: Math-mode Versions of Text Symbols

$	`\mathdollar`	¶	`\mathparagraph`	£	`\mathsterling`
...	`\mathellipsis`	§	`\mathsection`	_	`\mathunderscore`

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

[1] In txfonts, pxfonts, and mathtools the symbol is called `\coloneqq`. In mathabx and MnSymbol it's called `\coloneq`. In colonequals it's called `\colonequals`.

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

Table 50: logix Math-mode Versions of Text Symbols

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

logix requires either LuaLaTeX or XeLaTeX.

Table 51: logix Basic Operators

∗	\Asterick	⨦	\CircMinusPlus	÷	\Divd	−	\Minus
⊛	\CircAsterick	⊕	\CircPls	/	\Divide	∓	\MinusPlus
⊜	\CircDivd	⨢	\CircPlusMinus	∸	\DMinus	+	\Pls
⊘	\CircDivide	⊗	\CircTimes	∔	\DPlus	±	\PlusMinus
⊖	\CircMinus	⁎	\DAsterisk	×	\DTimes	×	\Times

logix requires either LuaLaTeX or XeLaTeX.

Table 52: cmll Unary Operators

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

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

Table 53: Binary Operators

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

* Not predefined by the LaTeX 2ε core. Use the latexsym package to expose this symbol.

Table 54: $\mathcal{AMS}$ 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" ↦ "$A^{\intercal}$". (See the May 2009 comp.text.tex thread, "raising math symbols", for suggestions about altering the height of the superscript.) \top (Table 223 on page 123), T, and \mathsf{T} are other popular choices: "$A^{\top}$", "A^{T}", "A^{T}".

Table 55: stmaryrd Binary Operators

ϕ	\baro	⫼	\interleave	⊛	\varoast
⫽	\bbslash	◅	\leftslice	⊍	\varobar
&	\binampersand	⩚	\merge	⊘	\varobslash
⋒	\bindnasrepma	⊖	\minuso	◎	\varocircle
⊠	\boxast	⫫	\moo	⊙	\varodot
⊞	\boxbar	⨣	\nplus	⊖	\varogreaterthan
⧈	\boxbox	⊍	\obar	⊖	\varolessthan
⧅	\boxbslash	□	\oblong	⊖	\varominus
⧇	\boxcircle	⊘	\obslash	⊕	\varoplus
⊡	\boxdot	⊖	\ogreaterthan	⊘	\varoslash
□	\boxempty	⊖	\olessthan	⊗	\varotimes
⧄	\boxslash	⩒	\ovee	⩒	\varovee
⋎	\curlyveedownarrow	⩑	\owedge	⩑	\varowedge
⋎	\curlyveeuparrow	▻	\rightslice	⨯	\vartimes
⋏	\curlywedgedownarrow	⫽	\sslash	⟙	\Ydown
⋏	\curlywedgeuparrow	⫿	\talloblong	≺	\Yleft
⧹	\fatbslash	◯	\varbigcirc	≻	\Yright
⨟	\fatsemi	⋎	\varcurlyvee	⟙	\Yup
⫻	\fatslash	⋏	\varcurlywedge		

Table 56: wasysym Binary Operators

◁	\lhd	○	\ocircle	▶	\RHD	⊵	\unrhd
◀	\LHD	▷	\rhd	⊴	\unlhd		

Table 57: txfonts/pxfonts Binary Operators

⦶	\circledbar	⦵	\circledwedge	○	\medcirc
⦸	\circledbslash	⅋	\invamp	⨣	\sqcapplus
⦷	\circledvee	●	\medbullet	⨤	\sqcupplus

Table 58: mathabx Binary Operators

∗	\ast	⋏	\curlywedge	⊓	\sqcap
✻	\Asterisk	⨪	\divdot	⊔	\sqcup
⩛	\barwedge	⋇	\divideontimes	⩏	\sqdoublecap
★	\bigstar	∸	\dotdiv	⩐	\sqdoublecup
✶	\bigvarstar	∔	\dotplus	▫	\square
◆	\blackdiamond	⋇	\dottimes	⨥	\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 59: MnSymbol Binary Operators

⨿	\amalg	⩏	\doublesqcup	∴	\righttherefore
∗	\ast	⩊	\doublevee	≺	\rightthreetimes
⨸	\backslashdiv	⩓	\doublewedge	≻	\rightY
⋈	\bowtie	∵	\downtherefore	⋊	\rtimes
•	\bullet	≻	\downY	⨸	\slashdiv
∩	\cap	⨷	\dtimes	∏	\smallprod
⩍	\capdot	⁘	\fivedots	⊓	\sqcap
⨣	\capplus	∞	\hbipropto	⩍	\sqcapdot
·	\cdot	¨	\hdotdot	⨣	\sqcapplus
∘	\circ	⌐	\lefthalfcap	⊔	\sqcup

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⋎	\closedcurlyvee	⌞	\lefthalfcup	⊔	\sqcupdot
⋏	\closedcurlywedge	∵	\leftthere fore	⊎	\sqcupplus
∪	\cup	⋋	\leftthreetimes	∷	\squaredots
⊍	\cupdot	≺	\leftY	×	\times
⊎	\cupplus	⋉	\ltimes	⋰	\udotdot
⋎	\curlyvee	⧹	\medbackslash	∴	\uptherefore
⋟	\curlyveedot	○	\medcircle	⅄	\upY
⋏	\curlywedge	⟋	\medslash	⨰	\utimes
⋔	\curlywedgedot	∣	\medvert	⨾	\vbipropto
⋱	\ddotdot	∣·	\medvertdot	:	\vdotdot
∴	\diamonddots	−	\minus	∨	\vee
÷	\div	∸	\minusdot	⩒	\veedot
·∣	\dotmedvert	∓	\mp	⧖	\vertbowtie
∸	\dotminus	⍀	\neswbipropto	·∣·	\vertdiv
⋒	\doublecap	⍁	\nwsebipropto	∧	\wedge
⋓	\doublecup	+	\plus	⩓	\wedgedot
⋦	\doublecurlyvee	±	\pm	≀	\wreath
⩛	\doublecurlywedge	⌝	\righthalfcap		
⋓	\doublesqcap	⌟	\righthalfcup		

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

Table 60: fdsymbol Binary Operators

⨿	\amalg	⩏	\doublesqcup	≻	\rightY
∗	\ast	⩔	\doublevee	⋊	\rtimes
⊼	\barwedge	⩛	\doublewedge	∖	\setminus
⋈	\bowtie	⅄	\downY	⊓	\sqcap
∩	\cap	⧢	\dtimes	⊡	\sqcapdot
⩀	\capdot	‥	\hdotdot	⊞	\sqcapplus
⩂	\capplus	⊺	\intercal	⊔	\sqcup
·	\cdot	⨍	\intprod	⊍	\sqcupdot
▪	\centerdot	⨎	\intprodr	⊎	\sqcupplus
∪	\cup	⋋	\leftthreetimes	×	\times
⊍	\cupdot	≺	\leftY	⨲	\timesbar

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⊎	\cupplus	⋉	\ltimes	⋰	\udotdot
⋎	\curlyvee	⧹	\medbackslash	⧖	\upbowtie
⋏	\curlywedge	⟋	\medslash	⅄	\upY
⋱	\ddotdot	−	\minus	⨻	\utimes
÷	\div	∸	\minusdot	⨿	\varamalg
⋇	\divideontimes	∹	\minusfdots	⁚	\vdotdot
⁄	\divslash	⨪	\minusrdots	⋮	\vdots
∸	\dotminus	∓	\mp	∨	\vee
∔	\dotplus	+	\plus	⩒	\veebar
⁙	\dottimes	∔	\plusdot	⟇	\veedot
⩛	\doublebarwedge	±	\pm	⩚	\veedoublebar
⋒	\doublecap	⌟	\pullback	∧	\wedge
⋓	\doublecup	⌜	\pushout	⟑	\wedgedot
⩋	\doublesqcap	⋌	\rightthreetimes	≀	\wreath

fdsymbol defines \btimes as a synonym for \dtimes; \Cap as a synonym for \doublecap; \Cup as a synonym for \doublecup; \hookupminus as a synonym for \intprodr; \hourglass as a synonym for \upbowtie; \land as a synonym for \wedge; \lor as a synonym for \vee; \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 61: boisik Binary Operators

∗	\ast	⁙	\dottimes	⧓	\rtimesblack
⍿	\baro	⩛	\doublebarwedge	⧵	\smallsetminus
⟑	\barwedge	⁏	\fatsemi	⨵	\smashtimes
⫻	\bbslash	⩾	\gtrdot	⨥	\squplus
&	\binampersand	⊺	\intercal	⫽	\sslash
⅋	\bindnasrepma	⟅	\lbag	×	\times
⧓	\blackbowtie	⧑	\lblackbowtie	⊎	\uplus
⋈	\bowtie	◁	\leftslice	∩	\varcap
∩	\cap	⋋	\leftthreetimes	∪	\varcup
⋒	\Cap	⩽	\lessdot	⊺	\varintercal

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·	\cdot	⋉	\ltimes	⊓	\varsqcap
⋅	\centerdot	⋉	\ltimesblack	⊔	\varsqcup
⊹	\circplus	⋔	\merge	⋇	\vartimes
∗	\coAsterisk	⊖	\minuso	∨	\vee
⋇	\convolution	⊥	\moo	⋁	\Vee
∪	\cup	∓	\mp	⊻	\veebar
⋓	\Cup	⊕	\nplus	⋁	\veeonvee
⊎	\cupleftarrow	⊕	\pluscirc	∧	\wedge
⋎	\curlyvee	⊹	\plustrif	⋀	\Wedge
⋏	\curlywedge	±	\pm	⋎	\Ydown
†	\dagger	∫	\rbag	≺	\Yleft
‡	\ddagger	⋈	\rblackbowtie	≻	\Yright
÷	\div	⊳	\rightslice	⋏	\Yup
⋇	\divideontimes	⋌	\rightthreetimes		
⊹	\dotplus	⋊	\rtimes		

Table 62: stix Binary Operators

⊔	\amalg	⨾	\fcmp	⊔	\sqcup
∗	\ast	⁄	\fracslash	⊔	\Sqcup
⊓	\barcap	⊤	\intercal	⫽	\sslash
⊔	\barcup	⫼	\interleave	⋮	\threedotcolon
⊽	\barvee	⊔	\intprod	×	\times
⊼	\barwedge	⊔	\intprodr	⨯	\timesbar
⋁	\bigslopedvee	∾	\invlazys	−	\tminus
⋀	\bigslopedwedge	⋋	\leftthreetimes	+	\tplus
⨯	\btimes	⊲	\lhd	⧺	\tripleplus
∩	\cap	⋉	\ltimes	⫻	\trslash
⋒	\Cap	⊻	\midbarvee	⋒	\twocaps
⋓	\capbarcup	⊼	\midbarwedge	⋓	\twocups
⋒	\capdot	∸	\minusdot	⦂	\typecolon
⋓	\capovercup	∸	\minusfdots	⊎	\uminus
⋒	\capwedge	∸	\minusrdots	⊴	\unlhd
⊓	\closedvarcap	∓	\mp	⊵	\unrhd
⊔	\closedvarcup	⧻	\nhVvert	⋖	\upand
⊠	\closedvarcupsmashprod	⊕	\opluslhrim	⊎	\uplus
∸	\commaminus	⊕	\oplusrhrim	⊼	\varbarwedge

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∪	\cup	⊗	\otimeslhrim	⩘	\vardoublebarwedge
⋓	\Cup	⊗	\otimesrhrim	⩒	\varveebar
⩊	\cupbarcap	∔	\plusdot	×	\vectimes
⊍	\cupdot	⩲	\pluseqq	⩛	\Vee
⊌	\cupleftarrow	⨣	\plushat	∨	\vee
⩌	\cupovercap	⨦	\plussim	⩒	\veebar
⩏	\cupvee	⨧	\plussubtwo	⩚	\veedot
⋎	\curlyvee	⨢	\plustrif	⩖	\veedoublebar
⋏	\curlywedge	±	\pm	⩛	\veemidvert
†	\dagger	⊳	\rhd	⟇	\veeodot
‡	\ddagger	⋌	\rightthreetimes	⩛	\veeonvee
÷	\div	⨥	\ringplus	⩓	\Wedge
⋇	\divideontimes	⨸	\rsolbar	∧	\wedge
∸	\dotminus	⋊	\rtimes	⩟	\wedgebar
∔	\dotplus	\	\setminus	⩠	\wedgedot
⇱	\dottimes	⧢	\shuffle	⩡	\wedgedoublebar
⩗	\doublebarvee	⨤	\simplus	⩛	\wedgemidvert
⩘	\doublebarwedge	⧹	\smallsetminus	⟑	\wedgeodot
⧺	\doubleplus	⨳	\smashtimes	⩓	\wedgeonwedge
⧸	\dsol	⊓	\sqcap	≀	\wr
⩱	\eqqplus	⩎	\Sqcap		

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

Table 63: mathdesign Binary Operators

⨴	\dtimes	⨵	\udtimes	⨶	\utimes

The mathdesign package additionally provides versions of each of the binary operators shown in Table 54.

Table 64: pdfMsym Binary Operators

⩀	\circwedge	⨪	\divs	⨫	\ndivs
⩅	\dcup	⩀	\dwedge		

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

Table 65: cmll Binary Operators

⅋	\parr*	&	\with†

* cmll defines \invamp as a synonym for \parr.

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

Table 66: shuffle Binary Operators

⧢	\cshuffle	⧢	\shuffle

Table 67: resmes Binary Operators

⌙	\resmes

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

Table 68: logix Logical Operators

⊔	\CircInvNt	⍓	\CircXor	⊼	\Nand	⩚	\SbNd
⍓	\CircNand	↛	\Dnd	∧	\Nd	⩛	\SbNor
⍲	\CircNd	↚	\Dnt	∼	\Ngt	⩒	\SbOr
⍱	\CircNgt	⇸	\Dor	⊽	\Nor	⩡	\SbXor
⍱	\CircNor	⌴	\InvNt	¬	\Nt	|	\Shfr
⍲	\CircNt	↑	\Lnand	∨	\Or	⩡	\Xor
⍲	\CircOr	↓	\Lnor	⩚	\SbNand		

logix requires either LuaLaTeX or XeLaTeX.

Table 69: ulsy Geometric Binary Operators

⊜	\odplus

Table 70: mathabx Geometric Binary Operators

▾	\blacktriangledown	⊞	\boxright	⊖	\ominus
◂	\blacktriangleleft	⧄	\boxslash	⊕	\oplus
▸	\blacktriangleright	⊠	\boxtimes	⊕	\oright
▴	\blacktriangleup	⊤	\boxtop	⊘	\oslash
⊛	\boxasterisk	⧋	\boxtriangleup	⊗	\otimes
⧅	\boxbackslash	□	\boxvoid	⊕	\otop
⊥	\boxbot	⊛	\oasterisk	⧋	\otriangleup
⊡	\boxcirc	⦸	\obackslash	○	\ovoid
⊛	\boxcoasterisk	⊖	\obot	▿	\smalltriangledown
⊡	\boxdiv	⊙	\ocirc	◃	\smalltriangleleft
⊡	\boxdot	⊛	\ocoasterisk	▹	\smalltriangleright
⊟	\boxleft	⊘	\odiv	▵	\smalltriangleup
⊟	\boxminus	⊙	\odot		
⊞	\boxplus	⊕	\oleft		

Table 71: 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 72: 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
●	\medblackcircle	⊖	\odash	◃	\smalltriangleleft
◆	\medblackdiamond	⊙	\odot	▹	\smalltriangleright
■	\medblacksquare	⊜	\oequal	▵	\smalltriangleup
★	\medblackstar	⊖	\ominus	☆	\smallwhitestar

fdsymbol defines synonyms for most of the preceding symbols:

◆	\blackdiamond	⋄	\diamond	•	\smblkcircle
▲	\blacktriangle	◇	\Diamond	◆	\smblkdiamond
▼	\blacktriangledown	⟐	\diamondbslash	▪	\smblksquare
◀	\blacktriangleleft	⟐	\diamondcdot	☆	\smwhitestar
▶	\blacktriangleright	◆	\mdblkdiamond	∘	\smwhtcircle
□	\Box	■	\mdblksquare	⋄	\smwhtdiamond
◫	\boxbar	●	\mdlgblkcircle	▫	\smwhtsquare
⧅	\boxbslash	◆	\mdlgblkdiamond	□	\square
⧄	\boxdiag	■	\mdlgblksquare	⋆	\star
•	\bullet	○	\mdlgwhtcircle	△	\triangle
∘	\circ	◇	\mdlgwhtdiamond	▽	\triangledown
⊛	\circledast	□	\mdlgwhtsquare	◁	\triangleleft
◎	\circledcirc	◇	\mdwhtdiamond	▷	\triangleright
⊖	\circleddash	□	\mdwhtsquare	△	\vartriangle
⊜	\circledequal	★	\medstar		
⦶	\circledvert	⦸	\obslash		

Table 73: 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 74: stix Geometric Binary Operators

⧗	\blackhourglass	⟡	\concavediamondtickleft	⊕	\oplus
⊠	\boxast	⟡	\concavediamondtickright	⊘	\oslash
◫	\boxbar	⋄	\diamond	⊗	\otimes
⧈	\boxbox	◁	\dsub	⨷	\Otimes
⧅	\boxbslash	⧖	\hourglass	⊗̂	\otimeshat
⊡	\boxcircle	⟠	\lozengeminus	▷	\rsub
⧄	\boxdiag	⧫	\mdlgblklozenge	•	\smblkcircle
⊡	\boxdot	○	\mdlgwhtcircle	⋆	\star
⊟	\boxminus	⊕	\obar	▯	\talloblong
⊞	\boxplus	⊖	\obot*	△	\triangle
⊠	\boxtimes	⊘	\obslash	⟁	\triangleminus
⊛	\circledast	⊜	\odiv	⟁	\triangleplus
⊚	\circledcirc	⊙	\odot	△	\triangleserifs
⊖	\circleddash	⊘	\odotslashdot*	⟁	\triangletimes
⊜	\circledequal	⊜	\ogreaterthan	•	\vysmblkcircle†

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⦶	\circledparallel	⊗	\olcross*	∘	\vysmwhtcircle
⦵	\circledvert	⦾	\olessthan	⊣□	\whitesquaretickleft
⊖	\circlehbar	⊖	\ominus	□⊢	\whitesquaretickright
✧	\concavediamond	⦱	\operp		

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

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

Table 75: logix Geometric Binary Operators

●	\BlackCircle	◁	\LogPast
⬩	\BlackCircleA	◈	\LogPos
•	\BlackCircleB	○	\LWhiteCircle
•	\BlackCircleC	✧	\LWhiteCurvedDiamond
●	\BlackCircleD	◇	\LWhiteDiamond
●	\BlackCircleE	▽	\LWhiteDownTriangle
●	\BlackCircleF	◁	\LWhiteLeftArrowHead
●	\BlackCircleG	◁	\LWhiteLeftTriangle
●	\BlackCircleH	⌑	\LWhiteLozenge
●	\BlackCircleI	▷	\LWhiteRightArrowHead
✦	\BlackCurvedDiamond	▷	\LWhiteRightCurvedArrowHead
◆	\BlackDiamond	▷	\LWhiteRightTriangle
⬩	\BlackDiamondA	○	\LWhiteSmallCircle
◆	\BlackDiamondB	□	\LWhiteSquare
◆	\BlackDiamondC	▢	\LWhiteSquareRoundCorners
◆	\BlackDiamondD	△	\LWhiteUpTriangle
◆	\BlackDiamondE	∘	\LWhiteVerySmallCircle
◆	\BlackDiamondF	▫	\LWhiteVerySmallSquare
◆	\BlackDiamondG	■	\Nec
◆	\BlackDiamondH	●	\Next
◆	\BlackDiamondI	▲	\NonCont
▼	\BlackDownTriangle	◎	\OutlineCircle
▾	\BlackDownTriangleA	✧	\OutlineCurvedDiamond
▾	\BlackDownTriangleB	◇	\OutlineDiamond
▼	\BlackDownTriangleC	▽	\OutlineDownTriangle
▼	\BlackDownTriangleD	◁	\OutlineLeftArrowHead

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▼ \BlackDownTriangleE
▼ \BlackDownTriangleF
▼ \BlackDownTriangleG
▼ \BlackDownTriangleH
▼ \BlackDownTriangleI
◀ \BlackLeftArrowHead
◀ \BlackLeftTriangle
◂ \BlackLeftTriangleA
◂ \BlackLeftTriangleB
◂ \BlackLeftTriangleC
◀ \BlackLeftTriangleD
◀ \BlackLeftTriangleE
◀ \BlackLeftTriangleF
◀ \BlackLeftTriangleG
◀ \BlackLeftTriangleH
◀ \BlackLeftTriangleI
▪ \BlackLozenge
• \BlackReallySmallCircle
◆ \BlackReallySmallDiamond
▪ \BlackReallySmallSquare
▶ \BlackRightArrowHead
◗ \BlackRightCurvedArrowHead
▶ \BlackRightTriangle
▸ \BlackRightTriangleA
▸ \BlackRightTriangleB
▸ \BlackRightTriangleC
▶ \BlackRightTriangleD
▶ \BlackRightTriangleE
▶ \BlackRightTriangleF
▶ \BlackRightTriangleG
▶ \BlackRightTriangleH
▶ \BlackRightTriangleI
● \BlackSmallCircle
■ \BlackSquare
▪ \BlackSquareA
▪ \BlackSquareB
■ \BlackSquareC
■ \BlackSquareD
■ \BlackSquareE
■ \BlackSquareF
■ \BlackSquareG
■ \BlackSquareH
■ \BlackSquareI
● \BlackSquareRoundCorners

◁ \OutlineLeftTriangle
▫ \OutlineLozenge
▷ \OutlineRightArrowHead
▷ \OutlineRightCurvedArrowHead
▷ \OutlineRightTriangle
○ \OutlineSmallCircle
□ \OutlineSquare
▢ \OutlineSquareRoundCorners
△ \OutlineUpTriangle
◦ \OutlineVerySmallCircle
▫ \OutlineVerySmallSquare
◀ \Past
◆ \Pos
▪ \QuartedLozenge
⊕ \QuarteredCircle
⟡ \QuarteredCurvedDiamond
⟠ \QuarteredDiamond
▽ \QuarteredDownTriangle
◁ \QuarteredLeftTriangle
▷ \QuarteredRightTriangle
⊕ \QuarteredSmallCircle
⊞ \QuarteredSquare
⊕ \QuarteredSquareRoundCorners
△ \QuarteredUpTriangle
⊕ \QuarteredVerySmallCircle
⊞ \QuarteredVerySmallSquare
▽ \TmpCont
▷ \TmpFutr
⊟ \TmpNec
⊖ \TmpNext
△ \TmpNonCont
◁ \TmpPast
⟠ \TmpPos
⊘ \UpSlahsedSquareRoundCorners
⊘ \UpSlashedCircle
⟡ \UpSlashedCurvedDiamond
◇ \UpSlashedDiamond
▽ \UpSlashedDownTriangle
◁ \UpSlashedLeftTriangle
▫ \UpSlashedLozenge
▷ \UpSlashedRightTriangle
⊘ \UpSlashedSmallCircle
◪ \UpSlashedSquare
△ \UpSlashedUpTriangle

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

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⊡ \DottedSquare
⊙ \DottedSquareRoundCorners
◬ \DottedUpTriangle
⊙ \DottedVerySmallCircle
▫ \DottedVerySmallSquare
⊘ \DownSlashedCircle
⟡ \DownSlashedCurvedDiamond
◈ \DownSlashedDiamond
▽ \DownSlashedDownTriangle
◁ \DownSlashedLeftTriangle
⧅ \DownSlashedLozenge
▷ \DownSlashedRightTriangle
⊘ \DownSlashedSmallCircle
⧅ \DownSlashedSquare
⊘ \DownSlashedSquareRoundCorners
◬ \DownSlashedUpTriangle
⊘ \DownSlashedVerySmallCircle
▫ \DownSlashedVerySmallSquare
▽ \DoxCont
▷ \DoxFutr
▣ \DoxNec
⦿ \DoxNext
◬ \DoxNonCont
◁ \DoxPast
◈ \DoxPos
▽ \FacCont
▷ \FacFutr
□ \FacNec
○ \FacNext
△ \FacNonCont
◁ \FacPast
◇ \FacPos
▶ \Futr
⊖ \HorizontallyDividedCircle
⟡ \HorizontallyDividedCurvedDiamond
◈ \HorizontallyDividedDiamond
▽ \HorizontallyDividedDownTriangle
◁ \HorizontallyDividedLeftTriangle
⧈ \HorizontallyDividedLozenge
▷ \HorizontallyDividedRightTriangle
⊖ \HorizontallyDividedSmallCircle
⊟ \HorizontallyDividedSquare
⊖ \HorizontallyDividedSquareRoundCorners
◬ \HorizontallyDividedUpTriangle
▽ \WhiteDownTriangleD
▽ \WhiteDownTriangleE
▽ \WhiteDownTriangleF
▽ \WhiteDownTriangleG
▽ \WhiteDownTriangleH
▽ \WhiteDownTriangleI
◁ \WhiteLeftArrowHead
◁ \WhiteLeftTriangle
◂ \WhiteLeftTriangleA
◂ \WhiteLeftTriangleB
◂ \WhiteLeftTriangleC
◁ \WhiteLeftTriangleContainingBlackLeftTriangle
◁ \WhiteLeftTriangleD
◁ \WhiteLeftTriangleE
◁ \WhiteLeftTriangleF
◁ \WhiteLeftTriangleG
◁ \WhiteLeftTriangleH
◁ \WhiteLeftTriangleI
⧈ \WhiteLozenge
⧈ \WhiteLozengeContainingBlackLozenge
◦ \WhiteReallySmallCircle
◇ \WhiteReallySmallDiamond
▫ \WhiteReallySmallSquare
▷ \WhiteRightArrowHead
▷ \WhiteRightCurvedArrowHead
▷ \WhiteRightTriangle
▸ \WhiteRightTriangleA
▸ \WhiteRightTriangleB
▸ \WhiteRightTriangleC
▷ \WhiteRightTriangleContainingBlackRightTriangle
▷ \WhiteRightTriangleD
▷ \WhiteRightTriangleE
▷ \WhiteRightTriangleF
▷ \WhiteRightTriangleG
▷ \WhiteRightTriangleH
▷ \WhiteRightTriangleI
○ \WhiteSmallCircle
⊙ \WhiteSmallCircleContainingBlackCircle
□ \WhiteSquare
▫ \WhiteSquareA
▫ \WhiteSquareB
□ \WhiteSquareC
▣ \WhiteSquareContainingBlackSquare
□ \WhiteSquareD

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⊖	\HorizontallyDividedVerySmallCircle	□	\WhiteSquareE
▫	\HorizontallyDividedVerySmallSquare	□	\WhiteSquareF
●	\LBlackCircle	□	\WhiteSquareG
✦	\LBlackCurvedDiamond	□	\WhiteSquareH
◆	\LBlackDiamond	□	\WhiteSquareI
▼	\LBlackDownTriangle	▢	\WhiteSquareRoundCorners
◀	\LBlackLeftArrowHead	▣	\WhiteSquareRoundCornersContainingBlackSquare
◀	\LBlackLeftTriangle	△	\WhiteUpTriangle
▪	\LBlackLozenge	▵	\WhiteUpTriangleA
▶	\LBlackRightArrowHead	▵	\WhiteUpTriangleB
▶	\LBlackRightCurvedArrowHead	▵	\WhiteUpTriangleC
▶	\LBlackRightTriangle	◬	\WhiteUpTriangleContainingBlackUpTriangle
●	\LBlackSmallCircle	△	\WhiteUpTriangleD
■	\LBlackSquare	△	\WhiteUpTriangleE
■	\LBlackSquareRoundCorners	△	\WhiteUpTriangleF
▲	\LBlackUpTriangle	△	\WhiteUpTriangleG
•	\LBlackVerySmallCircle	△	\WhiteUpTriangleH
▪	\LBlackVerySmallSquare	△	\WhiteUpTriangleI
▽	\LogCont	◦	\WhiteVerySmallCircle
▷	\LogFutr	⊙	\WhiteVerySmallCircleContainingBlackCircle
⊡	\LogNec	▫	\WhiteVerySmallSquare
⊙	\LogNext	▣	\WhiteVerySmallSquareContainingBlackSquare
◬	\LogNonCont		

logix requires either LuaLaTeX or XeLaTeX.

Table 76: halloweenmath Halloween-Themed Math Operators

🎃	\bigpumpkin‡		\mathleftghost		\reversemathcloud
💀	\bigskull		\mathrightbat		\reversemathwitch†
	\mathbat		\mathrightghost		\reversemathwitch*†
	\mathcloud		\mathwitch*†	💀	\skull
	\mathghost		\mathwitch†		
	\mathleftbat	🎃	\pumpkin		

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

$$\mathwitch*_{i=0}^{\infty} f(x)$$

in display mode.

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

Table 77: stix Small Integrals

⨏	\smallawint	⨙	\smallintcap	∲	\smalloint
⨐	\smallcirfnint	⨍	\smallintclockwise	⨑	\smallointctrclockwise
⨎	\smallfint	⨚	\smallintcup	⨔	\smallpointint
⨌	\smalliiiint	⨏	\smallintlarhk	⨒	\smallrppolint
∭	\smalliiint	⨘	\smallintx	⨓	\smallscpolint
∬	\smalliint	⨜	\smalllowint	⨖	\smallsqint
∫	\smallint	⨒	\smallnpolint	⨕	\smallsumint
⨍	\smallintbar	⨋	\smalloiiint	⨗	\smallupint
⨎	\smallintBar	⨊	\smalloiint	∳	\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 78.

Table 78: stix Small Integrals with Explicit Slant

⨏	\smallawintsl	⨏	\smallawintup
⨐	\smallcirfnintsl	⨐	\smallcirfnintup
⨎	\smallfintsl	⨎	\smallfintup
⨌	\smalliiiintsl	⨌	\smalliiiintup
∭	\smalliiintsl	∭	\smalliiintup
∬	\smalliintsl	∬	\smalliintup
⨍	\smallintbarsl	⨎	\smallintBarup
⨎	\smallintBarsl	⨍	\smallintbarup
⨙	\smallintcapsl	⨙	\smallintcapup
⨍	\smallintclockwisesl	⨍	\smallintclockwiseup
⨚	\smallintcupsl	⨚	\smallintcupup
⨏	\smallintlarhksl	⨏	\smallintlarhkup
∫	\smallintsl	∫	\smallintup
⨘	\smallintxsl	⨘	\smallintxup
⨜	\smalllowintsl	⨜	\smalllowintup
⨒	\smallnpolintsl	⨒	\smallnpolintup
⨋	\smalloiiintsl	⨋	\smalloiiintup
⨊	\smalloiintsl	⨊	\smalloiintup
∲	\smallointctrclockwisesl	∲	\smallointctrclockwiseup
∮	\smallointsl	∮	\smallointup
⨔	\smallpointintsl	⨔	\smallpointintup
⨒	\smallrppolintsl	⨒	\smallrppolintup
⨓	\smallscpolintsl	⨓	\smallscpolintup

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$\smallsqint$	`\smallsqintsl`	$\smallsqint$	`\smallsqintup`
$\smallsumint$	`\smallsumintsl`	$\smallsumint$	`\smallsumintup`
$\smallupint$	`\smallupintsl`	$\smallupint$	`\smallupintup`
$\smallvarointclockwise$	`\smallvarointclockwisesl`	$\smallvarointclockwise$	`\smallvarointclockwiseup`

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

Table 79: Variable-sized Math Operators

$\bigcap$	`\bigcap`	$\bigotimes$	`\bigotimes`	$\bigwedge$	`\bigwedge`	$\prod$	`\prod`
$\bigcup$	`\bigcup`	$\bigsqcup$	`\bigsqcup`	$\coprod$	`\coprod`	$\sum$	`\sum`
$\bigodot$	`\bigodot`	$\biguplus$	`\biguplus`	$\int$	`\int`		
$\bigoplus$	`\bigoplus`	$\bigvee$	`\bigvee`	$\oint$	`\oint`		

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

$\iint$	`\iint`	$\iiint$	`\iiint`
$\iiiint$	`\iiiint`	$\int\cdots\int$	`\idotsint`

Table 81: stmaryrd Variable-sized Math Operators

$\bigboxplus$	`\bigbox`	$\biginterleave$	`\biginterleave`	$\bigsqcap$	`\bigsqcap`
$\bigcurlyvee$	`\bigcurlyvee`	$\bignplus$	`\bignplus`	$\bigtriangledown$	`\bigtriangledown`
$\bigcurlywedge$	`\bigcurlywedge`	$\bigparallel$	`\bigparallel`	$\bigtriangleup$	`\bigtriangleup`

Table 82: wasysym Variable-sized Math Operators

$\int\int$	`\int`	$\iint\iint$	`\iint`	$\iiint\iiint$	`\iiint`
$\oint\oint$	`\oint`	$\oiint\oiint$	`\oiint`		

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

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

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

Table 83: mathabx Variable-sized Math Operators

$\curlyvee\curlyvee$	`\bigcurlyvee`	$\boxslash\boxslash$	`\bigboxslash`	$\oplus\oplus$	`\bigoright`
$\sqcap\sqcap$	`\bigsqcap`	$\boxtimes\boxtimes$	`\bigboxtimes`	$\oslash\oslash$	`\bigoslash`
$\curlywedge\curlywedge$	`\bigcurlywedge`	$\boxplus\boxplus$	`\bigboxtop`	$\otimes\otimes$	`\bigotop`
$\boxast\boxast$	`\bigboxasterisk`	$\boxminus\boxminus$	`\bigboxtriangleup`	$\ominus\ominus$	`\bigotriangleup`
$\boxbslash\boxbslash$	`\bigboxbackslash`	$\boxdot\boxdot$	`\bigboxvoid`	$\odot\odot$	`\bigovoid`
$\boxbot\boxbot$	`\bigboxbot`	$\complement\complement$	`\bigcomplementop`	$+\!\!+$	`\bigplus`
$\boxcirc\boxcirc$	`\bigboxcirc`	$\circledast\circledast$	`\bigoasterisk`	$\boxplus\boxplus$	`\bigsquplus`
$\boxast\boxast$	`\bigboxcoasterisk`	$\circledcirc\circledcirc$	`\bigobackslash`	$\times\times$	`\bigtimes`

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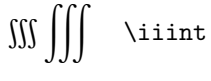
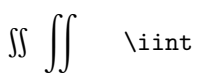
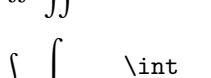
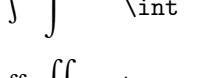
	`\bigboxdiv`		`\bigobot`		`\iiint`
	`\bigboxdot`		`\bigocirc`		`\iint`
	`\bigboxleft`		`\bigocoasterisk`		`\int`
	`\bigboxminus`		`\bigodiv`		`\oiint`
	`\bigboxplus`		`\bigoleft`		`\oint`
	`\bigboxright`		`\bigominus`		

Table 84: txfonts/pxfonts Variable-sized Math Operators

	`\bigsqcapplus`		`\ointclockwise`		
	`\bigsqcupplus`		`\ointctrclockwise`		
	`\fint`		`\sqiiint`		
	`\idotsint`		`\sqiint`		
	`\iiiint`		`\sqint`		
	`\iiint`		`\varoiiintclockwise`		

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∬	∬	\iint	⨌	⨌	\varoiiintctrclockwise
⨋	⨋	\oiiintclockwise	⨍	⨍	\varoiintclockwise
⨌	⨌	\oiiintctrclockwise	⨍	⨍	\varoiintctrclockwise
⨌	⨌	\oiiint	∮	∮	\varointclockwise
⨏	⨏	\oiintclockwise	∮	∮	\varointctrclockwise
⨏	⨏	\oiintctrclockwise	×	×	\varprod
⨏	⨏	\oiint			

Table 85: esint Variable-sized Math Operators

∫⋯∫	∫⋯∫	\dotsint	∮	∮	\ointclockwise
⨍	⨍	\fint	∮	∮	\ointctrclockwise
∬∬	∬∬	\iiiint	⨋	⨋	\sqiint
∭	∭	\iiint	⨏	⨏	\sqint
∬	∬	\iint	⨌	⨌	\varoiint
⨎	⨎	\landdownint	∮	∮	\varointclockwise
⨏	⨏	\landupint	∮	∮	\varointctrclockwise
⨌	⨌	\oiint			

Table 86: bigints Variable-sized Math Operators

$\int$	$\int$	\bigint	$\oint$	$\oint$	\bigoint
$\int$	$\int$	\bigints	$\oint$	$\oint$	\bigoints
$\int$	$\int$	\bigintss	$\oint$	$\oint$	\bigointss
$\int$	$\int$	\bigintsss	$\oint$	$\oint$	\bigointsss
$\int$	$\int$	\bigintssss	$\oint$	$\oint$	\bigointssss

Table 87: MnSymbol Variable-sized Math Operators

$\cap$	$\bigcap$	\bigcap	$\ominus$	$\bigominus$	\bigominus	$\complement$	$\complement$	\complement
$\cap\!\!\cdot$	$\bigcap\!\!\cdot$	\bigcapdot	$\oplus$	$\bigoplus$	\bigoplus	$\amalg$	$\coprod$	\coprod
$\cap\!\!+$	$\bigcap\!\!+$	\bigcapplus	$\oslash$	$\bigoslash$	\bigoslash	$\int\!\cdots\!\int$	$\int\!\cdots\!\int$	\idotsint
$\circ$	$\bigcirc$	\bigcircle	$\circledast$	$\bigcirc\!\!\!\!\ast$	\bigostar	$\iiiint$	$\iiiint$	\iiiint
$\cup$	$\bigcup$	\bigcup	$\otimes$	$\bigotimes$	\bigotimes	$\iiint$	$\iiint$	\iiint
$\cup\!\!\cdot$	$\bigcup\!\!\cdot$	\bigcupdot	$\circledcirc$	$\bigcirc\!\!\!\!\circ$	\bigotriangle	$\iint$	$\iint$	\iint
$\uplus$	$\bigcup\!\!+$	\bigcupplus*	$\circledcirc$	$\bigcirc\!\!\!\!\circ$	\bigovert	$\int$	$\int$	\int
$\curlyvee$	$\bigcurlyvee$	\bigcurlyvee	$+$	$\bigplus$	\bigplus	$\fint$	$\fint$	\landdownint
$\curlyvee\!\!\cdot$	$\bigcurlyvee\!\!\cdot$	\bigcurlyveedot	$\sqcap$	$\bigsqcap$	\bigsqcap	$\fint$	$\fint$	\landupint
$\curlywedge$	$\bigcurlywedge$	\bigcurlywedge	$\sqcap\!\!\cdot$	$\bigsqcap\!\!\cdot$	\bigsqcapdot	$\oint$	$\oint$	\lcircleleftint
$\curlywedge\!\!\cdot$	$\bigcurlywedge\!\!\cdot$	\bigcurlywedgedot	$\sqcap\!\!+$	$\bigsqcap\!\!+$	\bigsqcapplus	$\oint$	$\oint$	\lcirclerightint

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$\Yvee$	$\Yvee$	\bigdoublecurlyvee	$\sqcup$	$\sqcup$	\bigsqcup	$\oiint$	$\oiint$	\oiint
$\Curlyvee$	$\Curlyvee$	\bigdoublecurlywedge	$\dot\sqcup$	$\dot\sqcup$	\bigsqcupdot	$\oint$	$\oint$	\oint
$\Vvee$	$\Vvee$	\bigdoublevee	$\sqcup\!\!+$	$\sqcup\!\!+$	\bigsqcupplus	$\prod$	$\prod$	\prod
$\Curlywedge$	$\Curlywedge$	\bigdoublewedge	$\times$	$\times$	\bigtimes	$\oint$	$\oint$	\rcircleleftint
$\circledast$	$\circledast$	\bigoast	$\vee$	$\vee$	\bigvee	$\oint$	$\oint$	\rcirclerightint
$\circledcirc$	$\circledcirc$	\bigobackslash	$\dot\vee$	$\dot\vee$	\bigveedot	$\int\!\!\!\!-$	$\int\!\!\!\!-$	\strokedint
$\circledcirc$	$\circledcirc$	\bigocirc	$\wedge$	$\wedge$	\bigwedge	$\sum$	$\sum$	\sum
$\odot$	$\odot$	\bigodot	$\dot\wedge$	$\dot\wedge$	\bigwedgedot	$\int\!\!\!\!\!\!-$	$\int\!\!\!\!\!\!-$	\sumint

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

Table 88: fdsymbol Variable-sized Math Operators

$\cap$	$\cap$	\bigcap	$\sqcup$	$\sqcup$	\bigsqcup	$\int\!\!\!\!\sim$	$\int\!\!\!\!\sim$	\landupint
$\cap\!\!\cdot$	$\cap\!\!\cdot$	\bigcapdot	$\dot\sqcup$	$\dot\sqcup$	\bigsqcupdot	$\oint\!\!\!\!\sim$	$\oint\!\!\!\!\sim$	\lcircleleftint
$\cap\!\!+$	$\cap\!\!+$	\bigcapplus	$\sqcup\!\!+$	$\sqcup\!\!+$	\bigsqcupplus	$\oint\!\!\!\!\sim$	$\oint\!\!\!\!\sim$	\lcirclerightint
$\cup$	$\cup$	\bigcup	$\times$	$\times$	\bigtimes	$\oiiint$	$\oiiint$	\oiiint
$\cup\!\!\cdot$	$\cup\!\!\cdot$	\bigcupdot	$\vee$	$\vee$	\bigvee	$\oiint$	$\oiint$	\oiint
$\cup\!\!+$	$\cup\!\!+$	\bigcupplus	$\dot\vee$	$\dot\vee$	\bigveedot	$\oint$	$\oint$	\oint
$\curlyvee$	$\curlyvee$	\bigcurlyvee	$\wedge$	$\wedge$	\bigwedge	Σ	Σ	\osum
$\curlywedge$	$\curlywedge$	\bigcurlywedge	$\dot\wedge$	$\dot\wedge$	\bigwedgedot	$\prod$	$\prod$	\prod
$\Vvee$	$\Vvee$	\bigdoublevee	$\amalg$	$\amalg$	\coprod	$\oint$	$\oint$	\rcircleleftint

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⩓	⩓	\bigdoublewedge	⨍	⨍	\fint	⨔	⨔	\rcirclerightint
⊛	⊛	\bigoast	∫⋯∫	∫⋯∫	\idotsint	∑	∑	\sum
⊙	⊙	\bigodot	⨌	⨌	\iiiint	∑	∑	\sumint
⊕	⊕	\bigoplus	∭	∭	\iiint	∐	∐	\varcoprod
⊗	⊗	\bigotimes	∬	∬	\iint	⨋	⨋	\varosum
+	+	\bigplus	∫	∫	\int	∏	∏	\varprod
⊓	⊓	\bigsqcap	⨍	⨍	\intbar	∑	∑	\varsum
⊡	⊡	\bigsqcapdot	⨏	⨏	\intBar	∑	∑	\varsumint
⊞	⊞	\bigsqcapplus	⨎	⨎	\landdownint			

* 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, \intctrclockwise as a synonym for \landdownint, \modtwosum as a synonym for \osum, \ointclockwise as a synonym for \lcircleleftint, \ointctrclockwise as a synonym for \rcirclerightint, \varmodtwosum as a synonym for \varosum, \varointclockwise as a synonym for \lcirclerightint, and \varointctrclockwise as a synonym for \rcircleleftint.

Table 89: boisik Variable-sized Math Operators

∫	∫	\intup

boisik additionally provides all of the symbols in Table 79.

Table 90: stix Variable-sized Math Operators

$\awint$	\awint		$\coprod$	\coprod		$\oiiint$	\oiiint	
$\Bbbsum$	\Bbbsum		$\bigvee$	\disjquant		$\oiint$	\oiint	
$\bigcap$	\bigcap		$\fint$	\fint		$\oint$	\oint	
$\bigcup$	\bigcup		$\iiiint$	\iiiint		$\ointctrclockwise$	\ointctrclockwise	
$\bigcupdot$	\bigcupdot		$\iiint$	\iiint		$\pointint$	\pointint	
$\bigodot$	\bigodot		$\iint$	\iint		$\prod$	\prod	
$\bigoplus$	\bigoplus		$\int$	\int		$\rppolint$	\rppolint	
$\bigotimes$	\bigotimes		$\intbar$	\intbar		$\scpolint$	\scpolint	
$\bigsqcap$	\bigsqcap		$\intBar$	\intBar		$\sqint$	\sqint	
$\bigsqcup$	\bigsqcup		$\intcap$	\intcap		$\sum$	\sum	
$\bigtalloblong$	\bigtalloblong		$\intclockwise$	\intclockwise		$\sumint$	\sumint	
$\bigtimes$	\bigtimes		$\intcup$	\intcup		$\upint$	\upint	
$\biguplus$	\biguplus		$\intlarhk$	\intlarhk		$\varointclockwise$	\varointclockwise	
$\bigvee$	\bigvee		$\intx$	\intx		$\xbsol$	\xbsol	
$\bigwedge$	\bigwedge		$\lowint$	\lowint		$\xsol$	\xsol	
$\cirfnint$	\cirfnint		$\modtwosum$	\modtwosum				

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⋀	⋀	`\conjquant`	∮	∮	`\npolint`

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

Table 91: stix Integrals with Explicit Slant

∫	∫	`\intsl`	∫	∫	`\intup`
∬	∬	`\iintsl`	∬	∬	`\iintup`
∭	∭	`\iiintsl`	∭	∭	`\iiintup`
∮	∮	`\ointsl`	∮	∮	`\ointup`
∯	∯	`\oiintsl`	∯	∯	`\oiintup`
∰	∰	`\oiiintsl`	∰	∰	`\oiiintup`
∱	∱	`\intclockwisesl`	∱	∱	`\intclockwiseup`
∮	∮	`\varointclockwisesl`	∮	∮	`\varointclockwiseup`
∮	∮	`\ointctrclockwisesl`	∮	∮	`\ointctrclockwiseup`
∑	∑	`\sumintsl`	∑	∑	`\sumintup`

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$\iiiint$	$\iiiint$	`\iiiintsl`	$\iiiint$	$\iiiint$	`\iiiintup`
$⨍$	$⨍$	`\intbarsl`	$⨎$	$⨎$	`\intbarup`
$⨏$	$⨏$	`\intBarsl`	$⨐$	$⨐$	`\intBarup`
$⨑$	$⨑$	`\fintsl`	$⨒$	$⨒$	`\fintup`
$⨐$	$⨐$	`\cirfnintsl`	$⨍$	$⨍$	`\cirfnintup`
$⨑$	$⨑$	`\awintsl`	$⨒$	$⨒$	`\awintup`
$⨒$	$⨒$	`\rppolintsl`	$⨓$	$⨓$	`\rppolintup`
$⨓$	$⨓$	`\scpolintsl`	$⨔$	$⨔$	`\scpolintup`
$⨔$	$⨔$	`\npolintsl`	$⨕$	$⨕$	`\npolintup`
$⨕$	$⨕$	`\pointintsl`	$⨖$	$⨖$	`\pointintup`
$⨖$	$⨖$	`\sqintsl`	$⨗$	$⨗$	`\sqintup`
$⨗$	$⨗$	`\intlarhksl`	$⨘$	$⨘$	`\intlarhkup`
$⨘$	$⨘$	`\intxsl`	$⨙$	$⨙$	`\intxup`
$⨙$	$⨙$	`\intcapsl`	$⨚$	$⨚$	`\intcapup`
$⨚$	$⨚$	`\intcupsl`	$⨛$	$⨛$	`\intcupup`
$⨛$	$⨛$	`\upintsl`	$⨜$	$⨜$	`\upintup`

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$\lowintsl$ `\lowintsl` $\lowintup$ `\lowintup`

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

Table 92: cmupint Variable-sized Upright Integrals

$\awint$	`\awint`		$\npolint$	`\npolint`	
$\barint$	`\barint`		$\oiiint$	`\oiiint`	
$\cirfnint$	`\cirfnint`		$\oiint$	`\oiint`	
$\doublebarint$	`\doublebarint`		$\oint$	`\oint`	
$\downint$	`\downint`		$\ointclockwise$	`\ointclockwise`	
$\fint$	`\fint`		$\ointctrclockwise$	`\ointctrclockwise`	
$\idotsint^*$	`\idotsint`*		$\pointint$	`\pointint`	
$\iiiint$	`\iiiint`		$\rppolint$	`\rppolint`	
$\iiint$	`\iiint`		$\scpolint$	`\scpolint`	

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$\iint$	$\iint$	`\iint`	$\iiint$	$\iiint$	`\sqiint`
$\int$	$\int$	`\int`	$\oint$	$\oint$	`\sqint`
$\intcap$	$\intcap$	`\intcap`	$\sum\!\!\!\!\int$	$\sum\!\!\!\!\int$	`\sumint`
$\intclockwise$	$\intclockwise$	`\intclockwise`	$\overline{\int}$	$\overline{\int}$	`\upint`
$\intcup$	$\intcup$	`\intcup`	$\int\cdots\int$	$\int\cdots\int$	`\varidotsint`*
$\intlarhk$	$\intlarhk$	`\intlarhk`	$\varointclockwise$	$\varointclockwise$	`\varointclockwise`
$\landdownint$	$\landdownint$	`\landdownint`	$\varointctrclockwise$	$\varointctrclockwise$	`\varointctrclockwise`
$\landupint$	$\landupint$	`\landupint`	$\xint$	$\xint$	`\xint`

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

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

Table 93: mathdesign Variable-sized Math Operators

$\intclockwise$	$\intclockwise$	`\intclockwise`	$\ointclockwise$	$\ointclockwise$	`\ointclockwise`
$\oiiint$	$\oiiint$	`\oiiint`	$\ointctrclockwise$	$\ointctrclockwise$	`\ointctrclockwise`
$\oiint$	$\oiint$	`\oiint`			

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

Table 94: pdfMsym Variable-sized Math Operators

⨍	⨍	\aint	⨈	⨈	\bigforall
⩀	⩀	\bigcircwedge	⨌	⨌	\biNint{5}*
⩊	⩊	\bigdcup	∭	∭	\iNint{5}*
⩀	⩀	\bigdwedge	⨌	⨌	\oiNint{5}*
∃	∃	\bigexists			

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

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

.

Table 95: prodint Variable-sized Math Operators

∏	\prodi	∏	\Prodi	∏	\PRODI

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

Table 96: pdfMsym Extensible Math Operators

$\prod$	`\prood`	$\sum$	`\suum`

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

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

produces

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

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

Table 97: cmll Large Math Operators

$\parr$	`\bigparr`*	$\&$	`\bigwith`

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

Table 98: Binary Relations

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

* Not predefined by the LaTeX 2$_\varepsilon$ 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, LaTeX typesets the two with different surrounding spacing. Contrast "`P(A | B)`" ↦ "$P(A|B)$" with "`P(A \mid B)`" ↦ "$P(A \mid B)$".

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

≋	\approxeq	≖	\eqcirc	⪸	\succapprox
϶	\backepsilon	≒	\fallingdotseq	⋩	\succcurlyeq
∽	\backsim	⟜	\multimap	≿	\succsim
⋍	\backsimeq	⋔	\pitchfork	∴	\therefore
∵	\because	⪷	\precapprox	≈	\thickapprox
≬	\between	≼	\preccurlyeq	∼	\thicksim
≎	\Bumpeq	≾	\precsim	∝	\varpropto
≏	\bumpeq	≒	\risingdotseq	⊩	\Vdash
≗	\circeq	∣	\shortmid	⊨	\vDash
⋞	\curlyeqprec	∥	\shortparallel	⫦	\Vvdash
⋟	\curlyeqsucc	⌢	\smallfrown		
≒	\doteqdot	⌣	\smallsmile		

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

≇	\ncong	∦	\nshortparallel	⊯	\nVDash
∤	\nmid	≁	\nsim	⪺	\precnapprox
∦	\nparallel	⊁	\nsucc	⋨	\precnsim
⊀	\nprec	⋡	\nsucceq	⪺	\succnapprox
⋠	\npreceq	⊮	\nvDash	⋩	\succnsim
∤	\nshortmid	⊬	\nvdash		

Table 101: stmaryrd Binary Relations

∈	\inplus	∋	\niplus

Table 102: wasysym Binary Relations

⌐	\invneg	⇝	\leadsto	∝	\wasypropto
⋈	\Join	⊛	\logof		

Table 103: txfonts/pxfonts Binary Relations

⊘	\circledgtr	⋉	\lJoin	×	\opentimes
⊘	\circledless	⋈	\lrtimes	⫫	\Perp
:≈	\colonapprox	⊸	\multimap	≦	\preceqq
::≈	\Colonapprox	⊶	\multimapboth	⪊	\precneqq
:−	\coloneq	⚬	\multimapbothvert	⋊	\rJoin
::−	\Coloneq	⊸	\multimapdot	⊱	\strictfi
::=	\Coloneqq	⊷	\multimapdotboth	⊰	\strictif
:=	\coloneqq*	⊶	\multimapdotbothA	⊱	\strictiff
::∼	\Colonsim	⚬	\multimapdotbothAvert	≧	\succeqq
:∼	\colonsim	⊷	\multimapdotbothB	⪋	\succneqq
−::	\Eqcolon	⚬	\multimapdotbothBvert	∥	\varparallel
−:	\eqcolon	⚬	\multimapdotbothvert	∦	\varparallelinv
=:	\eqqcolon	⊷	\multimapdotinv	⊫	\VvDash
=::	\Eqqcolon	⊶	\multimapinv		
≂	\eqsim	×	\openJoin		

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

Table 104: txfonts/pxfonts Negated Binary Relations

≇	\napproxeq	⋠	\npreccurlyeq	≉	\nthickapprox
≁	\nasymp	⋢	\npreceqq	↞	\ntwoheadleftarrow
⋍	\nbacksim	⋡	\nprecsim	↠	\ntwoheadrightarrow
≠	\nbacksimeq	≉	\nsimeq	∦	\nvarparallel
≠	\nbumpeq	⋣	\nsuccapprox	∦	\nvarparallelinv
≠	\nBumpeq	⋡	\nsucccurlyeq	⊮	\nVdash
≢	\nequiv	⋣	\nsucceqq		
⋡	\nprecapprox	⋡	\nsuccsim		

Table 105: mathabx Binary Relations

≀	\between	∣	\divides	≔	\risingdotseq
≑	\botdoteq	≑	\dotseq	≳	\succapprox
≎	\Bumpedeq	≎	\eqbumped	≽	\succcurlyeq
≏	\bumpedeq	≏	\eqcirc	≻	\succdot
≗	\circeq	≔	\eqcolon	≿	\succsim
≔	\coloneq	≒	\fallingdotseq	∴	\therefore
≙	\corresponds	≫	\ggcurly	≐	\topdoteq
≼	\curlyeqprec	≪	\llcurly	⊨	\vDash
≽	\curlyeqsucc	≲	\precapprox	⊩	\Vdash
⫤	\DashV	≼	\preccurlyeq	⊫	\VDash
⫤	\Dashv	≺	\precdot	⊪	\Vvdash
⫥	\dashVv	≲	\precsim		

Table 106: mathabx Negated Binary Relations

≉	\napprox	⫠	\notperp	⊭	\nvDash
≇	\ncong	⊀	\nprec	⊯	\nVDash
⋞	\ncurlyeqprec	⪷	\nprecapprox	⊮	\nVdash
⋟	\ncurlyeqsucc	⋠	\npreccurlyeq	⊬	\nvdash
⊬	\nDashv	⪵	\npreceq	⊮	\nVvash
⊯	\ndashV	⋨	\nprecsim	⪹	\precnapprox
⊬	\ndashv	⊁	\nsim	⪵	\precneq
⊭	\nDashV	≄	\nsimeq	⋨	\precnsim
⊯	\ndashVv	⊁	\nsucc	⪺	\succnapprox
≠	\neq	⪸	\nsuccapprox	⪶	\succneq
≁	\notasymp	⋡	\nsucccurlyeq	⋩	\succnsim
∤	\notdivides	⪶	\nsucceq		
≢	\notequiv	⋩	\nsuccsim		

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 "$a \not= b$" or "$a \neq b$".

Table 107: MnSymbol Binary Relations

≈	\approx	≙	\hateq	⊶	\rightpropto
≅	\approxeq	⤫	\hcrossing	▷	\rightslice
≳	\backapprox	⊢	\leftfootline	⊩	\rightVdash
≅	\backapproxeq	⟵	\leftfree	⊢	\rightvdash
≌	\backcong	⫤	\leftmodels	≒	\risingdotseq
≂	\backeqsim	⫤	\leftModels	↘	\sefootline
∽	\backsim	∝	\leftpropto	↘	\sefree
≃	\backsimeq	—	\leftrightline	⪪	\seModels
≋	\backtriplesim	=	\Leftrightline	⪫	\semodels
≬	\between	◁	\leftslice	)(	\separated
≏	\bumpeq	⊣	\leftVdash	⪬	\seVdash
≎	\Bumpeq	⊣	\leftvdash	⪭	\sevdash
≗	\circeq	↗	\nefootline	∥	\shortparallel
⊡	\closedequal	↗	\nefree	~	\sim
≺	\closedprec	⪩	\neModels	≃	\simeq
≻	\closedsucc	⪨	\nemodels	≻	\succ
≔	\coloneq	⟋	\neswline	≿	\succapprox
≅	\cong	⫽	\Neswline	⪰	\succcurlyeq
⋞	\curlyeqprec	⪯	\neVdash	≥	\succeq
⋟	\curlyeqsucc	⪱	\nevdash	≿	\succsim

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≑	`\Doteq`	⤡	`\nwfootline`	⤢	`\swfootline`
≐	`\doteq`	⤡	`\nwfree`	⤢	`\swfree`
⊥	`\downfootline`	⤡	`\nwmodels`	⤢	`\swModels`
⊥	`\downfree`	⤡	`\nwModels`	⤢	`\swmodels`
⊤	`\downmodels`	⤡	`\nwsecrossing`	⤢	`\swVdash`
⊤	`\downModels`	⤡	`\Nwseline`	⤢	`\swvdash`
⤳	`\downpropto`	⤡	`\nwseline`	≋	`\triplesim`
⊤	`\downvdash`	⤡	`\nwvdash`	∣	`\updownline`
⊤	`\downVdash`	⤡	`\nwVdash`	∥	`\Updownline`
≒	`\eqbump`	≺	`\prec`	⊤	`\upfootline`
≓	`\eqcirc`	≲	`\precapprox`	⊤	`\upfree`
≑	`\eqdot`	≼	`\preccurlyeq`	⊥	`\upModels`
≂	`\eqsim`	≼	`\preceq`	⊥	`\upmodels`
=	`\equal`	≾	`\precsim`	⤳	`\uppropto`
⊟	`\equalclosed`	⊣	`\rightfootline`	⊥	`\upvdash`
≡	`\equiv`	⊣	`\rightfree`	⊥	`\upVdash`
⊟	`\equivclosed`	⊨	`\rightmodels`	⤫	`\vcrossing`
≒	`\fallingdotseq`	⊩	`\rightModels`	⊩	`\Vvdash`

MnSymbol additionally defines synonyms for some of the preceding symbols:

⊣	`\dashv`	(same as `\leftvdash`)
⤡	`\diagdown`	(same as `\nwseline`)
⤢	`\diagup`	(same as `\neswline`)
∣	`\divides`	(same as `\updownline`)
≑	`\doteqdot`	(same as `\Doteq`)
⊨	`\models`	(same as `\rightmodels`)
∥	`\parallel`	(same as `\Updownline`)
⊥	`\perp`	(same as `\upvdash`)
∝	`\propto`	(same as `\leftpropto`)
—	`\relbar`	(same as `\leftrightline`)
═	`\Relbar`	(same as `\Leftrightline`)
∝	`\varpropto`	(same as `\leftpropto`)
⊨	`\vDash`	(same as `\rightmodels`)
⊩	`\VDash`	(same as `\rightModels`)
⊢	`\vdash`	(same as `\rightvdash`)
⊩	`\Vdash`	(same as `\rightVdash`)

Table 108: MnSymbol Negated Binary Relations

≉	\napprox	⊬	\nleftfootline	≠	\nrisingdotseq
≋	\napproxeq	↚	\nleftfree	↘	\nsefootline
≴	\nbackapprox	⊭	\nleftmodels	↘	\nsefree
≴	\nbackapproxeq	⊫	\nleftModels	⊀	\nseModels
≌	\nbackcong	⊣	\nleftrightline	⊀	\nsemodels
≋	\nbackeqsim	⇍	\nLeftrightline	⊀	\nsevdash
≁	\nbacksim	⊣	\nleftvdash	⊀	\nseVdash
≉	\nbacksimeq	⊫	\nleftVdash	∤	\nshortmid
≋	\nbacktriplesim	⊀	\nnefootline	∦	\nshortparallel
≠	\nbumpeq	⊀	\nnefree	≁	\nsim
≠	\nBumpeq	⊀	\nnemodels	≄	\nsimeq
≠	\ncirceq	⊀	\nneModels	⊁	\nsucc
≠	\nclosedequal	⊀	\nneswline	≿	\nsuccapprox
≇	\ncong	⊀	\nNeswline	⊁	\nsucccurlyeq
⋞	\ncurlyeqprec	⊀	\nneVdash	≿	\nsucceq
⋟	\ncurlyeqsucc	⊀	\nnevdash	≿	\nsuccsim
≠	\ndoteq	⊀	\nnwfootline	↙	\nswfootline
≠	\nDoteq	⊀	\nnwfree	↙	\nswfree
⊥	\ndownfootline	⊀	\nnwmodels	⊀	\nswModels
⊥	\ndownfree	⊀	\nnwModels	⊀	\nswmodels
⊤	\ndownModels	⊀	\nNwseline	⊀	\nswvdash
⊤	\ndownmodels	⊀	\nnwseline	⊀	\nswVdash
⊤	\ndownVdash	⊀	\nnwvdash	≋	\ntriplesim
⊤	\ndownvdash	⊀	\nnwVdash	∦	\nUpdownline
≠	\neqbump	⊀	\nprec	∤	\nupdownline
≠	\neqcirc	⊀	\nprecapprox	⊥	\nupfootline
≠	\neqdot	⊀	\npreccurlyeq	⊥	\nupfree
≁	\neqsim	⊀	\npreceq	⊥	\nupModels
≠	\nequal	⊀	\nprecsim	⊥	\nupmodels
≠	\nequalclosed	⊣	\nrightfootline	⊥	\nupVdash
≠	\nequiv	⊣	\nrightfree	⊥	\nupvdash
≠	\nequivclosed	⊫	\nrightModels	⊀	\precnapprox
↯	\neswcrossing	⊭	\nrightmodels	⊀	\precnsim
≒	\nfallingdotseq	⊬	\nrightvdash	⊁	\succnapprox
≠	\nhateq	⊫	\nrightVdash	⊁	\succnsim

MnSymbol additionally defines synonyms for some of the preceding symbols:

⊬	\ndashv	(same as \nleftvdash)
↚	\ndiagdown	(same as \nnwseline)
↛	\ndiagup	(same as \nneswline)
∤	\ndivides	(same as \nupdownline)
≠	\ne	(same as \nequal)
≠	\neq	(same as \nequal)
∤	\nmid	(same as \nupdownline)
⊭	\nmodels	(same as \nrightmodels)
∦	\nparallel	(same as \nUpdownline)
⫫	\nperp	(same as \nupvdash)
⊬	\nrelbar	(same as \nleftrightline)
⊯	\nRelbar	(same as \nLeftrightline)
⊭	\nvDash	(same as \nrightmodels)
⊬	\nvdash	(same as \nrightvdash)
⊮	\nVdash	(same as \nrightVdash)
⊯	\nVDash	(same as \nrightModels)

Table 109: fdsymbol Binary Relations

≈	\approx	≡	\equiv	⊨	\rightmodels
≋	\approxeq	≒	\fallingdotseq	⊩	\rightVdash
≌	\backcong	⌢	\frown	⊫	\rightVDash
∝	\backpropto	≘	\frowneq	⊢	\rightvdash
∽	\backsim	⊂	\frownsmile	⊨	\rightvDash
⋍	\backsimeq	∈	\in	≒	\risingdotseq
≬	\between	⊣	\leftassert	∣	\shortmid
⋈	\bowtie	⫤	\leftAssert	∥	\shortparallel
≏	\bumpeq	⊢	\leftfootline	∼	\sim
≎	\Bumpeq	⫞	\leftmodels	≃	\simeq
≗	\bumpeqq	⊣	\leftvdash	⌣	\smile
≗	\circeq	⫢	\leftvDash	≌	\smileeq
≔	\coloneq	⫤	\leftVdash	⋉	\smilefrown
≅	\cong	⫣	\leftVDash	≛	\stareq
⋌	\crossing	⟝	\longleftfootline	≻	\succ
⋞	\curlyeqprec	⟸⟙	\Longmapsfrom	≳	\succapprox
⋟	\curlyeqsucc	⟻	\longmapsfrom	⋩	\succcurlyeq
⫣	\dashVv	⟞	\longrightfootline	≽	\succeq
⟊	\Ddashv	∣	\mid	≽	\succeqq
≑	\dotcong	∋	\owns	≿	\succsim
≐	\doteq	∥	\parallel	≈	\thickapprox
≒	\Doteq	≺	\prec	∼	\thicksim
∺	\dotsminusdots	≾	\precapprox	≋	\triplesim
⊤	\downAssert	≼	\preccurlyeq	⊥	\upassert

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⊤	\downassert	≼	\preceq	⫫	\upAssert
⊼	\downmodels	≦	\preceqq	⫫	\upmodels
⫪	\downvDash	⋨	\precnapprox	⊥	\upvdash
⫟	\downVdash	⪵	\precneq	⫫	\upvDash
⊤	\downvdash	⪵	\precneqq	⫫	\upVdash
⫪	\downVDash	⋨	\precnsim	⫫	\upVDash
≖	\eqcirc	≾	\precsim	⊨	\vDdash
≕	\eqcolon	∝	\propto	≚	\veeeq
≒	\eqdot	⊢	\rightassert	⊪	\Vvdash
≈	\eqsim	⊩	\rightAssert	≙	\wedgeq
=	\equal	⊣	\rightfootline		

fdsymbol defines synonyms for many of the preceding symbols:

≋	\approxident	⫤	\dashV	⊢	\shortrighttack
≙	\arceq	≒	\doteqdot	⊥	\shortuptack
⊩	\Assert	≕	\eqqcolon	⌢	\smallfrown
⊢	\assert	≙	\hateq	⌣	\smallsmile
≍	\asymp	⋈	\Join	∝	\varpropto
⫟	\Barv	⟙	\longdashv	⫫	\vBar
⫪	\barV	⊨	\models	⫫	\Vbar
⊃	\closure	∋	\ni	⊨	\vDash
≔	\coloneqq	⊥	\perp	⊫	\VDash
⊣	\dashv	∝	\propfrom	⊩	\Vdash
⫤	\DashV	⊤	\shortdowntack	⊢	\vdash
⫤	\Dashv	⊣	\shortlefttack	⟝	\vlongdash

Table 110: fdsymbol Negated Binary Relations

≨	\backsimneqq	∉	\nin	≁	\nsim
≉	\napprox	⫤	\nleftAssert	≄	\nsimeq
≉	\napproxeq	⊬	\nleftassert	≁	\nsmile
≇	\nbackcong	⊢	\nleftfootline	≇	\nsmileeq
≁	\nbacksim	⊭	\nleftmodels	≉	\nsmilefrown
≄	\nbacksimeq	⊯	\nleftvDash	≠	\nstareq
≠	\nbumpeq	⊬	\nleftvdash	⊁	\nsucc
≠	\nBumpeq	⊮	\nleftVdash	⋡	\nsuccapprox
≉	\nbumpeqq	⊯	\nleftVDash	⊁	\nsucccurlyeq
≠	\ncirceq	⟜	\nlongleftfootline	⊁	\nsucceq

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$\not\cong$	`\ncong`	$\not\longleftarrow\!\!\!\!\longmapsto$	`\nLongmapsfrom`	$\not\succeq$	`\nsucceqq`
$\not\curlyeq$	`\ncurlyeqprec`	$\not\longleftarrow\!\!\!\!\longmapsto$	`\nlongmapsfrom`	$\not\succsim$	`\nsuccsim`
$\not\curlyeq$	`\ncurlyeqsucc`	$\not\longrightarrow\!\!\!\!\longmapsto$	`\nlongrightfootline`	$\not\gtrsim$	`\ntriplesim`
$\not\Vdash$	`\ndashVv`	$\not\mid$	`\nmid`	$\not\perp$	`\nupassert`
$\not\Vdash$	`\nDdashv`	$\not\ni$	`\nowns`	$\not\perp$	`\nupAssert`
$\not\doteq$	`\ndoteq`	$\nparallel$	`\nparallel`	$\not\perp$	`\nupmodels`
$\not\doteq$	`\nDoteq`	$\not\prec$	`\nprec`	$\not\perp$	`\nupVDash`
$\not\vdash$	`\ndownassert`	$\not\precapprox$	`\nprecapprox`	$\not\perp$	`\nupvDash`
$\not\vdash$	`\ndownAssert`	$\not\preccurlyeq$	`\npreccurlyeq`	$\not\perp$	`\nupVdash`
$\not\models$	`\ndownmodels`	$\not\preceq$	`\npreceq`	$\not\perp$	`\nupvdash`
$\not\vdash$	`\ndownvdash`	$\not\preceq$	`\npreceqq`	$\not\Vdash$	`\nvDdash`
$\not\vdash$	`\ndownVdash`	$\not\precsim$	`\nprecsim`	$\not\equiv$	`\nveeeq`
$\not\Vdash$	`\ndownVDash`	$\nvdash$	`\nrightassert`	$\nVvdash$	`\nVvdash`
$\not\Vdash$	`\ndownvDash`	$\nVdash$	`\nrightAssert`	$\not\wedge$	`\nwedgeq`
$\not\equiv$	`\neqcirc`	$\not\longrightarrow\!\!\!\!\longmapsto$	`\nrightfootline`	$\not\precsim$	`\precneq`
$\not\doteq$	`\neqdot`	$\not\models$	`\nrightmodels`	$\not\precsim$	`\precneqq`
$\not\simeq$	`\neqsim`	$\nvdash$	`\nrightvdash`	$\not\simeq$	`\simneqq`
$\not=$	`\nequal`	$\nVdash$	`\nrightVdash`	$\not\succapprox$	`\succnapprox`
$\not\equiv$	`\nequiv`	$\not\vdash$	`\nrightvDash`	$\not\succeq$	`\succneq`
$\not\fallingdotseq$	`\nfallingdotseq`	$\not\Vdash$	`\nrightVDash`	$\not\succeq$	`\succneqq`
$\not\frown$	`\nfrown`	$\not\risingdotseq$	`\nrisingdotseq`	$\not\succsim$	`\succnsim`
$\not\frown$	`\nfrowneq`	$\nshortmid$	`\nshortmid`		
$\not\frown$	`\nfrownsmile`	$\nshortparallel$	`\nshortparallel`		

fdsymbol defines synonyms for many of the preceding symbols:

$\not\approx$	`\napproxident`	$\not\Vdash$	`\ndashV`	$\not\vdash$	`\nshortrighttack`
$\not\asymp$	`\narceq`	$\not=$	`\ne`	$\not\perp$	`\nshortuptack`
$\nAssert$	`\nAssert`	$\not=$	`\neq`	$\not\simeq$	`\nsime`
$\nassert$	`\nassert`	$\not\doteq$	`\nhateq`	$\not\perp$	`\nvBar`
$\not\asymp$	`\nasymp`	$\not\longleftarrow\!\!\!\!\longmapsto$	`\nlongdashv`	$\not\perp$	`\nVbar`
$\not\vdash$	`\nBarv`	$\not\models$	`\nmodels`	$\nVdash$	`\nVdash`
$\not\Vdash$	`\nbarV`	$\not\ni$	`\nni`	$\not\models$	`\nvDash`
$\not\sim$	`\nclosure`	$\notin$	`\notin`	$\not\Vdash$	`\nVDash`
$\not\Vdash$	`\nDashV`	$\not\perp$	`\nperp`	$\nvdash$	`\nvdash`
$\not\vdash$	`\nDashv`	$\not\vdash$	`\nshortdowntack`	$\not\longleftarrow$	`\nvlongdash`
$\not\vdash$	`\ndashv`	$\not\dashv$	`\nshortlefttack`		

Table 111: boisik Binary Relations

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

Table 112: boisik Negated Binary Relations

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

Table 113: stix Binary Relations

≈	\approx	⧺	\eqvparsl	⊣	\rightfishtail
≅	\approxeq	≒	\fallingdotseq	⊃	\rightimply
≌	\approxeqq	⋈	\fbowtie	≻	\righttail
≋	\approxident	⋓	\forksnot	≒	\risingdotseq
≙	\arceq	⋔	\forkv	⊐	\rsqhook
⊢	\assert	⌒	\frown	⨾	\ruledelayed
≛	\asteq	⫤	\gleichstark	≻	\scurel
≍	\asymp	≈	\hatapprox	⊤	\shortdowntack
≌	\backcong	⊸	\imageof	⊣	\shortlefttack
∽	\backsim	∈	\in	∣	\shortmid
⋍	\backsimeq	∈̇	\isindot	∥	\shortparallel
⊏	\bagmember	⋹	\isinE	⊥	\shortuptack
⊤	\Barv	∈̄	\isinobar	∼	\sim
⊤	\barV	∈	\isins	≃	\simeq
≀	\between	⋸	\isinvb	≋	\simminussim
⊨	\bNot	∸	\kernelcontraction	≇	\simneqq
⋈	\bowtie	⊸	\leftdbltail	∸	\simrdots
≎	\Bumpeq	⊢	\leftfishtail	⌒	\smallfrown
≏	\bumpeq	⊣	\lefttail	∈	\smallin
≏	\bumpeqq	⋈	\lfbowtie	∋	\smallni
⚲	\cirbot	⋉	\lftimes	⌣	\smallsmile
≗	\circeq	⟝	\longdashv	⧺	\smeparsl
⚲	\cirmid	⊏	\lsqhook	⌣	\smile
⊂	\closure	≜	\measeq	≛	\stareq
⁝⁝=	\Coloneq	∣	\mid	≻	\succ
⁝=	\coloneq	⫰	\midcir	≫	\Succ
≅	\cong	⋔	\mlcp	≳	\succapprox
≅̇	\congdot	⊨	\models	≽	\succcurlyeq
≼	\curlyeqprec	⊸	\multimap	≻	\succeq
≽	\curlyeqsucc	⊶	\multimapinv	≧	\succeqq
-:	\dashcolon	∋	\ni	≋	\succnapprox
⊣	\dashv	∋̄	\niobar	≻	\succneq
⊣⊣	\dashV	∋	\nis	≻	\succneqq
⊣	\Dashv	∋	\nisd	≻	\succnsim
⊣⊣	\DashV	⊣	\Not	≻	\succsim
⊣⊨	\DashVDash	/	\notchar	≈	\thickapprox
⊣⊢	\dashVdash	⊶	\origof	∼	\thicksim
⁝⁝	\ddotseq	∥	\parallel	⋔	\topfork
∈	\disin	⫲	\parsim	⊤	\upfishtail
÷	\Doteq	⊥	\perp	⋓	\upin
≐	\doteq	⋔	\pitchfork	∈̄	\varisinobar
≑	\dotequiv	≺	\prec	∈	\varisins

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∾	\dotsim	⪻	\Prec	⫋	\varniobar
∺	\dotsminusdots	⪷	\precapprox	⊜	\varnis
⊥	\downfishtail	≼	\preccurlyeq	∝	\varpropto
⊸	\dualmap	≺	\preceq	⫟	\varVdash
#	\eparsl	⪳	\preceqq	≐	\vBar
≖	\eqcirc	⪹	\precnapprox	⫫	\Vbar
=:	\eqcolon	⪵	\precneq	∔	\vBarv
≝	\eqdef	⪱	\precneqq	⫦	\Vdash
≒	\eqdot	⪷	\precnsim	⊢	\vdash
==	\eqeq	≾	\precsim	⊨	\vDash
===	\eqeqeq	∝	\propto	⫧	\VDash
≋	\eqqsim	⊰	\prurel	⫢	\vDdash
≃	\eqsim	⫡	\pullback	⋮	\vdots
⋕	\equalparallel	⫠	\pushout	≚	\veeeq
≡	\equiv	≟	\questeq	⩚	\veeonwedge
≣	\Equiv	⫞	\revnmid	|	\vertoverlay
⩷	\equivDD	⋈	\rfbowtie	⟝	\vlongdash
⧣	\equivVert	⋊	\rftimes	⫨	\Vvdash
⧥	\equivVvert	⇾	\rightdbltail	≙	\wedgeq

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

Table 114: stix Negated Binary Relations

⋔	\forks	∦	\nhpar	≄	\nsime
≉	\napprox	∤	\nmid	⊁	\nsucc
≇	\napproxeqq	∌	\nni	⋡	\nsucccurlyeq
≭	\nasymp	∉	\notin	⪰̸	\nsucceq
≎̸	\nBumpeq	∦	\nparallel	⊉	\nvarisinobar
≏̸	\nbumpeq	⊀	\nprec	⊋	\nvarniobar
≇	\ncong	⋠	\npreccurlyeq	⊭	\nvDash
⩭̸	\ncongdot	⪯̸	\npreceq	⊬	\nvdash
≠	\ne	∤	\nshortmid	⫤⃥	\nVDash
≁	\neqsim	∦	\nshortparallel	⫣⃥	\nVdash
≢	\nequiv	≁	\nsim		

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

Table 115: mathtools Binary Relations

::≈	\Colonapprox	:−	\coloneq	−::	\Eqcolon
:≈	\colonapprox	:∼	\colonsim	=:	\eqqcolon
:=	\coloneqq	::∼	\Colonsim	=::	\Eqqcolon
::=	\Coloneqq	::	\dblcolon		
::−	\Coloneq	−:	\eqcolon		

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

$=:=$ "=:=" vs. $=:=$ "=\vcentcolon="

Table 116: turnstile Binary Relations

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

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$\left\|\frac{def}{abc}\right\|$	`\dtdtstile{abc}{def}`	$\left\|\frac{def}{abc}\right.$	`\sdtstile{abc}{def}`	$\left\|\frac{def}{abc}\right\|$	`\tsdtstile{abc}{def}`
$\left\|\frac{def}{abc}\right\|$	`\dtststile{abc}{def}`	$\left\|\frac{def}{abc}\right\|\|$	`\sdttstile{abc}{def}`	$\left\|\frac{def}{abc}\right\|$	`\tsststile{abc}{def}`
$\left\|\frac{def}{abc}\right.$	`\dttstile{abc}{def}`	$\left\|\frac{def}{abc}\right\|$	`\sndtstile{abc}{def}`	$\left\|\frac{def}{abc}\right.$	`\tststile{abc}{def}`
$\left\|\frac{def}{abc}\right\|\|$	`\dtttstile{abc}{def}`	$\left\|\frac{def}{abc}\right\|$	`\snststile{abc}{def}`	$\left\|\frac{def}{abc}\right\|\|$	`\tsttstile{abc}{def}`
$\frac{def}{abc}\Big\|$	`\nddtstile{abc}{def}`	$\left\|\frac{def}{abc}\right.$	`\sntstile{abc}{def}`	$\left\|\frac{def}{abc}\right\|$	`\ttdtstile{abc}{def}`
$\frac{def}{abc}\Big\|$	`\ndststile{abc}{def}`	$\left\|\frac{def}{abc}\right\|\|$	`\snttstile{abc}{def}`	$\left\|\frac{def}{abc}\right\|$	`\ttststile{abc}{def}`
$\frac{def}{abc}$	`\ndtstile{abc}{def}`	$\left\|\frac{def}{abc}\right\|$	`\ssdtstile{abc}{def}`	$\left\|\frac{def}{abc}\right.$	`\tttstile{abc}{def}`
$\frac{def}{abc}\Big\|\|$	`\ndttstile{abc}{def}`	$\left\|\frac{def}{abc}\right\|$	`\ssststile{abc}{def}`	$\left\|\frac{def}{abc}\right\|\|$	`\ttttstile{abc}{def}`
$\frac{def}{abc}\Big\|$	`\nndtstile{abc}{def}`	$\left\|\frac{def}{abc}\right.$	`\sststile{abc}{def}`		
$\frac{def}{abc}\Big\|$	`\nnststile{abc}{def}`	$\left\|\frac{def}{abc}\right\|\|$	`\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 117: trsym Binary Relations

	`\InversTransformHoriz`		`\TransformHoriz`
	`\InversTransformVert`		`\TransformVert`

Table 118: trfsigns Binary Relations

	`\dfourier`		`\Dfourier`
	`\fourier`		`\Fourier`
	`\laplace`		`\Laplace`
	`\ztransf`		`\Ztransf`

Table 119: pdfMsym Binary Relations

⧟	\leftPP	⟌	\longroundedarrow	⥯	\roundedarrow
⟛	\longleftPP	⟍	\longsquaredarrow	▭	\squaredarrow
⧟	\longrightPP	⧟	\rightPP		

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

Table 120: cmll Binary Relations

⌔	\coh	⌒	\scoh
≍	\incoh	⌣	\sincoh
⫫	\Perp	⟂	\simperp
⊶	\multimapboth		

Table 121: colonequals Binary Relations

≈:	\approxcolon	::−	\coloncolonminus	=::	\equalscoloncolon
≈::	\approxcoloncolon	::∼	\coloncolonsim	−:	\minuscolon
:≈	\colonapprox	:=	\colonequals	−::	\minuscoloncolon
::	\coloncolon	:−	\colonminus	:	\ratio
::≈	\coloncolonapprox	:∼	\colonsim	∼:	\simcolon
::=	\coloncolonequals	=:	\equalscolon	∼::	\simcoloncolon

Table 122: fourier Binary Relations

⫽	\nparallelslant	⫻	\parallelslant

Table 123: logix Binary Relations

≡	\ClsEquv	≢	\NotClsEquv	⊀	\NotPre	≺	\Pre
⊃	\ClsImpl	⊅	\NotClsImpl	⋠	\NotPreq	≼	\Preq
⊫	\Conseq	⊯	\NotConseq	⊬	\NotRule	⊢	\Rule
⊪	\DTrpTurn	⊮	\NotDTrpTurn	⊁	\NotSeq	≻	\Seq
⊫	\DTurnDWavy	⊯	\NotDTurnDWavy	⊁	\NotSuc	≻	\Suc
⊩	\DTurnWavy	⊭	\NotDTurnWavy	⋡	\NotSucq	≽	\Sucq
⊨	\Model	⊭	\NotModel	⊮	\NotTrpTurn	⊪	\TrpTurn
⊸	\MulMap	⊸	\NotMulMap	⊮	\NotTurn	⊩	\Turn
⊶	\MulMapDual	⊶	\NotMulMapDual	⊯	\NotTurnDWavy	⊫	\TurnDWavy
⊷	\MulMapInv	⊷	\NotMulMapInv	⊭	\NotTurnWavy	⊩	\TurnWavy

logix requires either LuaLaTeX or XeLaTeX.

Table 124: logix Set Symbols

∈	\In	∌	\NotOwns	:	\Of	∅	\VoidBunch
∉	\NotIn	∅	\NullSet	∋	\Owns		

logix requires either LuaLaTeX or XeLaTeX.

Table 125: Subset and Superset Relations

⊏	\sqsubset*	⊒	\sqsupseteq	⊃	\supset
⊑	\sqsubseteq	⊂	\subset	⊇	\supseteq
⊐	\sqsupset*	⊆	\subseteq		

* Not predefined by the LaTeX 2ε core. Use the latexsym package to expose this symbol.

Table 126: $\mathcal{AMS}$ Subset and Superset Relations

⊄	\nsubseteq	⫅	\subseteqq	⫆	\supsetneqq
⊅	\nsupseteq	⊊	\subsetneq	⊊	\varsubsetneq
⫅̸	\nsupseteqq	⫋	\subsetneqq	⫋	\varsubsetneqq
⊏	\sqsubset	⫗	\Supset	⊋	\varsupsetneq
⊐	\sqsupset	⫆	\supseteqq	⫌	\varsupsetneqq
⋐	\Subset	⊋	\supsetneq		

Table 127: stmaryrd Subset and Superset Relations

⫋	\subsetplus	⫌	\supsetplus
⫅	\subsetpluseq	⫆	\supsetpluseq

Table 128: wasysym Subset and Superset Relations

⊏	\sqsubset	⊐	\sqsupset

Table 129: txfonts/pxfonts Subset and Superset Relations

⋢	\nsqsubset	⋣	\nsqsupseteq	⫐	\nSupset
⋤	\nsqsubseteq	⫋̸	\nSubset		
⋣	\nsqsupset	⫆̸	\nsubseteqq		

Table 130: mathabx Subset and Superset Relations

⋤	\nsqsubset	⋣	\nsupset	⊒	\sqsupseteq	⊇	\supseteq
⋦	\nsqSubset	⋧	\nSupset	⊒	\sqsupseteqq	⊇	\supseteqq
⋢	\nsqsubseteq	⋣	\nsupseteq	⊐	\sqsupsetneq	⊋	\supsetneq
⋦	\nsqsubseteqq	⋧	\nsupseteqq	⊐	\sqsupsetneqq	⊋	\supsetneqq
⋣	\nsqsupset	⊏	\sqsubset	⊂	\subset	⊊	\varsqsubsetneq
⋧	\nsqSupset	⊏	\sqSubset	⋐	\Subset	⊊	\varsqsubsetneqq
⋣	\nsqsupseteq	⊑	\sqsubseteq	⊆	\subseteq	⊋	\varsqsupsetneq
⋧	\nsqsupseteqq	⊑	\sqsubseteqq	⊆	\subseteqq	⊋	\varsqsupsetneqq
⊄	\nsubset	⊊	\sqsubsetneq	⊊	\subsetneq	⊊	\varsubsetneq
⋐	\nSubset	⊊	\sqsubsetneqq	⊊	\subsetneqq	⊊	\varsubsetneqq
⊈	\nsubseteq	⊐	\sqSupset	⊃	\supset	⊋	\varsupsetneq
⊈	\nsubseteqq	⊐	\sqsupset	⋑	\Supset	⊋	\varsupsetneqq

Table 131: MnSymbol Subset and Superset Relations

⋦	\nSqsubset	⊈	\nsubseteq	⊊	\sqsubsetneq	⊆	\subseteq
⊄	\nsqsubset	⊈	\nsubseteqq	⊊	\sqsubsetneqq	⊆	\subseteqq
⊈	\nsqsubseteq	⊅	\nSupset	⊐	\Sqsupset	⊊	\subsetneq
⊈	\nsqsubseteqq	⊅	\nsupset	⊐	\sqsupset	⊊	\subsetneqq
⋧	\nSqsupset	⊉	\nsupseteq	⊒	\sqsupseteq	⋑	\Supset
⊅	\nsqsupset	⊉	\nsupseteqq	⊒	\sqsupseteqq	⊃	\supset
⊉	\nsqsupseteq	⋦	\Sqsubset	⊋	\sqsupsetneq	⊇	\supseteq
⊉	\nsqsupseteqq	⊏	\sqsubset	⊋	\sqsupsetneqq	⊇	\supseteqq
⋐	\nSubset	⊑	\sqsubseteq	⋐	\Subset	⊋	\supsetneq
⊄	\nsubset	⊑	\sqsubseteqq	⊂	\subset	⊋	\supsetneqq

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

Table 132: fdsymbol Subset and Superset Relations

⋤	\nsqsubset	⊈	\nsubseteq	⋥	\sqsubsetneq	⊆	\subseteq
⋦	\nSqsubset	⊉	\nsubseteqq	⋥	\sqsubsetneqq	⊆	\subseteqq
⋢	\nsqsubseteq	⊅	\nsupset	⋱	\sqsupset	⊊	\subsetneq
⋣	\nsqsubseteqq	⊉	\nSupset	⋱	\Sqsupset	⊊	\subsetneqq
⋡	\nsqsupset	⊉	\nsupseteq	⊒	\sqsupseteq	⊃	\supset
⋨	\nSqsupset	⊉	\nsupseteqq	⊒	\sqsupseteqq	⋑	\Supset
⋣	\nsqsupseteq	⊏	\sqsubset	⋣	\sqsupsetneq	⊇	\supseteq
⋣	\nsqsupseteqq	⋐	\Sqsubset	⋣	\sqsupsetneqq	⊇	\supseteqq
⊄	\nsubset	⊑	\sqsubseteq	⊂	\subset	⊋	\supsetneq
⊄	\nSubset	⊑	\sqsubseteqq	⋐	\Subset	⊋	\supsetneqq

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

Table 133: boisik Subset and Superset Relations

⊄	\nsubset	⋐	\sqSubset	⋐	\subsetplus	⊋	\supsetpluseq
⊊	\nsubseteq	⋑	\sqSupset	⋐	\subsetpluseq	⊊	\varsubsetneq
⊊	\nsubseteqq	⊐	\sqsupset	⋑	\Supset	⊊	\varsubsetneqq
⊅	\nsupset	⋐	\Subset	⊇	\supseteqq	⊋	\varsupsetneq
⊉	\nsupseteq	⊆	\subseteqq	⊋	\supsetneq	⊋	\varsupsetneqq
⊉	\nsupseteqq	⊊	\subsetneq	⊋	\supsetneqq		
⊏	\sqsubset	⊊	\subsetneqq	⊋	\supsetplus		

Table 134: stix Subset and Superset Relations

⟈	\bsolhsub	⊒	\sqsupseteq	⊃⊂	\suphsub
⊐	\csub	⋣	\sqsupsetneq	⥻	\suplarr
⊒	\csube	⫍	\subedot	⫄	\supmult
⊐	\csup	⫂	\submult	⋑	\Supset
⊒	\csupe	⥹	\subrarr	⊃	\supset
⇷	\leftarrowsubset	⋐	\Subset	⪌	\supsetapprox
⋢	\nsqsubset	⊂	\subset	⫐	\supsetcirc*
⋣	\nsqsubseteq	⫋	\subsetapprox	⫎	\supsetdot
⋡	\nsqsupset	⫀	\subsetcirc*	⊇	\supseteq
⋣	\nsqsupseteq	⫃	\subsetdot	⫆	\supseteqq
⊄	\nsubset	⊆	\subseteq	⊋	\supsetneq

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⊄	\nsubseteq	⫅	\subseteqq	⫌	\supsetneqq
⫅̸	\nsubseteqq	⊊	\subsetneq	⫄	\supsetplus
⊅	\nsupset	⫋	\subsetneqq	≿	\supsim
⊉	\nsupseteq	⫀	\subsetplus	⫈	\supsub
⫆̸	\nsupseteqq	⊂ ≿	\subsim	⫖	\supsup
⇸	\rightarrowsupset	⫇	\subsub	⊋ ̸	\varsubsetneq
⊏	\sqsubset	⫕	\subsup	⫋ ̸	\varsubsetneqq
⊑	\sqsubseteq	⫘	\supdsub	⫌ ̸	\varsupsetneq
⋤	\sqsubsetneq	⫄̇	\supedot	⫆̸	\varsupsetneqq
⊐	\sqsupset	⟃	\suphsol		

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

Table 135: logix Subset and Superset Relations

⋐	\FntSbset	⋹	\NotStrctFntSbset	⋢	\NotWkSbnch	⊏	\StrctSbmap
⋹	\NotFntSbset	⋥	\NotStrctSbmap	⊑	\Sbmap	⊏	\StrctSbnch
⋥	\NotSbmap	⊄	\NotStrctSbnch	⊑	\Sbnch	⊂	\StrctSbset
⋢	\NotSbnch	⊂	\NotStrctSbset	⊆	\Sbset	⊑	\StrctWkSbnch
⊈	\NotSbset	⊄	\NotStrctWkSbnch	⋐	\StrctFntSbset	⊑	\WkSbnch

logix requires either LuaLaTeX or XeLaTeX.

Table 136: Inequalities

≥	\geq	≫	\gg	≤	\leq	≪	\ll	≠	\neq

Table 137: $\mathcal{AMS}$ Inequalities

⩾	\eqslantgtr	⋗	\gtrdot	⋚	\lesseqgtr	≱	\ngeq
⩽	\eqslantless	⋛̸	\gtreqless	⪋	\lesseqqgtr	≱	\ngeqq
≧	\geqq	⪌	\gtreqqless	⩽	\lessgtr	⋡	\ngeqslant
⩾	\geqslant	≷	\gtrless	≲	\lesssim	≯	\ngtr
⋙	\ggg	≳	\gtrsim	⋘	\lll	≰	\nleq
⪊	\gnapprox	≩	\gvertneqq	⪉	\lnapprox	≰	\nleqq
⪈	\gneq	≦	\leqq	⪇	\lneq	⋠	\nleqslant
≩	\gneqq	⩽	\leqslant	≨	\lneqq	≮	\nless
⋧	\gnsim	⪅	\lessapprox	⋦	\lnsim		
⪆	\gtrapprox	⋖	\lessdot	≨	\lvertneqq		

Table 138: wasysym Inequalities

$\gtrapprox$	\apprge	$\lessapprox$	\apprle

Table 139: txfonts/pxfonts Inequalities

$\ggg$	\ngg	$\ngtrsim$	\ngtrsim	$\nlesssim$	\nlesssim
$\ngtrapprox$	\ngtrapprox	$\nlessapprox$	\nlessapprox	$\lll$	\nll
$\ngtrless$	\ngtrless	$\nlessgtr$	\nlessgtr		

Table 140: mathabx Inequalities

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

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

Table 141: MnSymbol Inequalities

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

MnSymbol additionally defines synonyms for some of the preceding symbols:

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

Table 142: fdsymbol Inequalities

⩾	\eqslantgtr	⩽	\leqslantdot	⪵	\ngtrapprox
⩽	\eqslantless	⪇	\leqslcc	⪯̸	\ngtrcc
≥	\geq	<	\less	⋭	\ngtrclosed
⪰	\geqclosed	≲	\lessapprox	⋡	\ngtrdot
⪘	\geqdot	⪡	\lesscc	⪋̸	\ngtreqless
≧	\geqq	⋖	\lessclosed	⪌̸	\ngtreqqless
⩾	\geqslant	⩿	\lessdot	⪈̸	\ngtreqslantless
⪀	\geqslantdot	≶	\lesseqgtr	≯	\ngtrless
⪺	\geqslcc	⪋	\lesseqqgtr	≱	\ngtrsim
≫	\gg	⪏	\lesseqslantgtr	≰	\nleq
⋙	\ggg	≶	\lessgtr	⪯̸	\nleqclosed
⪊	\gnapprox	≲	\lesssim	⪿	\nleqdot
⪈	\gneq	≪	\ll	⪋̸	\nleqq
≩	\gneqq	⋘	\lll	⩽̸	\nleqslant
⋧	\gnsim	⪅	\lnapprox	⪿	\nleqslantdot
>	\gtr	⪇	\lneq	⪇̸	\nleqslcc
⪆	\gtrapprox	≨	\lneqq	≮	\nless
⪺	\gtrcc	⋦	\lnsim	⪅̸	\nlessapprox
⩺	\gtrclosed	⩽̸	\neqslantgtr	⪡̸	\nlesscc
⪀	\gtrdot	⩽̸	\neqslantless	⋪	\nlessclosed
⋛	\gtreqless	≱	\ngeq	⩿̸	\nlessdot
≩	\gtreqqless	⪰̸	\ngeqclosed	⪋̸	\nlesseqgtr
⪌	\gtreqslantless	⪰̸	\ngeqdot	⪋̸	\nlesseqqgtr
≳	\gtrless	⪌̸	\ngeqq	⪏̸	\nlesseqslantgtr
≳	\gtrsim	⪈̸	\ngeqslant	≴	\nlessgtr
≤	\leq	⪈̸	\ngeqslantdot	≴	\nlesssim
⪯	\leqclosed	⪇̸	\ngeqslcc	≪̸	\nll
⪿	\leqdot	≯	\ngg	⋘̸	\nlll
≦	\leqq	⋙̸	\nggg		
⩽	\leqslant	≯	\ngtr		

fdsymbol defines synonyms for some of the preceding symbols:

≥	\ge	⪿	\lesdot	⪯̸	\ngtcc
⪰	\gescc	⪋	\lesg	⪌̸	\ngtreqlessslant

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⩾	\gesdot	⪋	\lesseqgtrslant	⪉	\nlescc
⪌	\gesl	◁	\lhd	⩄	\nlesdot
⋙	\gggtr	⋘	\llless	⪓	\nlesg
▷	\gtcc	◁	\ltcc	⪓	\nlesseqgtrslant
⪈	\gtreqlessslant	≨	\lvertneqq	⪡	\nltcc
≩	\gvertneqq	⪉	\ngescc	▷	\rhd
≤	\le	⩄	\ngesdot	⊴	\unlhd
⪇	\lescc	⪓	\ngesl	⊵	\unrhd

Table 143: boisik Inequalities

⩾	\eqslantgtr	⪺	\gtcir	⪌	\lesseqqgtr	≱	\ngeq
⩽	\eqslantless	⪆	\gtrapprox	⪋	\lessgtr	≱	\ngeqq
≧	\geqq	⪈	\gtreqless	≲	\lesssim	≱	\ngeqslant
⩾	\geqslant	⪌	\gtreqqless	⋘	\lll	≯	\ngtr
⋙	\ggg	≷	\gtrless	⪅	\lnapprox	≰	\nleq
⪢	\glj	≳	\gtrsim	⪇	\lneq	≰	\nleqq
⪆	\gnapprox	≩	\gvertneqq	≨	\lneqq	≰	\nleqslant
⪈	\gneq	≦	\leqq	⪅	\lnsim	≮	\nless
≩	\gneqq	⩽	\leqslant	≪	\Lt		
⪅	\gnsim	⪅	\lessapprox	⪹	\ltcir		
⩾	\Gt	⪋	\lesseqgtr	≨	\lvertneqq		

Table 144: stix Inequalities

⪘	\egsdot	⩼	\gtquest	⪅	\lnsim
⪗	\elsdot	⪆	\gtrapprox	⪍	\lsime
⋛	\eqgtr	⥸	\gtrarr	⪏	\lsimg
⋚	\eqless	⋗	\gtrdot	≪	\Lt
⪌	\eqqgtr	⪈	\gtreqless	◁	\ltcc

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$\leqq$	`\eqqless`	$\gtreqless$	`\gtreqqless`	$\lessdot$	`\ltcir`
$\geqslant$	`\eqqslantgtr`	$\gtrless$	`\gtrless`	$\lessdot$	`\ltlarr`
$\leqslant$	`\eqqslantless`	$\gtrsim$	`\gtrsim`	$\lessdot$	`\ltquest`
$\geqslant$	`\eqslantgtr`	$\gvertneqq$	`\gvertneqq`	$\lvertneqq$	`\lvertneqq`
$\leqslant$	`\eqslantless`	$\lat$	`\lat`	$\neqslantgtr$	`\neqslantgtr`
$\geq$	`\geq`	$\late$	`\late`	$\neqslantless$	`\neqslantless`
$\geqq$	`\geqq`	$\leftarrowless$	`\leftarrowless`	$\ngeq$	`\ngeq`
$\geqslant$	`\geqqslant`	$\leq$	`\leq`	$\ngeqq$	`\ngeqq`
$\geqslant$	`\geqslant`	$\leqq$	`\leqq`	$\ngeqslant$	`\ngeqslant`
$\gtrless$	`\gescc`	$\leqslant$	`\leqqslant`	$\ngg$	`\ngg`
$\geqslant$	`\gesdot`	$\leqslant$	`\leqslant`	$\ngtr$	`\ngtr`
$\geqslant$	`\gesdoto`	$\lescc$	`\lescc`	$\ngtrless$	`\ngtrless`
$\geqslant$	`\gesdotol`	$\lesdot$	`\lesdot`	$\ngtrsim$	`\ngtrsim`
$\gtrless$	`\gesles`	$\lesdoto$	`\lesdoto`	$\nleq$	`\nleq`
$\gg$	`\gg`	$\lesdotor$	`\lesdotor`	$\nleqq$	`\nleqq`
$\ggg$	`\ggg`	$\lesges$	`\lesges`	$\nleqslant$	`\nleqslant`
$\gggnest$	`\gggnest`	$\lessapprox$	`\lessapprox`	$\nless$	`\nless`
$\gla$	`\gla`	$\lessdot$	`\lessdot`	$\nlessgtr$	`\nlessgtr`
$\glE$	`\glE`	$\lesseqgtr$	`\lesseqgtr`	$\nlesssim$	`\nlesssim`
$\glj$	`\glj`	$\lesseqqgtr$	`\lesseqqgtr`	$\nll$	`\nll`
$\gnapprox$	`\gnapprox`	$\lessgtr$	`\lessgtr`	$\partialmeetcontraction$	`\partialmeetcontraction`
$\gneq$	`\gneq`	$\lesssim$	`\lesssim`	$\rightarrowgtr$	`\rightarrowgtr`
$\gneqq$	`\gneqq`	$\lgE$	`\lgE`	$\simgE$	`\simgE`
$\gnsim$	`\gnsim`	$\ll$	`\ll`	$\simgtr$	`\simgtr`
$\gsime$	`\gsime`	$\lll$	`\lll`	$\simlE$	`\simlE`
$\gsiml$	`\gsiml`	$\lllnest$	`\lllnest`	$\simless$	`\simless`
$\Gt$	`\Gt`	$\lnapprox$	`\lnapprox`	$\smt$	`\smt`
$\gtcc$	`\gtcc`	$\lneq$	`\lneq`	$\smte$	`\smte`
$\gtcir$	`\gtcir`	$\lneqq$	`\lneqq`		

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

Table 145: logix Inequalities and Equalities

⩧	\CircEq	>	\Gr	≯	\NotLs	>	\SbGr
⧁	\CircGr	≥	\Gre	≱	\NotLse	⩾	\SbGre
⧄	\CircGre	<	\Ls	⊁	\NotSbGr	<	\SbLs
⧀	\CircLs	≤	\Lse	⋡	\NotSbGre	⩽	\SbLse
⧅	\CircLse	≠	\NotEq	≺	\NotSbLs	≃	\Sm
≗	\CircSm	⊁	\NotGr	⋠	\NotSbLse		
=	\Eq	≱	\NotGre	≠	\NotSm		

logix requires either LuaLaTeX or XeLaTeX.

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

◀	\blacktriangleleft	⋫	\ntriangleright	⊵	\trianglerighteq
▶	\blacktriangleright	⋭	\ntrianglerighteq	◁	\vartriangleleft
⋪	\ntriangleleft	⊴	\trianglelefteq	▷	\vartriangleright
⋬	\ntrianglelefteq	≜	\triangleq		

Table 147: stmaryrd Triangle Relations

⩽	\trianglelefteqslant	⩾	\trianglerighteqslant
⪡	\ntrianglelefteqslant	⪢	\ntrianglerighteqslant

Table 148: mathabx Triangle Relations

⋪	\ntriangleleft	◁	\triangleleft	◁	\vartriangleleft
⋬	\ntrianglelefteq	⩤	\trianglelefteq	▷	\vartriangleright
⋫	\ntriangleright	▷	\triangleright		
⋭	\ntrianglerighteq	⩥	\trianglerighteq		

Table 149: MnSymbol Triangle Relations

▼	\filledmedtriangledown	△	\largetriangleup	▿	\smalltriangledown
◀	\filledmedtriangleleft	▽	\medtriangledown	◃	\smalltriangleleft
▶	\filledmedtriangleright	◁	\medtriangleleft	▹	\smalltriangleright
▲	\filledmedtriangleup	▷	\medtriangleright	▵	\smalltriangleup
▾	\filledtriangledown	△	\medtriangleup	≜	\triangleeq
◂	\filledtriangleleft	≠	\ntriangleeq	⊴	\trianglelefteq
▸	\filledtriangleright	⋪	\ntriangleleft	⊵	\trianglerighteq
▴	\filledtriangleup	⋬	\ntrianglelefteq	◁	\vartriangleleft
▽	\largetriangledown	⋫	\ntriangleright	▷	\vartriangleright
◁	\largetriangleleft	⋭	\ntrianglerighteq		
▷	\largetriangleright	⟁	\otriangle		

MnSymbol additionally defines synonyms for many of the preceding symbols: \triangleq 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; \nlessclosed is a synonym for \ntriangleleft; \ngtrclosed is a synonym for \ntriangleright; \nleqclosed is a synonym for \ntrianglelefteq; and \ngeqclosed is a synonym for \ntrianglerighteq.

The title "Triangle Relations" is a bit of a misnomer here as only \triangleeq and \ntriangleeq are defined as 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 150: fdsymbol Triangle Relations

⊵	\geqclosed	▽	\medtriangledown	◂	\smallblacktriangleleft
▷	\gtrclosed	◁	\medtriangleleft	▸	\smallblacktriangleright
▽	\largetriangledown	▷	\medtriangleright	▴	\smallblacktriangleup
△	\largetriangleup	△	\medtriangleup	▿	\smalltriangledown
⊴	\leqclosed	⋬	\ngeqclosed	◁	\smalltriangleleft
◁	\lessclosed	⋪	\ngtrclosed	▷	\smalltriangleright
▼	\medblacktriangledown	⋭	\nleqclosed	△	\smalltriangleup
◀	\medblacktriangleleft	⋪	\nlessclosed	≜	\triangleeq
▶	\medblacktriangleright	⋭	\ntriangleeq		
▲	\medblacktriangleup	▼	\smallblacktriangledown		

fdsymbol defines synonyms for almost all of the preceding symbols:

▽	\bigtriangledown	⋬	\ntrianglelefteq	≜	\triangleq
△	\bigtriangleup	⋫	\ntriangleright	▷	\triangleright
▲	\blacktriangle	⋭	\ntrianglerighteq	⊵	\trianglerighteq
▼	\blacktriangledown	△	\triangle	△	\vartriangle
◀	\blacktriangleleft	▽	\triangledown	◁	\vartriangleleft
▶	\blacktriangleright	◁	\triangleleft	▷	\vartriangleright
⋪	\ntriangleleft	⊴	\trianglelefteq		

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

Table 151: boisik Triangle Relations

⋪	\ntriangleleft	⊴	\trianglelefteq	◿	\varlrttriangle
⋬	\ntrianglelefteq	⩽	\trianglelefteqslant	△	\vartriangle
⋫	\ntriangleright	▹	\triangleright	◁	\vartriangleleft
⋭	\ntrianglerighteq	⊵	\trianglerighteq	▷	\vartriangleright
◃	\triangleleft	⩾	\trianglerighteqslant		

Table 152: stix Triangle Relations

⧍	\lrtriangleeq	⋫	\nvartriangleright	△	\vartriangle
⧏	\ltrivb	⧐	\rtriltri	◁	\vartriangleleft
⋬	\ntrianglelefteq	⊴	\trianglelefteq	▷	\vartriangleright
⋭	\ntrianglerighteq	≜	\triangleq	⧐	\vbrtri
⋪	\nvartriangleleft	⊵	\trianglerighteq		

Table 153: Arrows

$\Downarrow$	\Downarrow	$\longleftarrow$	\longleftarrow	$\nwarrow$	\nwarrow
$\downarrow$	\downarrow	$\Longleftarrow$	\Longleftarrow	$\Rightarrow$	\Rightarrow
$\hookleftarrow$	\hookleftarrow	$\longleftrightarrow$	\longleftrightarrow	$\rightarrow$	\rightarrow
$\hookrightarrow$	\hookrightarrow	$\Longleftrightarrow$	\Longleftrightarrow	$\searrow$	\searrow
$\leadsto$	\leadsto*	$\longmapsto$	\longmapsto	$\swarrow$	\swarrow
$\leftarrow$	\leftarrow	$\Longrightarrow$	\Longrightarrow	$\uparrow$	\uparrow
$\Leftarrow$	\Leftarrow	$\longrightarrow$	\longrightarrow	$\Uparrow$	\Uparrow
$\Leftrightarrow$	\Leftrightarrow	$\mapsto$	\mapsto	$\updownarrow$	\updownarrow
$\leftrightarrow$	\leftrightarrow	$\nearrow$	\nearrow†	$\Updownarrow$	\Updownarrow

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

† See the note beneath Table 270 for information about how to put a diagonal arrow across a mathematical expression (as in "$\not\nabla \cdot \vec{B} \overset{0}{\nearrow}$") .

Table 154: Harpoons

$\leftharpoondown$	\leftharpoondown	$\rightharpoondown$	\rightharpoondown	$\rightleftharpoons$	\rightleftharpoons
$\leftharpoonup$	\leftharpoonup	$\rightharpoonup$	\rightharpoonup		

Table 155: textcomp Text-mode Arrows

$\downarrow$	\textdownarrow	$\rightarrow$	\textrightarrow
$\leftarrow$	\textleftarrow	$\uparrow$	\textuparrow

Table 156: $\mathcal{AMS}$ Arrows

$\circlearrowleft$	\circlearrowleft	$\leftleftarrows$	\leftleftarrows	$\rightleftarrows$	\rightleftarrows
$\circlearrowright$	\circlearrowright	$\leftrightarrows$	\leftrightarrows	$\rightrightarrows$	\rightrightarrows
$\curvearrowleft$	\curvearrowleft	$\leftrightsquigarrow$	\leftrightsquigarrow	$\rightsquigarrow$	\rightsquigarrow
$\curvearrowright$	\curvearrowright	$\Lleftarrow$	\Lleftarrow	$\Rsh$	\Rsh
$\dashleftarrow$	\dashleftarrow	$\looparrowleft$	\looparrowleft	$\twoheadleftarrow$	\twoheadleftarrow
$\dashrightarrow$	\dashrightarrow	$\looparrowright$	\looparrowright	$\twoheadrightarrow$	\twoheadrightarrow
$\downdownarrows$	\downdownarrows	$\Lsh$	\Lsh	$\upuparrows$	\upuparrows
$\leftarrowtail$	\leftarrowtail	$\rightarrowtail$	\rightarrowtail		

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

$\nLeftarrow$	\nLeftarrow	$\nLeftrightarrow$	\nLeftrightarrow	$\nRightarrow$	\nRightarrow
$\nleftarrow$	\nleftarrow	$\nleftrightarrow$	\nleftrightarrow	$\nrightarrow$	\nrightarrow

Table 158: $\mathcal{AMS}$ Harpoons

⇂	\downharpoonleft	⇋	\leftrightharpoons	↿	\upharpoonleft
⇃	\downharpoonright	⇌	\rightleftharpoons	↾	\upharpoonright

Table 159: stmaryrd Arrows

⇽	\leftarrowtriangle	⇚	\Mapsfrom	←	\shortleftarrow
⇿	\leftrightarroweq	↤	\mapsfrom	→	\shortrightarrow
⇹	\leftrightarrowtriangle	⇛	\Mapsto	↑	\shortuparrow
↯	\lightning	↗	\nnearrow	↘	\ssearrow
⟸	\Longmapsfrom	↖	\nnwarrow	↙	\sswarrow
⟻	\longmapsfrom	⇾	\rightarrowtriangle		
⟹	\Longmapsto	↓	\shortdownarrow		

Table 160: txfonts/pxfonts Arrows

⇐⊡	\boxdotLeft	⊙→	\circleddotright	↩◇	\Diamondleft
←⊡	\boxdotleft	←○	\circleleft	◇→	\Diamondright
⊡→	\boxdotright	○→	\circleright	◇⇨	\DiamondRight
⊡⇒	\boxdotRight	⇢	\dashleftrightarrow	⇜	\leftsquigarrow
⇐□	\boxLeft	⇐◈	\DiamonddotLeft	⇗	\Nearrow
←□	\boxleft	←◈	\Diamonddotleft	⇖	\Nwarrow
□→	\boxright	◈→	\Diamonddotright	⇛	\Rrightarrow
□⇒	\boxRight	◈⇨	\DiamonddotRight	⇘	\Searrow
←⊙	\circleddotleft	⇐◇	\DiamondLeft	⇙	\Swarrow

Table 161: mathabx Arrows

↺	\circlearrowleft	←	\leftarrow	↖	\nwarrow
↻	\circlearrowright	⇇	\leftleftarrows	↾	\restriction
↶	\curvearrowbotleft	↔	\leftrightarrow	→	\rightarrow
↭	\curvearrowbotleftright	⇆	\leftrightarrows	⇄	\rightleftarrows
↷	\curvearrowbotright	↭	\leftrightsquigarrow	⇉	\rightrightarrows
↶	\curvearrowleft	↜	\leftsquigarrow	⇝	\rightsquigarrow
↭	\curvearrowleftright	↺	\lefttorightarrow	↩	\righttoleftarrow
↷	\curvearrowright	↫	\looparrowdownleft	↱	\Rsh
↲	\dlsh	↬	\looparrowdownright	↘	\searrow
⇊	\downdownarrows	↫	\looparrowleft	↙	\swarrow
↺	\downtouparrow	↬	\looparrowright	↑↓	\updownarrows
↓↑	\downuparrows	↰	\Lsh	↺	\uptodownarrow
↳	\drsh	↗	\nearrow	↑↑	\upuparrows

Table 162: mathabx Negated Arrows

⇍	\nLeftarrow	↮	\nleftrightarrow	↛	\nrightarrow
↚	\nleftarrow	⇎	\nLeftrightarrow	⇏	\nRightarrow

Table 163: mathabx Harpoons

⥋	\barleftharpoon	↼	\leftharpoonup	⥤	\rightleftharpoons
⥊	\barrightharpoon	⇇	\leftleftharpoons	⇉	\rightrightharpoons
⥥	\downdownharpoons	↽	\leftrightharpoon	⥮	\updownharpoons
⇃	\downharpoonleft	⇋	\leftrightharpoons	↿	\upharpoonleft
⇂	\downharpoonright	⥌	\rightbarharpoon	↾	\upharpoonright
⥯	\downupharpoons	⇁	\rightharpoondown	⥣	\upupharpoons
⥎	\leftbarharpoon	⇀	\rightharpoonup		
↽	\leftharpoondown	⇀	\rightleftharpoon		

Table 164: MnSymbol Arrows

⤵	\curvearrowdownup	⟵	\longleftarrow	↙	\rhookswarrow
↭	\curvearrowleftright	⟸	\Longleftarrow	↾	\rhookuparrow
↶	\curvearrownesw	⟷	\longleftrightarrow	→	\rightarrow
↷	\curvearrownwse	⟺	\Longleftrightarrow	⇒	\Rightarrow
⇜	\curvearrowrightleft	⟼	\longmapsto	↣	\rightarrowtail
↷	\curvearrowsenw	⟶	\longrightarrow	⇄	\rightleftarrows
↶	\curvearrowswne	⟹	\Longrightarrow	⇝	\rightlsquigarrow
↭	\curvearrowupdown	↫	\looparrowleft	↦	\rightmapsto
⇣	\dasheddownarrow	↬	\looparrowright	⇉	\rightrightarrows
⇠	\dashedleftarrow	↰	\Lsh	⇝	\rightrsquigarrow
⇗	\dashednearrow	↗	\nearrow	⇛	\Rrightarrow
⇖	\dashednwarrow	⇗	\Nearrow	↱	\Rsh
⇢	\dashedrightarrow	↗	\nearrowtail	↘	\searrow
⇘	\dashedsearrow	↗	\nelsquigarrow	⇘	\Searrow
⇙	\dashedswarrow	⤢	\nemapsto	↘	\searrowtail
⇡	\dasheduparrow	⇗	\nenearrows	↘	\selsquigarrow
⇓	\Downarrow	↗	\nersquigarrow	↘	\semapsto
↓	\downarrow	↙	\neswarrow	⇘	\senwarrows
↡	\downarrowtail	⇙	\Neswarrow	↘	\sersquigarrow
⇊	\downdownarrows	⇙	\neswarrows	⇘	\sesearrows
⇂	\downlsquigarrow	↖	\nwarrow	↯	\squigarrowdownup
↧	\downmapsto	⇖	\Nwarrow	↭	\squigarrowleftright

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⇜	\downrsquigarrow	↖	\nwarrowtail	↔	\squigarrownesw
⇵	\downuparrows	↖	\nwlsquigarrow	⇕	\squigarrownwse
↻	\lcirclearrowdown	↖	\nwmapsto	↗	\squigarrowrightleft
↺	\lcirclearrowleft	↖	\nwnwarrows	↘	\squigarrowsenw
↻	\lcirclearrowright	↖	\nwrsquigarrow	↗	\squigarrowswne
↻	\lcirclearrowup	↘	\nwsearrow	⇕	\squigarrowupdown
↻	\lcurvearrowdown	↘	\Nwsearrow	↙	\swarrow
↺	\lcurvearrowleft	↘	\nwsearrows	↙	\Swarrow
↱	\lcurvearrowne	↺	\partialvardlcircleleftint*	↙	\swarrowtail
↰	\lcurvearrownw	↻	\partialvardlcirclerightint*	↙	\swlsquigarrow
↷	\lcurvearrowright	↺	\partialvardrcircleleftint*	↙	\swmapsto
↷	\lcurvearrowse	↻	\partialvardrcirclerightint*	↙	\swnearrows
↲	\lcurvearrowsw	↺	\partialvartlcircleleftint*	↙	\swrsquigarrow
↱	\lcurvearrowup	↻	\partialvartlcirclerightint*	↙	\swswarrows
⇐	\Leftarrow	↺	\partialvartrcircleleftint*	↓	\twoheaddownarrow
←	\leftarrow	↻	\partialvartrcirclerightint*	↞	\twoheadleftarrow
↢	\leftarrowtail	↻	\rcirclearrowdown	↗	\twoheadnearrow
⇇	\leftleftarrows	↺	\rcirclearrowleft	↖	\twoheadnwarrow
↜	\leftlsquigarrow	↻	\rcirclearrowright	↠	\twoheadrightarrow
↤	\leftmapsto	↺	\rcirclearrowup	↘	\twoheadsearrow
↔	\leftrightarrow	↻	\rcurvearrowdown	↙	\twoheadswarrow
⇔	\Leftrightarrow	↶	\rcurvearrowleft	↑	\twoheaduparrow
⇆	\leftrightarrows	↱	\rcurvearrowne	↑	\uparrow
↜	\leftrsquigarrow	↰	\rcurvearrownw	⇑	\Uparrow
↓	\lhookdownarrow	↷	\rcurvearrowright	↑	\uparrowtail
↩	\lhookleftarrow	↳	\rcurvearrowse	↕	\updownarrow
↗	\lhooknearrow	↶	\rcurvearrowsw	⇕	\Updownarrow
↖	\lhooknwarrow	↰	\rcurvearrowup	⇅	\updownarrows
↪	\lhookrightarrow	↓	\rhookdownarrow	↑	\uplsquigarrow
↘	\lhooksearrow	↩	\rhookleftarrow	↑	\upmapsto
↙	\lhookswarrow	↗	\rhooknearrow	↑	\uprsquigarrow
↑	\lhookuparrow	↖	\rhooknwarrow	⇈	\upuparrows
↯	\lightning	↪	\rhookrightarrow		
⇚	\Lleftarrow	↘	\rhooksearrow		

MnSymbol additionally defines synonyms for some of the preceding symbols:

↺	\circlearrowleft	(same as \rcirclearrowup)
↻	\circlearrowright	(same as \lcirclearrowup)
↶	\curvearrowleft	(same as \rcurvearrowleft)
↷	\curvearrowright	(same as \lcurvearrowright)
←-	\dashleftarrow	(same as \dashedleftarrow)
-→	\dashrightarrow	(same as \dashedrightarrow)
↩	\hookleftarrow	(same as \rhookleftarrow)
↪	\hookrightarrow	(same as \lhookrightarrow)
⇝	\leadsto	(same as \rightlsquigarrow)
↔	\leftrightsquigarrow	(same as \squigarrowleftright)
↦	\mapsto	(same as \rightmapsto)
⇝	\rightsquigarrow	(same as \rightlsquigarrow)

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

Table 165: MnSymbol Negated Arrows

	\ncurvearrowdownup		\nlhooknwarrow		\nrightleftarrows
	\ncurvearrowleftright		\nlhookrightarrow		\nrightlsquigarrow
	\ncurvearrownesw		\nlhooksearrow		\nrightmapsto
	\ncurvearrownwse		\nlhookswarrow		\nrightrightarrows
	\ncurvearrowrightleft		\nlhookuparrow		\nrightrsquigarrow
	\ncurvearrowsenw		\nLleftarrow		\nRrightarrow
	\ncurvearrowswne		\nnearrow		\nSearrow
	\ncurvearrowupdown		\nNearrow		\nsearrow
	\ndasheddownarrow		\nnearrowtail		\nsearrowtail
	\ndashedleftarrow		\nnelsquigarrow		\nselsquigarrow
	\ndashednearrow		\nnemapsto		\nsemapsto
	\ndashednwarrow		\nnenearrows		\nsenwarrows
	\ndashedrightarrow		\nnersquigarrow		\nsersquigarrow
	\ndashedsearrow		\nNeswarrow		\nsesearrows
	\ndashedswarrow		\nneswarrow		\nsquigarrowdownup
	\ndasheduparrow		\nneswarrows		\nsquigarrowleftright
	\ndownarrow		\nNwarrow		\nsquigarrownesw
	\nDownarrow		\nnwarrow		\nsquigarrownwse
	\ndownarrowtail		\nnwarrowtail		\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		\ntwoheadnwarrow
	\nlcurvearrowsw		\nrcurvearrowright		\ntwoheadrightarrow
	\nlcurvearrowup		\nrcurvearrowse		\ntwoheadsearrow
	\nLeftarrow		\nrcurvearrowsw		\ntwoheadswarrow
	\nleftarrow		\nrcurvearrowup		\ntwoheaduparrow

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↞	\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
↚	\nlhookleftarrow	⇏	\nRightarrow	↾↾	\nupuparrows
↗	\nlhooknearrow	↣	\nrightarrowtail		

MnSymbol additionally defines synonyms for some of the preceding symbols:

↺	\ncirclearrowleft	(same as \nrcirclearrowup)
↻	\ncirclearrowright	(same as \nlcirclearrowup)
↶	\ncurvearrowleft	(same as \nrcurvearrowleft)
↷	\ncurvearrowright	(same as \nlcurvearrowright)
-/→	\ndasharrow	(same as \ndashedrightarrow)
←/-	\ndashleftarrow	(same as \ndashedleftarrow)
-/→	\ndashrightarrow	(same as \ndashedrightarrow)
↚	\ngets	(same as \nleftarrow)
↚	\nhookleftarrow	(same as \nrhookleftarrow)
↪	\nhookrightarrow	(same as \nlhookrightarrow)
⇝	\nleadsto	(same as \nrightlsquigarrow)
↭	\nleftrightsquigarrow	(same as \nsquigarrowleftright)
↦	\nmapsto	(same as \nrightmapsto)
⇝	\nrightsquigarrow	(same as \nrightlsquigarrow)
↛	\nto	(same as \nrightarrow)

Table 166: MnSymbol Harpoons

⇂	\downharpoonccw*	⥥	\neswharpoons	⇘	\seharpooncw
⇃	\downharpooncw*	⇗	\neswharpoonsenw	⥧	\senwharpoons
⥯	\downupharpoons	↖	\nwharpoonccw	↙	\swharpoonccw
↽	\leftharpoonccw*	↖	\nwharpooncw	↙	\swharpooncw
↼	\leftharpooncw*	↘	\nwseharpoonnesw	⥨	\swneharpoons
⥎	\leftrightharpoondownup	⥩	\nwseharpoons	⥊	\updownharpoonleftright
⇋	\leftrightharpoons	↘	\nwseharpoonswne	⥋	\updownharpoonrightleft
⥊	\leftrightharpoonupdown	⇀	\rightharpoonccw*	⥮	\updownharpoons
↗	\neharpoonccw	⇀	\rightharpooncw*	↿	\upharpoonccw*
↗	\neharpooncw	⇌	\rightleftharpoons	↾	\upharpooncw*
⥢	\neswharpoonnwse	↘	\seharpoonccw		

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

Table 167: MnSymbol Negated Harpoons

$\ndownharpoonccw$	\ndownharpoonccw*	$\nneswharpoons$	\nneswharpoons	$\nseharpooncw$	\nseharpooncw
$\ndownharpooncw$	\ndownharpooncw*	$\nneswharpoonsenw$	\nneswharpoonsenw	$\nsenwharpoons$	\nsenwharpoons
$\ndownupharpoons$	\ndownupharpoons	$\nnwharpoonccw$	\nnwharpoonccw	$\nswharpoonccw$	\nswharpoonccw
$\nleftharpoonccw$	\nleftharpoonccw*	$\nnwharpooncw$	\nnwharpooncw	$\nswharpooncw$	\nswharpooncw
$\nleftharpooncw$	\nleftharpooncw*	$\nnwseharpoonnesw$	\nnwseharpoonnesw	$\nswneharpoons$	\nswneharpoons
$\nleftrightharpoondownup$	\nleftrightharpoondownup	$\nnwseharpoons$	\nnwseharpoons	$\nupdownharpoonleftright$	\nupdownharpoonleftright
$\nleftrightharpoons$	\nleftrightharpoons	$\nnwseharpoonswne$	\nnwseharpoonswne	$\nupdownharpoonrightleft$	\nupdownharpoonrightleft
$\nleftrightharpoonupdown$	\nleftrightharpoonupdown	$\nrightharpoonccw$	\nrightharpoonccw*	$\nupdownharpoons$	\nupdownharpoons
$\nneharpoonccw$	\nneharpoonccw	$\nrightharpooncw$	\nrightharpooncw*	$\nupharpoonccw$	\nupharpoonccw*
$\nneharpooncw$	\nneharpooncw	$\nrightleftharpoons$	\nrightleftharpoons	$\nupharpooncw$	\nupharpooncw*
$\nneswharpoonnwse$	\nneswharpoonnwse	$\nseharpoonccw$	\nseharpoonccw		

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

Table 168: fdsymbol Arrows

$\acwcirclearrowdown$	\acwcirclearrowdown	$\leftarrow$	\leftarrow	$\rightrightarrows$	\rightrightarrows
$\acwcirclearrowleft$	\acwcirclearrowleft	$\leftarrowtail$	\leftarrowtail	$\rightsquigarrow$	\rightwavearrow
$\acwcirclearrowright$	\acwcirclearrowright	$\leftbkarrow$	\leftbkarrow	$\Rrightarrow$	\Rrightarrow
$\acwcirclearrowup$	\acwcirclearrowup	$\leftleftarrows$	\leftleftarrows	$\Rsh$	\Rsh
$\acwleftarcarrow$	\acwleftarcarrow	$\leftmapsto$	\leftmapsto	$\searrow$	\searrow
$\acwnearcarrow$	\acwnearcarrow	$\Leftmapsto$	\Leftmapsto	$\Searrow$	\Searrow
$\acwnwarcarrow$	\acwnwarcarrow	$\Leftrightarrow$	\Leftrightarrow	$\searrowtail$	\searrowtail
$\acwoverarcarrow$	\acwoverarcarrow	$\leftrightarrow$	\leftrightarrow	$\sebkarrow$	\sebkarrow
$\acwrightarcarrow$	\acwrightarcarrow	$\leftrightarrows$	\leftrightarrows	$\senwarrows$	\senwarrows
$\acwsearcarrow$	\acwsearcarrow	$\leftrightsquigarrow$	\leftrightwavearrow	$\sesearrows$	\sesearrows
$\acwswarcarrow$	\acwswarcarrow	$\leftwavearrow$	\leftwavearrow	$\Swarrow$	\Swarrow
$\acwunderarcarrow$	\acwunderarcarrow	$\lightning$	\lightning	$\swarrow$	\swarrow
$\bdleftarcarrow$	\bdleftarcarrow	$\Lleftarrow$	\Lleftarrow	$\swarrowtail$	\swarrowtail
$\bdnearcarrow$	\bdnearcarrow	$\Longleftarrow$	\Longleftarrow	$\swbkarrow$	\swbkarrow
$\bdnwarcarrow$	\bdnwarcarrow	$\longleftarrow$	\longleftarrow	$\swnearrows$	\swnearrows
$\bdoverarcarrow$	\bdoverarcarrow	$\longleftrightarrow$	\longleftrightarrow	$\swswarrows$	\swswarrows
$\bdrightarcarrow$	\bdrightarcarrow	$\Longleftrightarrow$	\Longleftrightarrow	$\twoheaddownarrow$	\twoheaddownarrow
$\bdsearcarrow$	\bdsearcarrow	$\leftrightsquigarrow$	\longleftwavearrow	$\twoheadleftarrow$	\twoheadleftarrow
$\bdswarcarrow$	\bdswarcarrow	$\Longmapsfrom$	\Longmapsfrom	$\twoheadnearrow$	\twoheadnearrow
$\bdunderarcarrow$	\bdunderarcarrow	$\longmapsfrom$	\longmapsfrom	$\twoheadnwarrow$	\twoheadnwarrow
$\cwcirclearrowdown$	\cwcirclearrowdown	$\Longmapsto$	\Longmapsto	$\twoheadrightarrow$	\twoheadrightarrow
$\cwcirclearrowleft$	\cwcirclearrowleft	$\longmapsto$	\longmapsto	$\twoheadsearrow$	\twoheadsearrow

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↻	\cwcirclearrowright	⟶	\longrightarrow	↙	\twoheadswarrow
⟳	\cwcirclearrowup	⟹	\Longrightarrow	↟	\twoheaduparrow
↷	\cwleftarcarrow	⟿	\longrightwavearrow	↑	\uparrow
↘	\cwnearcarrow	↫	\looparrowleft	⇑	\Uparrow
↷	\cwnwarcarrow	↬	\looparrowright	↥	\uparrowtail
⤳	\cwoverarcarrow	↰	\Lsh	↾	\upbkarrow
↻	\cwrightarcarrow	↗	\nearrow	⇳	\Updownarrow
↻	\cwsearcarrow	⇗	\Nearrow	↕	\updownarrow
↶	\cwswarcarrow	↗	\nearrowtail	⇅	\updownarrows
∾	\cwunderarcarrow	↗	\nebkarrow	↕	\updownwavearrow
⤋	\Ddownarrow	↗	\nenearrows	↥	\upmapsto
⇓	\Downarrow	⇗	\Neswarrow	⇮	\Upmapsto
↓	\downarrow	⤢	\neswarrow	↑↑	\upuparrows
↧	\downarrowtail	⇗	\neswarrows	↾	\upwavearrow
↓	\downbkarrow	⇖	\Nwarrow	⤊	\Uuparrow
⇊	\downdownarrows	↖	\nwarrow	↭	\vardownwavearrow
⤇	\Downmapsto	↖	\nwarrowtail	↓	\varhookdownarrow
↧	\downmapsto	↖	\nwbkarrow	↼	\varhookleftarrow
⇵	\downuparrows	⇖	\nwnwarrows	↗	\varhooknearrow
↭	\downwavearrow	⇖	\Nwsearrow	↖	\varhooknwarrow
↧	\hookdownarrow	↘	\nwsearrow	↦	\varhookrightarrow
↩	\hookleftarrow	⇘	\nwsearrows	↘	\varhooksearrow
↗	\hooknearrow	↳	\Rdsh	↙	\varhookswarrow
↖	\hooknwarrow	⇒	\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:

↺	\acwgapcirclearrow	↭	\leftrightsquigarrow	↖	\rhooknwarrow
↺	\acwopencirclearrow	↜	\leftrsquigarrow	↦	\rhookrightarrow
↺	\circlearrowleft	↜	\leftsquigarrow	↘	\rhooksearrow
↻	\circlearrowright	↰	\leftupcurvedarrow	↙	\rhookswarrow
↶	\curvearrowleft	↧	\lhookdownarrow	↥	\rhookuparrow
↷	\curvearrowright	↼	\lhookleftarrow	⇝	\rightcurvedarrow
⟳	\cwgapcirclearrow	↗	\lhooknearrow	↳	\rightdowncurvedarrow
↻	\cwopencirclearrow	↖	\lhooknwarrow	⇁	\rightlcurvearrow
⇢	\dasharrow	↪	\lhookrightarrow	⇀	\rightleftcurvearrow
⇠	\dashleftarrow	↘	\lhooksearrow	⇄	\rightleftsquigarrow
⇢	\dashrightarrow	↙	\lhookswarrow	⇝	\rightlsquigarrow
↲	\downlcurvearrow	↥	\lhookuparrow	⇀	\rightrcurvearrow
↶	\downleftcurvedarrow	⟿	\longleadsto	⇝	\rightrsquigarrow

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⇂	\downlsquigarrow	⇜	\longleftsquigarrow	⇝	\rightsquigarrow
↶	\downrcurvearrow	⇝	\longrightsquigarrow	↱	\rightupcurvedarrow
⤵	\downrightcurvedarrow	↧	\mapsdown	⤵	\selcurvearrow
⇂	\downrsquigarrow	⇓	\Mapsdown	⤺	\senwcurvearrow
⤵	\downupcurvearrow	↤	\mapsfrom	⤷	\sercurvearrow
⇵	\downupsquigarrow	⇐	\Mapsfrom	↲	\swlcurvearrow
↯	\downzigzagarrow	↦	\mapsto	⤾	\swnecurvearrow
←	\gets	⇒	\Mapsto	↶	\swrcurvearrow
↗	\hknearrow	↥	\mapsup	→	\to
↖	\hknwarrow	⇑	\Mapsup	↷	\updowncurvearrow
↘	\hksearrow	↷	\nelcurvearrow	↕	\updownsquigarrow
↙	\hkswarrow	↷	\nercurvearrow	↷	\uplcurvearrow
⇝	\leadsto	⤾	\neswcurvearrow	↰	\upleftcurvedarrow
↶	\leftcurvedarrow	↰	\nwlcurvearrow	↾	\uplsquigarrow
↶	\leftdowncurvedarrow	↰	\nwrcurvearrow	↿	\uprcurvearrow
↜	\leftlcurvearrow	↰	\nwsecurvearrow	↑	\uprightcurvearrow
↜	\leftlsquigarrow	↧	\rhookdownarrow	↾	\uprsquigarrow
↶	\leftrcurvearrow	↩	\rhookleftarrow		
↭	\leftrightcurvearrow	↗	\rhooknearrow		

Table 169: fdsymbol Negated Arrows

🛇	\nacwcirclearrowdown	↚	\nleftarrow	⇏	\nRrightarrow
🛇	\nacwcirclearrowleft	⇍	\nLeftarrow	↘	\nsearrow
🛇	\nacwcirclearrowright	↚	\nleftarrowtail	⤡	\nSearrow
🛇	\nacwcirclearrowup	↚	\nleftbkarrow	⤡	\nsearrowtail
↯	\nacwleftarcarrow	⇇	\nleftleftarrows	↘	\nsebkarrow
↯	\nacwnearcarrow	↚	\nleftmapsto	⤡	\nsenwarrows
↯	\nacwnwarcarrow	⇍	\nLeftmapsto	⤡	\nsesearrows
↯	\nacwoverarcarrow	↚	\nleftrightarrow	↙	\nswarrow
↯	\nacwrightarcarrow	⇎	\nLeftrightarrow	⤢	\nSwarrow
↯	\nacwsearcarrow	↭	\nleftrightarrows	↙	\nswarrowtail
↯	\nacwswarcarrow	↚	\nleftrightwavearrow	↙	\nswbkarrow
↯	\nacwunderarcarrow	↚	\nleftwavearrow	⤢	\nswnearrows
↯	\nbdleftarcarrow	⇍	\nLleftarrow	⤢	\nswswarrows
↯	\nbdnearcarrow	⟵	\nlongleftarrow	↡	\ntwoheaddownarrow
↯	\nbdnwarcarrow	⟸	\nLongleftarrow	↞	\ntwoheadleftarrow
↯	\nbdoverarcarrow	⟷	\nlongleftrightarrow	↗	\ntwoheadnearrow
↯	\nbdrightarcarrow	⟺	\nLongleftrightarrow	↖	\ntwoheadnwarrow

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⤲	\nbdsearcarrow	↭	\nlongleftwavearrow	↛	\ntwoheadrightarrow
⤳	\nbdswarcarrow	⟻	\nlongmapsfrom	⤳	\ntwoheadsearrow
⥷	\nbdunderarcarrow	⟽	\nLongmapsfrom	⤶	\ntwoheadswarrow
⟳	\ncwcirclearrowdown	⟼	\nlongmapsto	↟	\ntwoheaduparrow
⟲	\ncwcirclearrowleft	⟾	\nLongmapsto	↑	\nuparrow
⟲	\ncwcirclearrowright	⟶	\nlongrightarrow	⇮	\nUparrow
⟳	\ncwcirclearrowup	⟹	\nLongrightarrow	↟	\nuparrowtail
↜	\ncwleftarcarrow	↝	\nlongrightwavearrow	⇡	\nupbkarrow
↷	\ncwnearcarrow	↗	\nnearrow	↕	\nupdownarrow
↶	\ncwnwarcarrow	⇗	\nNearrow	⇕	\nUpdownarrow
⤾	\ncwoverarcarrow	↗	\nnearrowtail	↭	\nupdownarrows
↴	\ncwrightarcarrow	↗	\nnebkarrow	↭	\nupdownwavearrow
↴	\ncwsearcarrow	⇗	\nnenearrows	↥	\nupmapsto
↶	\ncwswarcarrow	↙	\nneswarrow	⇞	\nUpmapsto
⤿	\ncwunderarcarrow	⇙	\nNeswarrow	⇈	\nupuparrows
⇊	\nDdownarrow	⇗	\nneswarrows	↝	\nupwavearrow
↓	\ndownarrow	↖	\nnwarrow	⇞	\nUuparrow
⇓	\nDownarrow	⇖	\nNwarrow	↯	\nvardownwavearrow
↡	\ndownarrowtail	↖	\nnwarrowtail	↧	\nvarhookdownarrow
⇂	\ndownbkarrow	↖	\nnwbkarrow	↫	\nvarhookleftarrow
⇵	\ndowndownarrows	⇖	\nnwnwarrows	↗	\nvarhooknearrow
↧	\ndownmapsto	↘	\nnwsearrow	↖	\nvarhooknwarrow
⇟	\nDownmapsto	⇘	\nNwsearrow	↬	\nvarhookrightarrow
⇵	\ndownuparrows	⇘	\nnwsearrows	↘	\nvarhooksearrow
↭	\ndownwavearrow	↛	\nrightarrow	↙	\nvarhookswarrow
↧	\nhookdownarrow	⇏	\nRightarrow	↥	\nvarhookuparrow
↫	\nhookleftarrow	↣	\nrightarrowtail	↭	\nvarleftrightwavearrow
↗	\nhooknearrow	⇢	\nrightbkarrow	↜	\nvarleftwavearrow
↖	\nhooknwarrow	⇄	\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	↚	\nleftrcurvearrow	↛	\nrightleftcurvearrow
↚	\ncurvearrowleft	↚	\nleftrightcurvearrow	↮	\nrightleftsquigarrow
↛	\ncurvearrowright	↮	\nleftrightsquigarrow	↛	\nrightlsquigarrow
⟳	\ncwgapcirclearrow	↜	\nleftrsquigarrow	↛	\nrightrcurvearrow
⟲	\ncwopencirclearrow	↜	\nleftsquigarrow	↛	\nrightrsquigarrow
⇢	\ndasharrow	↖	\nleftupcurvedarrow	↛	\nrightsquigarrow

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↚	\ndashleftarrow	⇝	\nlongleadsto	↱	\nrightupcurvedarrow
⇢	\ndashrightarrow	⇜	\nlongleftsquigarrow	↘	\nselcurvearrow
↲	\ndownlcurvearrow	⇝	\nlongrightsquigarrow	↖	\nsenwcurvearrow
↙	\ndownleftcurvedarrow	↧	\nmapsdown	↳	\nsercurvearrow
⇣	\ndownlsquigarrow	⇟	\nMapsdown	↙	\nswlcurvearrow
↳	\ndownrcurvearrow	↤	\nmapsfrom	↗	\nswnecurvearrow
↘	\ndownrightcurvedarrow	⇍	\nMapsfrom	↙	\nswrcurvearrow
⇢	\ndownrsquigarrow	↦	\nmapsto	↛	\nto
↴	\ndownupcurvearrow	⇏	\nMapsto	↰	\nupdowncurvearrow
⇵	\ndownupsquigarrow	↥	\nmapsup	⇕	\nupdownsquigarrow
↚	\ngets	⇑	\nMapsup	↱	\nuplcurvearrow
↗	\nhknearrow	↗	\nnelcurvearrow	↰	\nupleftcurvedarrow
↖	\nhknwarrow	↗	\nnercurvearrow	⇡	\nuplsquigarrow
↘	\nhksearrow	↗	\nneswcurvearrow	↱	\nuprcurvearrow
↙	\nhkswarrow	↰	\nnwlcurvearrow	↗	\nuprightcurvearrow
↛	\nleadsto	↖	\nnwrcurvearrow	⇡	\nuprsquigarrow
↚	\nleftcurvedarrow	↖	\nnwsecurvearrow		

Table 170: fdsymbol Harpoons

↓	\downharpoonleft	⇙	\neswharpoons	↘	\seharpoonsw
↓	\downharpoonright	↙	\neswharpoonsenw	⇘	\senwharpoons
⇃	\downupharpoons	↖	\nwharpoonne	↙	\swharpoonnw
↼	\leftharpoondown	↖	\nwharpoonsw	↙	\swharpoonse
↼	\leftharpoonup	↖	\nwseharpoonnesw	⇙	\swneharpoons
⇆	\leftrightharpoondownup	⇖	\nwseharpoons	↕	\updownharpoonleftright
⇋	\leftrightharpoons	↖	\nwseharpoonswne	↕	\updownharpoonrightleft
↽	\leftrightharpoonupdown	⇀	\rightharpoondown	⇅	\updownharpoons
↗	\neharpoonnw	⇀	\rightharpoonup	↑	\upharpoonleft
↗	\neharpoonse	⇌	\rightleftharpoons	↑	\upharpoonright
↙	\neswharpoonnwse	↘	\seharpoonne		

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

Table 171: fdsymbol Negated Harpoons

⇂	\ndownharpoonleft	⇗	\nneswharpoons	⇘	\nseharpoonsw
⇃	\ndownharpoonright	⇗	\nneswharpoonsenw	⇖	\nsenwharpoons
⇵	\ndownupharpoons	⇖	\nnwharpoonne	⇙	\nswharpoonnw
⇽	\nleftharpoondown	⇖	\nnwharpoonsw	⇙	\nswharpoonse
⇼	\nleftharpoonup	⇘	\nnwseharpoonnesw	⇗	\nswneharpoons
⇿	\nleftrightharpoondownup	⇗	\nnwseharpoons	⇂	\nupdownharpoonleftright
⇿	\nleftrightharpoons	⇘	\nnwseharpoonswne	⇂	\nupdownharpoonrightleft
⇿	\nleftrightharpoonupdown	⇀	\nrightharpoondown	⇅	\nupdownharpoons
⇀	\nneharpoonnw	⇀	\nrightharpoonup	⇂	\nupharpoonleft
⇀	\nneharpoonse	⇄	\nrightleftharpoons	⇂	\nupharpoonright
⇗	\nneswharpoonnwse	⇘	\nseharpoonne		

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

Table 172: boisik Arrows

⇤	\barleftarrow	↰	\Lsh
⇆	\barleftarrowrightarrowbar	↧	\mapsdown
↖	\barovernorthwestarrow	⇦	\Mapsfrom
↵	\carriagereturn	↤	\mapsfrom
↺	\circlearrowleft	⇨	\Mapsto
↻	\circlearrowright	↦	\mapsto
⊎	\cupleftarrow	↥	\mapsup
⇙	\curlyveedownarrow	⇗	\Nearrow
⇘	\curlyveeuparrow	⇘	\nearrowcorner
⇙	\curlywedgedownarrow	↗	\nnearrow
⇗	\curlywedgeuparrow	↖	\nnwarrow
↶	\curvearrowbotleft	⇖	\Nwarrow
↶	\curvearrowbotleftright	⇖	\nwarrowcorner
↷	\curvearrowbotright	⇥	\rightarrowbar
↶	\curvearrowleft	⇸	\rightarrowcircle
↶	\curvearrowleftright	↣	\rightarrowtail
↷	\curvearrowright	⇢	\rightarrowTriangle
↲	\dlsh	⇢	\rightarrowtriangle
⬇	\downblackarrow	➡	\rightblackarrow
⇣	\downdasharrow	⇢	\rightdasharrow
⇊	\downdownarrows	⇄	\rightleftarrows
⇩	\downtouparrow	⇉	\rightrightarrows
⇩	\downwhitearrow	⇝	\rightsquigarrow

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↯	\downzigzagarrow	⇉	\rightthreearrows
↳	\drsh	⇜	\righttoleftarrow
⇿	\eqleftrightarrow	⇨	\rightwhitearrow
↩	\hookleftarrow	⇨	\rightwhiteroundarrow
↪	\hookrightarrow	⇛	\Rrightarrow
↢	\leftarrowtail	↱	\Rsh
←	\leftarrowTriangle	⇘	\Searrow
←	\leftarrowtriangle	↘	\ssearrow
⬅	\leftblackarrow	↙	\sswarrow
⇠	\leftdasharrow	⇙	\Swarrow
⇇	\leftleftarrows	↡	\twoheaddownarrow
⇆	\leftrightarroweq	↞	\twoheadleftarrow
⇆	\leftrightarrows	↠	\twoheadrightarrow
↔	\leftrightarrowTriangle	↟	\twoheaduparrow
↔	\leftrightarrowtriangle	⇮	\twoheadwhiteuparrow
⬌	\leftrightblackarrow	⇮	\twoheadwhiteuparrowpedestal
↜	\leftrightsquigarrow	⬆	\upblackarrow
↜	\leftsquigarrow	⇡	\updasharrow
↬	\lefttorightarrow	↕	\updownarrowbar
⇦	\leftwhitearrow	⬍	\updownblackarrow
⇦	\leftwhiteroundarrow	⇳	\updownwhitearrow
↜	\leftzigzagarrow	↶	\uptodownarrow
↴	\linefeed	↑↑	\upuparrows
⇚	\Lleftarrow	⇧	\upwhitearrow
↫	\looparrowdownleft	⇪	\whitearrowupfrombar
↬	\looparrowdownright	⇮	\whitearrowuppedestal
↫	\looparrowleft	⇮	\whitearrowuppedestalhbar
↬	\looparrowright	⇮	\whitearrowuppedestalvbar

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

Table 173: boisik Negated Arrows

⇟	\nHdownarrow	⇎	\nLeftrightarroW	⇏	\nRightarrow
⇞	\nHuparrow	↮	\nleftrightarrow	⇷	\nVleftarrow
⇍	\nLeftarrow	⇎	\nLeftrightarrow	⇸	\nVrightarrow
↚	\nleftarrow	↛	\nrightarrow		

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

Table 174: boisik Harpoons

⇃	\downharpoonleft	⇋	\leftrightharpoons	↿	\upharpoonleft
⇂	\downharpoonright	⇁	\rightharpoondown	↾	\upharpoonright
↼	\leftharpoondown	⇀	\rightharpoonup		
↼	\leftharpoonup	⇌	\rightleftharpoons		

Table 175: stix Arrows

↻	\acwcirclearrow	⟼	\longmapsto
↺	\acwgapcirclearrow	⟾	\Longmapsto
↶	\acwleftarcarrow	⟶	\longrightarrow
↶	\acwoverarcarrow	⟹	\Longrightarrow
↷	\acwunderarcarrow	⟿	\longrightsquigarrow
⇤	\barleftarrow	↫	\looparrowleft
⇆	\barleftarrowrightarrowbar*	↬	\looparrowright
⇸	\barrightarrowdiamond	↰	\Lsh
↑	\baruparrow	↧	\mapsdown
⇜	\bsimilarleftarrow	⇚	\Mapsfrom
⇝	\bsimilarrightarrow	↤	\mapsfrom
↵	\carriagereturn*	↦	\mapsto
↷	\ccwundercurvearrow	⇨	\Mapsto
↺	\circlearrowleft	↥	\mapsup
↻	\circlearrowright	⇗	\Nearrow
⇷	\circleonleftarrow	↗	\nearrow
⇸	\circleonrightarrow	⤫	\neovnwarrow*
↶	\curvearrowleft	⤭	\neovsearrow*
↶	\curvearrowleftplus	↙	\neswarrow
↷	\curvearrowright	↖	\nwarrow
↷	\curvearrowrightminus	⇖	\Nwarrow
↻	\cwcirclearrow	⤬	\nwovnearrow*
↻	\cwgapcirclearrow	⤡	\nwsearrow
↷	\cwrightarcarrow	⤮	\rdiagovsearrow*
↷	\cwundercurvearrow	↳	\Rdsh
⇢	\dbkarow	⇒	\Rightarrow
⟱	\DDownarrow	→	\rightarrow
⇓	\Ddownarrow	⥲	\rightarrowapprox
⇠	\diamondleftarrow	⥳	\rightarrowbackapprox
⇤	\diamondleftarrowbar	⇥	\rightarrowbar
↓	\downarrow	⥴	\rightarrowbsimilar
⇓	\Downarrow	⇢	\rightarrowdiamond
↧	\downarrowbar	⟴	\rightarrowonoplus

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↡	\downarrowbarred	⇄	\rightarrowplus
⇣	\downdasharrow*	⇄	\rightarrowshortleftarrow
⇊	\downdownarrows	⇄	\rightarrowsimilar
⇂	\downrightcurvedarrow*	⇀	\rightarrowtail
⇵	\downuparrows	⇀	\rightarrowtriangle
⇩	\downwhitearrow*	⇻	\rightarrowx
↯	\downzigzagarrow	⇢	\rightbkarrow
➔	\draftingarrow*	⇝	\rightcurvedarrow
⤞	\drbkarow	⇢	\rightdasharrow*
⇐	\equalleftarrow	⇢	\rightdotarrow
⇒	\equalrightarrow	⇂	\rightdowncurvedarrow
⇗	\fdiagovnearrow*	⇄	\rightleftarrows
↗	\hknearrow	⇉	\rightrightarrows
↖	\hknwarrow	⇝	\rightsquigarrow
↘	\hksearow	⇉	\rightthreearrows
↙	\hkswarow	⇝	\rightwavearrow
↩	\hookleftarrow	⇨	\rightwhitearrow*
↪	\hookrightarrow	⇛	\RRightarrow
↲	\Ldsh	⇛	\Rrightarrow
←	\leftarrow	↱	\Rsh
⇐	\Leftarrow	↘	\searrow
⇜	\leftarrowapprox	⇘	\Searrow
⇜	\leftarrowbackapprox	⇗	\seovnearrow*
⇜	\leftarrowbsimilar	⇄	\shortrightarrowleftarrow
⊖	\leftarrowonoplus	⇜	\similarleftarrow
⇜	\leftarrowplus	⇝	\similarrightarrow
⇆	\leftarrowshortrightarrow	↙	\swarrow
⇜	\leftarrowsimilar	⇙	\Swarrow
↢	\leftarrowtail	⇗	\toea
←	\leftarrowtriangle	⇖	\tona
⇷	\leftarrowx	⇘	\tosa
⇠	\leftbkarrow	⇙	\towa
↶	\leftcurvedarrow	↡	\twoheaddownarrow
⇠	\leftdasharrow*	↞	\twoheadleftarrow
⇠	\leftdbkarrow	↢	\twoheadleftarrowtail
⇠	\leftdotarrow	⇠	\twoheadleftdbkarrow
↲	\leftdowncurvedarrow	↤	\twoheadmapsfrom
⇇	\leftleftarrows	↦	\twoheadmapsto
⇔	\Leftrightarrow	↠	\twoheadrightarrow
↔	\leftrightarrow	↣	\twoheadrightarrowtail
⇿	\leftrightarrowcircle	↟	\twoheaduparrow
⇆	\leftrightarrows	↟	\twoheaduparrowcircle
↭	\leftrightarrowtriangle	↑	\uparrow
↭	\leftrightsquigarrow	⇑	\Uparrow
↜	\leftsquigarrow	↑	\uparrowbarred
⇇	\leftthreearrows	⇡	\updasharrow*

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⬿	\leftwavearrow	⇳	\Updownarrow
⇦	\leftwhitearrow*	↕	\updownarrow
↴	\linefeed*	↨	\updownarrowbar*
⪋	\LLeftarrow	⇅	\updownarrows
⪋	\Lleftarrow	⤴	\uprightcurvearrow*
⟵	\longleftarrow	⇈	\upuparrows
⟸	\Longleftarrow	⇧	\upwhitearrow*
⟺	\Longleftrightarrow	⟰	\UUparrow
⟷	\longleftrightarrow	⟰	\Uuparrow
⬳	\longleftsquigarrow	↵	\varcarriagereturn*
⟽	\Longmapsfrom	⇪	\whitearrowupfrombar*
⟻	\longmapsfrom		

* 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 176: 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		

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

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

Table 177: 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*
⥧	\leftrightharpoondowndown	⥖	\upharpoonrightbar
⥥	\leftrightharpoondownup	⥮	\upharpoonsleftright

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

Table 178: pdfMsym Arrows

↯	\lightning		
⟸	\longvarCircleleftarrow	⇦	\varCircleleftarrow
⟵	\longvarcircleleftarrow	⇦	\varcircleleftarrow
⟹	\longvarCirclerightarrow	⇨	\varCirclerightarrow
⟶	\longvarcirclerightarrow	⇨	\varcirclerightarrow
⇇	\longvardoubleleftarrow	⇇	\vardoubleleftarrow
⇉	\longvardoublerightarrow	⇉	\vardoublerightarrow
⟻	\longvardownhookleftarrow	↩	\vardownhookleftarrow

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⟼	\longvardownhookrightarrow	↪	\vardownhookrightarrow
⟸	\longvarLeftarrow	⇐	\varLeftarrow
⟵	\longvarleftarrow	←	\varleftarrow
⇇	\longvarleftarrows	⇇	\varleftarrows
⟷	\longvarleftrightarrow	↔	\varleftrightarrow
⇆	\longvarleftrightarrows	⇆	\varleftrightarrows
⟸	\longvarLleftarrow	⇚	\varLleftarrow
⟺	\longvarLleftRrightarrow	⇔	\varLleftRrightarrow
⟻	\longvarmapsfrom	↤	\varmapsfrom
⟼	\longvarmapsto	↦	\varmapsto
⟸	\longvarRibbonleftarrow	⇐	\varRibbonleftarrow
⟹	\longvarRibbonrightarrow	⇒	\varRibbonrightarrow
⟹	\longvarRightarrow	⇒	\varRightarrow
⟶	\longvarrightarrow	→	\varrightarrow
⇉	\longvarrightarrows	⇉	\varrightarrows
⇄	\longvarrightleftarrows	⇄	\varrightleftarrows
⟹	\longvarRrightarrow	⇛	\varRrightarrow
⟸	\longvarSquareleftarrow	⇦	\varSquareleftarrow
⟹	\longvarSquarerightarrow	⇨	\varSquarerightarrow
⟻	\longvaruphookleftarrow	↩	\varuphookleftarrow
⟼	\longvaruphookrightarrow	↪	\varuphookrightarrow

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

Table 179: pdfMsym Harpoons

⟝	\longvarleftharp	↼	\varleftharp
⟛	\longvarleftrightharp	⇀	\varleftrightharp
⟞	\longvarrightharp	⇀	\varrightharp
⟛	\longvarrightleftharp	⇀	\varrightleftharp

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

Table 180: chemarrow Arrows

→	\chemarrow

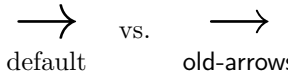
Table 181: fge Arrows

⇻	\fgerightarrow	⇞	\fgeuparrow

Table 182: old-arrows Arrows

↓	\downarrow	⟷	\longleftrightarrow	↖	\nwarrow
↩	\hookleftarrow	⟻	\longmapsfrom*	→	\rightarrow
↪	\hookrightarrow	⟼	\longmapsto	↘	\searrow
←	\leftarrow	⟶	\longrightarrow	↙	\swarrow
↔	\leftrightarrow	↤	\mapsfrom*	↑	\uparrow
⟹	\longhookrightarrow	↦	\mapsto	↕	\updownarrow
⟵	\longleftarrow	↗	\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 $\mathcal{AMS}$'s \overleftarrow, \overrightarrow, \overleftrightarrow, \underleftarrow, \underrightarrow, \underleftrightarrow, \xleftarrow, \xrightarrow, \varinjlim, and \varprojlim symbols (Table 204 on page 119, Table 270 on page 139, and Table 288 on page 145) and mathtools's \xleftrightarrow, \xhookleftarrow, \xhookrightarrow, and \xmapsto symbols (Table 289 on page 145).

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

* Requires stmaryrd.

Table 183: old-arrows Harpoons

⟝	\longleftharpoondown	⟞	\longrightharpoondown
⟵	\longleftharpoonup	⟶	\longrightharpoonup

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

Table 184: logix Arrows

$\dashleftarrow$	\DashArrowLeft	$\Rightarrow$	\LMtImpl	$\leftrightarrow$	\RplcFree
$\dashrightarrow$	\DashArrowRight	$\leftarrow\!\!\circ$	\LoopArrowLeft	$\leftarrow$	\RplcFreeLeft
$\rightarrow$	\Entail	$\circ\!\!\rightarrow$	\LoopArrowRight	$\rightarrow$	\RplcFreeRight
$\leftrightarrow$	\EntailEquv	$\nrightarrow$	\LParFunc	$\rightarrow$	\SEntail
$\leftrightarrow$	\Equv	$\rightarrow$	\LWkEntail	$\leftrightarrow$	\SEntailEquv
$\ll\!\!\prec$	\FishArrowLeft	$\leftrightarrow$	\LWkEntailEquv	$\leftrightarrow$	\SEquv
$\succ\!\!\gg$	\FishArrowRight	$\overset{+}{\rightarrow}$	\MapParInGndMul	$\rightarrow$	\SFunc
$\vdash\!\!\!-$	\FlatArrowLeft	$\overset{:}{\rightarrow}$	\MapParInGndOne	$\updownarrow$	\ShftAccent
$-\!\!\!\dashv$	\FlatArrowRight	$\underset{\smile}{\rightarrow}$	\MapParInGndSng	$\downarrow$	\ShftSubscr
$\leftarrow\!\!=$	\ForkArrowLeft	$\overset{+}{\rightarrow}$	\MapParInMul	$\uparrow$	\ShftSuper
$=\!\!\rightarrow$	\ForkArrowRight	$\overset{\cdot}{\rightarrow}$	\MapParInOne	$\rightarrow$	\SImpl
$\rightarrow$	\Func	$\rightarrow$	\MapParInSng	$\mapsto$	\SMapTo
$\overset{+}{\underset{\smile}{\mapsto}}$	\FunParInGndMul	$\overset{+}{\rightarrow}$	\MapParOnGndMul	$\Leftrightarrow$	\SMtEquv
$\overset{:}{\underset{\smile}{\mapsto}}$	\FunParInGndOne	$\overset{:}{\rightarrow}$	\MapParOnGndOne	$\Rightarrow$	\SMtImpl
$\underset{\smile}{\mapsto}$	\FunParInGndSng	$\underset{\smile}{\rightarrow}$	\MapParOnGndSng	$\nrightarrow$	\SParFunc
$\overset{+}{\mapsto}$	\FunParInMul	$\overset{+}{\rightarrow}$	\MapParOnMul	$\rightarrow$	\SWkEntail
$\overset{\cdot}{\mapsto}$	\FunParInOne	$\overset{\cdot}{\rightarrow}$	\MapParOnOne	$\leftrightarrow$	\SWkEntailEquv
$\mapsto$	\FunParInSng	$\rightarrow$	\MapParOnSng	$\longrightarrow$	\VEntail
$\overset{+}{\underset{\smile}{\mapsto}}$	\FunParOnGndMul	$\mapsto$	\MapTo	$\longleftrightarrow$	\VEntailEquv
$\overset{:}{\underset{\smile}{\mapsto}}$	\FunParOnGndOne	$\overset{+}{\rightarrow}$	\MapTotInGndMul	$\longleftrightarrow$	\VEquv
$\underset{\smile}{\mapsto}$	\FunParOnGndSng	$\overset{:}{\rightarrow}$	\MapTotInGndOne	$\longrightarrow$	\VFunc
$\overset{+}{\mapsto}$	\FunParOnMul	$\underset{\smile}{\rightarrow}$	\MapTotInGndSng	$\longrightarrow$	\VImpl
$\overset{\cdot}{\mapsto}$	\FunParOnOne	$\overset{+}{\rightarrow}$	\MapTotInMul	$\longmapsto$	\VMapTo
$\mapsto$	\FunParOnSng	$\overset{\cdot}{\rightarrow}$	\MapTotInOne	$\Longleftrightarrow$	\VMtEquv
$\overset{+}{\underset{\smile}{\mapsto}}$	\FunTotInGndMul	$\rightarrow$	\MapTotInSng	$\Longrightarrow$	\VMtImpl
$\overset{:}{\underset{\smile}{\mapsto}}$	\FunTotInGndOne	$\overset{+}{\rightarrow}$	\MapTotOnGndMul	$\longrightarrow\!\!\!\!\rightarrow$	\VParFunc
$\underset{\smile}{\mapsto}$	\FunTotInGndSng	$\overset{:}{\rightarrow}$	\MapTotOnGndOne	$\longrightarrow$	\VWkEntail
$\overset{+}{\mapsto}$	\FunTotInMul	$\underset{\smile}{\rightarrow}$	\MapTotOnGndSng	$\longleftrightarrow$	\VWkEntailEquv
$\overset{\cdot}{\mapsto}$	\FunTotInOne	$\overset{+}{\rightarrow}$	\MapTotOnMul	$\rightsquigarrow$	\WavyArrowLeft
$\mapsto$	\FunTotInSng	$\overset{\cdot}{\rightarrow}$	\MapTotOnOne	$\rightsquigarrow$	\WavyArrowRight
$\overset{+}{\underset{\smile}{\mapsto}}$	\FunTotOnGndMul	$\rightarrow$	\MapTotOnSng	$\rightarrow$	\WkEntail
$\overset{:}{\underset{\smile}{\mapsto}}$	\FunTotOnGndOne	$\Longleftrightarrow$	\MtEquv	$\leftrightarrow$	\WkEntailEquv
$\underset{\smile}{\mapsto}$	\FunTotOnGndSng	$\Rightarrow$	\MtImpl	$\longrightarrow$	\XEntail
$\overset{+}{\mapsto}$	\FunTotOnMul	$\nrightarrow$	\ParFunc	$\longleftrightarrow$	\XEntailEquv
$\overset{\cdot}{\mapsto}$	\FunTotOnOne	$\leftrightarrow$	\RplcAll	$\longleftrightarrow$	\XEquv
$\mapsto$	\FunTotOnSng	$\leftrightarrow$	\RplcAllBnd	$\longrightarrow$	\XFunc
$\hookleftarrow$	\HookArrowLeft	$\leftarrow$	\RplcAllBndLeft	$\longrightarrow$	\XImpl
$\hookrightarrow$	\HookArrowRight	$\rightarrow$	\RplcAllBndRight	$\longmapsto$	\XMapTo
$\rightarrow$	\Impl	$\leftarrow$	\RplcAllLeft	$\Longleftrightarrow$	\XMtEquv
$\rightarrow$	\LEntail	$\rightarrow$	\RplcAllRight	$\Longrightarrow$	\XMtImpl
$\leftrightarrow$	\LEntailEquv	$\leftrightarrow$	\RplcAny	$\nrightarrow$	\XParFunc
$\leftrightarrow$	\LEquv	$\leftarrow$	\RplcAnyLeft	$\longrightarrow$	\XWkEntail
$\rightarrow$	\LFunc	$\rightarrow$	\RplcAnyRight	$\leftrightarrow$	\XWkEntailEquv

(continued on next page)

(continued from previous page)

$\longrightarrow$	`\LImpl`	$\leftrightarrow$	`\RplcEquv`	$\leftsquigarrow$	`\ZigArrowLeft`
$\longmapsto$	`\LMapTo`	$\leftarrow$	`\RplcEquvLeft`	$\rightsquigarrow$	`\ZigArrowRight`
$\Longleftrightarrow$	`\LMtEquv`	$\rightarrow$	`\RplcEquvRight`		

logix requires either LuaLaTeX or XeLaTeX.

Table 185: logix Negated Arrows

$\not\rightarrow$	`\NotEntail`	$\not\rightarrow$	`\NotSEntail`	$\not\rightarrow$	`\NotVWkEntail`
$\not\leftrightarrow$	`\NotEntailEquv`	$\not\leftrightarrow$	`\NotSEntailEquv`	$\not\leftrightarrow$	`\NotVWkEntailEquv`
$\not\leftrightarrow$	`\NotEquv`	$\not\leftrightarrow$	`\NotSEquv`	$\not\rightarrow$	`\NotWkEntail`
$\not\rightarrow$	`\NotImpl`	$\not\rightarrow$	`\NotSImpl`	$\not\leftrightarrow$	`\NotWkEntailEquv`
$\not\rightarrow$	`\NotLEntail`	$\not\Rightarrow$	`\NotSMtEquv`	$\not\rightarrow$	`\NotXEntail`
$\not\leftrightarrow$	`\NotLEntailEquv`	$\not\Rightarrow$	`\NotSMtImpl`	$\not\leftrightarrow$	`\NotXEntailEquv`
$\not\leftrightarrow$	`\NotLEquv`	$\not\rightarrow$	`\NotSWkEntail`	$\not\leftrightarrow$	`\NotXEquv`
$\not\rightarrow$	`\NotLImpl`	$\not\leftrightarrow$	`\NotSWkEntailEquv`	$\not\rightarrow$	`\NotXImpl`
$\not\Longleftrightarrow$	`\NotLMtEquv`	$\not\rightarrow$	`\NotVEntail`	$\not\Longleftrightarrow$	`\NotXMtEquv`
$\not\Rightarrow$	`\NotLMtImpl`	$\not\leftrightarrow$	`\NotVEntailEquv`	$\not\Rightarrow$	`\NotXMtImpl`
$\not\rightarrow$	`\NotLWkEntail`	$\not\leftrightarrow$	`\NotVEquv`	$\not\rightarrow$	`\NotXWkEntail`
$\not\leftrightarrow$	`\NotLWkEntailEquv`	$\not\rightarrow$	`\NotVImpl`	$\not\leftrightarrow$	`\NotXWkEntailEquv`
$\not\Longleftrightarrow$	`\NotMtEquv`	$\not\Longleftrightarrow$	`\NotVMtEquv`		
$\not\Rightarrow$	`\NotMtImpl`	$\not\Rightarrow$	`\NotVMtImpl`		

logix requires either LuaLaTeX or XeLaTeX.

Table 186: logix Harpoons

$\leftharpoonup$	`\HarpoonDnLeft`	$\leftharpoonup$	`\HarpoonUpLeft`
$\rightharpoonup$	`\HarpoonDnRight`	$\rightharpoonup$	`\HarpoonUpRight`

logix requires either LuaLaTeX or XeLaTeX.

Table 187: logix Implications and Equivalences

$\in\!\!\!\!-\!\!\!\!\supset$	`\InEquv`	$\in\!\!\!\!-\!\!\!\!\supset$	`\SInEquv`	$\longleftrightarrow\!\!\!\!\supset$	`\VWkEquv`	$\in\!\!\!\!-\!\!\!\!\supset$	`\XInEquv`
$-\!\!\!\!\supset$	`\InImpl`	$-\!\!\!\!\supset$	`\SInImpl`	$\longrightarrow\!\!\!\!\supset$	`\VWkImpl`	$-\!\!\!\!\supset$	`\XInImpl`
$\in\!\!\!\!-\!\!\!\!\supset$	`\LInEquv`	$\leftrightarrow\!\!\!\!\supset$	`\SWkEquv`	$\Longleftrightarrow\!\!\!\!\supset$	`\VWkMtEquv`	$\leftrightarrow\!\!\!\!\supset$	`\XWkEquv`
$-\!\!\!\!\supset$	`\LInImpl`	$\rightarrow\!\!\!\!\supset$	`\SWkImpl`	$\Longrightarrow\!\!\!\!\supset$	`\VWkMtImpl`	$\longrightarrow\!\!\!\!\supset$	`\XWkImpl`
$\leftrightarrow\!\!\!\!\supset$	`\LWkEquv`	$\Leftrightarrow\!\!\!\!\supset$	`\SWkMtEquv`	$\leftrightarrow\!\!\!\!\supset$	`\WkEquv`	$\Longleftrightarrow\!\!\!\!\supset$	`\XWkMtEquv`
$\longrightarrow\!\!\!\!\supset$	`\LWkImpl`	$\Rightarrow\!\!\!\!\supset$	`\SWkMtImpl`	$\longrightarrow\!\!\!\!\supset$	`\WkImpl`	$\Longrightarrow\!\!\!\!\supset$	`\XWkMtImpl`
$\Longleftrightarrow\!\!\!\!\supset$	`\LWkMtEquv`	$\in\!\!\!\!-\!\!\!\!\supset$	`\VInEquv`	$\Leftrightarrow\!\!\!\!\supset$	`\WkMtEquv`		
$\Longrightarrow\!\!\!\!\supset$	`\LWkMtImpl`	$-\!\!\!\!\supset$	`\VInImpl`	$\Rightarrow\!\!\!\!\supset$	`\WkMtImpl`		

logix requires either LuaLaTeX or XeLaTeX.

Table 188: logix Negated Implications and Equivalences

$\not\in$	\NotInEquv	$\not\ni$	\NotSWkEquv	$\not\ni$	\NotWkEquv
$\not\Leftarrow$	\NotInImpl	$\not\Rightarrow$	\NotSWkImpl	$\not\Rightarrow$	\NotWkImpl
$\not\in$	\NotLInEquv	$\not\ni$	\NotSWkMtEquv	$\not\ni$	\NotWkMtEquv
$\not\Leftarrow$	\NotLInImpl	$\not\Rightarrow$	\NotSWkMtImpl	$\not\Rightarrow$	\NotWkMtImpl
$\not\ni$	\NotLWkEquv	$\not\in$	\NotVInEquv	$\not\in$	\NotXInEquv
$\not\Rightarrow$	\NotLWkImpl	$\not\Leftarrow$	\NotVInImpl	$\not\Leftarrow$	\NotXInImpl
$\not\ni$	\NotLWkMtEquv	$\not\ni$	\NotVWkEquv	$\not\ni$	\NotXWkEquv
$\not\Rightarrow$	\NotLWkMtImpl	$\not\Rightarrow$	\NotVWkImpl	$\not\Rightarrow$	\NotXWkImpl
$\not\in$	\NotSInEquv	$\not\ni$	\NotVWkMtEquv	$\not\ni$	\NotXWkMtEquv
$\not\Leftarrow$	\NotSInImpl	$\not\Rightarrow$	\NotVWkMtImpl	$\not\Rightarrow$	\NotXWkMtImpl

logix requires either LuaLaTeX or XeLaTeX.

Table 189: esrelation Restrictions

$\downarrow$	\restrictbarb	$\downarrow$	\restrictmallet	$\downarrow$	\restrictwand
$\uparrow$	\restrictbarbup	$\uparrow$	\restrictmalletup	$\uparrow$	\restrictwandup

Table 190: MnSymbol Spoons

$\downarrow$	\downfilledspoon	$\not\circ$	\nnespoon	$\nwarrow$	\nwfilledspoon
$\downarrow$	\downspoon	$\not\nwarrow$	\nnwfilledspoon	$\nwarrow$	\nwspoon
$\leftarrow$	\leftfilledspoon	$\not\nwarrow$	\nnwspoon	$\rightarrow$	\rightfilledspoon
$\leftarrow$	\leftspoon	$\not\rightarrow$	\nrightfilledspoon	$\rightarrow$	\rightspoon*
$\not\downarrow$	\ndownfilledspoon	$\not\rightarrow$	\nrightspoon*	$\searrow$	\sefilledspoon
$\not\downarrow$	\ndownspoon	$\not\searrow$	\nsefilledspoon	$\searrow$	\sespoon
$\nearrow$	\nefilledspoon	$\not\searrow$	\nsespoon	$\swarrow$	\swfilledspoon
$\nearrow$	\nespoon	$\not\swarrow$	\nswfilledspoon	$\swarrow$	\swspoon
$\not\leftarrow$	\nleftfilledspoon	$\not\swarrow$	\nswspoon	$\uparrow$	\upfilledspoon
$\not\leftarrow$	\nleftspoon	$\not\uparrow$	\nupfilledspoon	$\uparrow$	\upspoon
$\not\nearrow$	\nnefilledspoon	$\not\uparrow$	\nupspoon		

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

Table 191: MnSymbol Pitchforks

⋔	\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 192: MnSymbol Smiles and Frowns

⋒	\doublefrown	⋣	\nsmileeq	⋢	\smileeq
⋓	\doublefrowneq	⋣	\nsmileeqfrown	⋢	\smileeqfrown
⋔	\doublesmile	⋡	\nsmilefrown	⋤	\smilefrown
⋕	\doublesmileeq	⋡	\nsmilefrowneq	⋤	\smilefrowneq
⋓	\eqfrown	⋔	\nsqdoublefrown	⋒	\sqdoublefrown
⋓	\eqsmile	⋔	\nsqdoublefrowneq	⋓	\sqdoublefrowneq
⌒	\frown	⋣	\nsqdoublesmile	⋔	\sqdoublesmile
⌓	\frowneq	⋣	\nsqdoublesmileeq	⋕	\sqdoublesmileeq
⋓	\frowneqsmile	⋡	\nsqeqfrown	⋓	\sqeqfrown
⋔	\frownsmile	⋡	\nsqeqsmile	⋓	\sqeqsmile
⋕	\frownsmileeq	⋢	\nsqfrown	⌒	\sqfrown
⋔	\ndoublefrown	⋢	\nsqfrowneq	⌓	\sqfrowneq
⋔	\ndoublefrowneq	⋢	\nsqfrowneqsmile	⋓	\sqfrowneqsmile
⋣	\ndoublesmile	⋢	\nsqfrownsmile	⋔	\sqfrownsmile
⋣	\ndoublesmileeq	⋣	\nsqsmile	⌣	\sqsmile
⋡	\neqfrown	⋣	\nsqsmileeq	⋢	\sqsmileeq
⋡	\neqsmile	⋣	\nsqsmileeqfrown	⋢	\sqsmileeqfrown
⋢	\nfrown	⋡	\nsqsmilefrown	⋤	\sqsmilefrown
⋢	\nfrowneq	⋔	\nsqtriplefrown	⋒	\sqtriplefrown
⋢	\nfrowneqsmile	⋣	\nsqtriplesmile	⋔	\sqtriplesmile
⋢	\nfrownsmile	⋔	\ntriplefrown	⋒	\triplefrown
⋢	\nfrownsmileeq	⋣	\ntriplesmile	⋔	\triplesmile
⋣	\nsmile	⌣	\smile		

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

Table 193: fdsymbol Spoons

•⊸	\blackwhitespoon	⚷	\ndownblackspoon	⚲	\nupblackspoon
⚲	\downblackspoon	⚷	\ndownspoon	⚲	\nupspoon
⚲	\downspoon	•⊬	\nleftblackspoon	⊶⊬•	\nwhiteblackspoon
•⊸	\leftblackspoon	•⊬•	\nleftrightblackspoon	⊸•	\rightblackspoon
•⊸•	\leftrightblackspoon	⊶⊬	\nleftrightspoon	⊸	\rightspoon
⊶⊸	\leftrightspoon	⊶⊬	\nleftspoon	⚲	\upblackspoon
⊶	\leftspoon	⊬•	\nrightblackspoon	⚲	\upspoon
•⊬	\nblackwhitespoon	⊬	\nrightspoon	⊶•	\whiteblackspoon

fdsymbol defines synonyms for many of the preceding symbols:

⚲	\cirmid	⊶	\multimapinv	⊬	\nmultimap
⊶⊸	\dualmap	⚲	\ncirmid	⊶⊬	\nmultimapinv
•⊸	\imageof	⊶⊬	\ndualmap	⊶⊬•	\norigof
⚲	\midcir	•⊬	\nimageof	⊶•	\origof
⊸	\multimap	⚷	\nmidcir		

Table 194: fdsymbol Pitchforks

Ψ	\downpitchfork	⊸∉	\nleftpitchfork	∋⊸	\rightpitchfork
⊸∈	\leftpitchfork	∌⊸	\nrightpitchfork	⋔	\uppitchfork
Ψ̸	\ndownpitchfork	⋔̸	\nuppitchfork		

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

Table 195: fdsymbol Smiles and Frowns

⌢	\frown	≢	\nfrowneq	≮	\nsmilefrown
≙	\frowneq	⊄	\nfrownsmile	⌣	\smile
⊂	\frownsmile	⊬	\nsmile	≅	\smileeq
⊬	\nfrown	≢	\nsmileeq	≍	\smilefrown

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

Table 196: halloweenmath Brooms and Pitchforks

⊸∈	\hmleftpitchfork	⊸⋖	\leftbroom
∋⊸	\hmrightpitchfork	⋗⊸	\rightbroom

Table 197: ulsy Contradiction Symbols

↯	\blitza	↯	\blitzb	↯	\blitzc	↯	\blitzd	↯	\blitze

Table 198: Extension Characters

–	\relbar	=	\Relbar

Table 199: stmaryrd Extension Characters

⇁	\Arrownot	↦	\Mapsfromchar	↤	\Mapstochar
↛	\arrownot	↦	\mapsfromchar		

Table 200: txfonts/pxfonts Extension Characters

⇸	\Mappedfromchar	⇸	\Mmappedfromchar	⇸	\Mmapstochar
⇸	\mappedfromchar	⇸	\mmappedfromchar	⇸	\mmapstochar

Table 201: mathabx Extension Characters

↦	\mapsfromchar	↦	\mapstochar
↦	\Mapsfromchar	↦	\Mapstochar

Table 202: stix Extension Characters

⊂	\lhook	-	\relbar	≣	\RRelbar
↦	\mapsfromchar	=	\Relbar	≡	\Rrelbar
↦	\mapstochar	⊃	\rhook		

Table 203: Log-like Symbols

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

Calling the above "symbols" may be a bit misleading.[3] Each log-like symbol merely produces the eponymous textual equivalent, but with proper surrounding spacing. See Section 12.4 for more information about log-like symbols. As \bmod and \pmod arguably are not symbols we refer the reader to the Short Math Guide for LaTeX [Dow00] for samples.

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

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

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

Table 205: mismath Log-like Symbols

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

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

Table 206: mismath Asymptotic Notation

O	`\bigo`	$\mathcal{O}$	`\bigO`	o	`\lito`

Table 207: GiNA2e Number Sets

$\mathbb{C}$	`\Complex`	$\mathbb{Z}$	`\Integer`	$\mathbb{N}$	`\Natural`	$\mathbb{Q}$	`\Rational`	$\mathbb{R}$	`\Real`
$\mathbf{C}$	`\COMPLEX`	$\mathbf{Z}$	`\INTEGER`	$\mathbf{N}$	`\NATURAL`	$\mathbf{Q}$	`\RATIONAL`	$\mathbf{R}$	`\REAL`

[3] Michael J. Downes prefers the more general term, "atomic math objects".

Table 208: Greek Letters

α	\alpha	θ	\theta	o	o	τ	\tau
β	\beta	ϑ	\vartheta	π	\pi	υ	\upsilon
γ	\gamma	ι	\iota	ϖ	\varpi	ϕ	\phi
δ	\delta	κ	\kappa	ρ	\rho	φ	\varphi
ϵ	\epsilon	λ	\lambda	ϱ	\varrho	χ	\chi
ε	\varepsilon	μ	\mu	σ	\sigma	ψ	\psi
ζ	\zeta	ν	\nu	ς	\varsigma	ω	\omega
η	\eta	ξ	\xi				
Γ	\Gamma	Λ	\Lambda	Σ	\Sigma	Ψ	\Psi
Δ	\Delta	Ξ	\Xi	Υ	\Upsilon	Ω	\Omega
Θ	\Theta	Π	\Pi	Φ	\Phi		

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 XeLaTeX, or copy `mathspec.sty`'s Greek-letter definitions to your document's preamble:

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

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

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

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

$\digamma$	\digamma	$\varkappa$	\varkappa

Table 210: txfonts/pxfonts Upright Greek Letters

α	\alphaup	θ	\thetaup	π	\piup	ϕ	\phiup
β	\betaup	ϑ	\varthetaup	ϖ	\varpiup	φ	\varphiup
γ	\gammaup	ι	\iotaup	ρ	\rhoup	χ	\chiup
δ	\deltaup	κ	\kappaup	ϱ	\varrhoup	ψ	\psiup
ϵ	\epsilonup	λ	\lambdaup	σ	\sigmaup	ω	\omegaup
ε	\varepsilonup	μ	\muup	ς	\varsigmaup		
ζ	\zetaup	ν	\nuup	τ	\tauup		
η	\etaup	ξ	\xiup	υ	\upsilonup		

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

Table 211: upgreek Upright Greek Letters

α	\upalpha	θ	\uptheta	π	\uppi	ϕ	\upphi
β	\upbeta	ϑ	\upvartheta	ϖ	\upvarpi	φ	\upvarphi
γ	\upgamma	ι	\upiota	ρ	\uprho	χ	\upchi
δ	\updelta	κ	\upkappa	ρ	\upvarrho	ψ	\uppsi
ϵ	\upepsilon	λ	\uplambda	σ	\upsigma	ω	\upomega
ε	\upvarepsilon	μ	\upmu	σ	\upvarsigma		
ζ	\upzeta	ν	\upnu	τ	\uptau		
η	\upeta	ξ	\upxi	υ	\upupsilon		
Γ	\Upgamma	Λ	\Uplambda	Σ	\Upsigma	Ψ	\Uppsi
Δ	\Updelta	Ξ	\Upxi	Υ	\Upupsilon	Ω	\Upomega
Θ	\Uptheta	Π	\Uppi	Φ	\Upphi		

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, "ΓΔΘαβγ" (Euler) with "ΓΔΘαβγ" (Symbol). Also note that the \var... forms do not always produce a distinct glyph.

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

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

Table 212: fourier Variant Greek Letters

π	\pi	ρ	\rho
ϖ	\varpi	ϱ	\varrho
ϖ	\varvarpi	ϱ	\varvarrho

Table 213: txfonts/pxfonts Variant Latin Letters

g	\varg	v	\varv	w	\varw	y	\vary

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

Table 214: boisik Variant Greek Letters

β	\varbeta	$\varkappa$	\varkappa	ϖ	\varpi	ς	\varsigma
ε	\varepsilon	φ	\varphi	ϱ	\varrho	ϑ	\vartheta

Table 215: boisik Variant Latin Letters

g	\varg

Table 216: stix Variant Greek Letters

ε	\varepsilon	φ	\varphi	ϱ	\varrho	ϑ	\vartheta
$\varkappa$	\varkappa	ϖ	\varpi	ς	\varsigma		

Table 217: stix Transformed Greek Letters

$\ni$	\backepsilon	ι	\turnediota
$\mho$	\mho	$\ni$	\upbackepsilon

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

ב	\beth	ג	\gimel	ד	\daleth

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

Table 219: MnSymbol Hebrew Letters

א	\aleph	ב	\beth	ג	\gimel	ד	\daleth

Table 220: fdsymbol Hebrew Letters

א	\aleph	ב	\beth	ג	\gimel	ד	\daleth

Table 221: boisik Hebrew Letters

ב	\beth	ג	\gimel	ד	\daleth		

Table 222: stix Hebrew Letters

א	\aleph	ב	\beth	ג	\gimel	ד	\daleth

Table 223: Letter-like Symbols

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

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

$\Bbbk$	\Bbbk	$\complement$	\complement	$\hbar$	\hbar
®	\circledR	$\Finv$	\Finv	$\hslash$	\hslash
Ⓢ	\circledS	$\Game$	\Game	$\nexists$	\nexists

Table 225: txfonts/pxfonts Letter-like Symbols

¢	\mathcent	£	\mathsterling*	∉	\notin	∌	\notni

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

Table 226: mathabx Letter-like Symbols

$\barin$	\barin	$\in$	\in	$\nottop$	\nottop	$\notin$	\varnotin
$\complement$	\complement	$\nexists$	\nexists	$\ni$	\owns	$\notni$	\varnotowner
$\exists$	\exists	$\notbot$	\notbot	$\owns$	\ownsbar		
$\Finv$	\Finv	$\notin$	\notin	∂	\partial		
$\Game$	\Game	$\notni$	\notowner	$\partialslash$	\partialslash		

Table 227: MnSymbol Letter-like Symbols

⊥	\bot	∈	\in	∌	\nowns	⊤	\top
∃	\exists	∄	\nexists	∋	\owns	℘	\wp
∀	\forall	∉	\nin	℘	\powerset		

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

Table 228: fdsymbol Letter-like Symbols

⊥	\bot	∀	\forall	∈	\in	∋	\owns
∁	\complement	⅁	\Game	∄	\nexists	⊤	\top
∃	\exists	ℏ	\hbar	∉	\nin	℘	\wp
ⅎ	\Finv	ℏ	\hslash	∌	\nowns		

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

Table 229: boisik Letter-like Symbols

𝕜	\Bbbk	⅁	\Game	ι	\imath	∄	\nexists
∁	\complement	ℏ	\hbar	⊺	\intercal	ρ	\wp
ⅎ	\Finv	ℏ	\hslash	ȷ	\jmath		

Table 230: stix Letter-like Symbols

Å	\Angstrom	Ɛ	\Eulerconst	ι	\imath	⊤	\top
𝕜	\Bbbk	∃	\exists	⊺	\intercal	⌶	\topbot
⊥	\bot	ⅎ	\Finv	ȷ	\jmath	℘	\wp
®	\circledR	∀	\forall	$	\mathdollar	⅄	\Yup
Ⓢ	\circledS	⅁	\Game	¶	\mathparagraph	ℨ	\Zbar
∁	\complement	ℏ	\hbar	£	\mathsterling		
ϝ	\digamma	ℏ	\hslash	∄	\nexists		
ℓ	\ell	ℑ	\Im	ℜ	\Re		

Table 231: trfsigns Letter-like Symbols

e	\e	j	\im

Table 232: mathdesign Letter-like Symbols

∈	\in	∋	\owns
∉	\notin	∈	\smallin
∉	\notsmallin	∋	\smallowns
∌	\notsmallowns		

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

Table 233: fge Letter-like Symbols

𝔄	\fgeA	𝔤	\fgeeszett	𝔅	\fgeleftB	𝔣	\fges
𝔠	\fgec	𝓕	\fgeF	ℭ	\fgeleftC		
𝔭	\fged	𝔣	\fgef	⅋	\fgemark*		
𝔢	\fgee	𝔭	\fgelb*	𝔅	\fgerightB		

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

Table 234: fourier Letter-like Symbols

𝜕	\partial	𝜕	\varpartialdiff

Table 235: cmll Letter-like Symbols

⅋	\Bot	⫫	\simbot

Table 236: logix Proof Symbols

∃	\BnchExists	⊥	\Bot	∀̃	\HdnForAll	⊬	\TFBoth
∀	\BnchForAll	:=	\Defn	⊣	\NFalse	⊥	\TFNone
∃̃	\BnchHdnExists	□	\End	∄	\NtExists	⊤	\Top
∀̃	\BnchHdnForAll	∃	\Exists	⊥	\NTrue	⊤	\True
∄	\BnchNtExists	⊬	\False	■	\Qed	∃!	\Unique
∃!	\BnchUnique	∀	\ForAll	∧	\QuantCon		
ƛ	\BndMap	∃̃	\HdnExists	∨	\QuantDis		

logix requires either LuaLaTeX or XeLaTeX.

Table 237: endofproofwd End-of-Proof Symbols

`\wasserdicht`

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

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

Table 238: $\mathcal{AMS}$ Delimiters

⌜	`\ulcorner`	⌝	`\urcorner`
⌞	`\llcorner`	⌟	`\lrcorner`

Table 239: stmaryrd Delimiters

⟅	`\Lbag`	⟆	`\Rbag`	⟅	`\lbag`	⟆	`\rbag`
⌈	`\llceil`	⌉	`\rrceil`	⌊	`\llfloor`	⌋	`\rrfloor`
⦇	`\llparenthesis`	⦈	`\rrparenthesis`				

Table 240: mathabx Delimiters

⌜	`\lcorners`	⌝	`\rcorners`
⌜	`\ulcorner`	⌝	`\urcorner`
⌞	`\llcorner`	⌟	`\lrcorner`

Table 241: boisik Delimiters

⌜	`\ulcorner`	⌝	`\urcorner`
⌞	`\llcorner`	⌟	`\lrcorner`

Table 242: stix Delimiters

⦉	`\langledot`	⦊	`\rangledot`	⦇	`\llangle`	⦈	`\rrangle`
⟅	`\lbag`	⟆	`\rbag`	⌞	`\llcorner`	⌟	`\lrcorner`
❪	`\lblkbrbrak`	❫	`\rblkbrbrak`	⦇	`\llparenthesis`	⦈	`\rrparenthesis`
⦋	`\lbrackllltick`	⦌	`\rbrackurtick`	⪻	`\Lparengtr`	⪼	`\Rparenless`
⦋	`\lbrackubar`	⦌	`\rbrackubar`	⦓	`\lparenless`	⦔	`\rparengtr`
⦍	`\lbrackultick`	⦎	`\rbracklrtick`	⧙	`\lvzigzag`	⧚	`\rvzigzag`
⦇	`\Lbrbrak`	⦈	`\Rbrbrak`	⧛	`\Lvzigzag`	⧜	`\Rvzigzag`
⦑	`\lcurvyangle`	⦒	`\rcurvyangle`	⌜	`\ulcorner`	⌝	`\urcorner`

Table 243: nath Delimiters

∟	\niv	⌟	\vin

Table 244: Variable-sized Delimiters

↓	⏐	\downarrow	⇓	‖	\Downarrow	[	⎡	[	]	⎤	]
⟨	⟨	\langle	⟩	⟩	\rangle	|	⏐	|	‖	‖	\\|
⌈	⎡	\lceil	⌉	⎤	\rceil	↑	⏐	\uparrow	⇑	‖	\Uparrow
⌊	⎣	\lfloor	⌋	⎦	\rfloor	↕	⏐	\updownarrow	⇕	‖	\Updownarrow
(	⎛	(	)	⎞	)	{	⎧	\{	}	⎫	\}
/	╱	/	\	╲	\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 \|.

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: "$\langle\phi|\psi\rangle$"). This is exactly what the quantikz package does (see Table 370 on page 171). A similar effect can be achieved in conventional LATEX using the braket package.

Table 245: Large, Variable-sized Delimiters

∫	⎮	\lmoustache	⎭	⎭	\rmoustache	(	⎜	\lgroup	)	⎟	\rgroup
⏐	⏐	\arrowvert	‖	‖	\Arrowvert	⏐	⏐	\bracevert			

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

$\lvert$	$\left\lvert\right.$	`\lvert`	$\rvert$	$\left.\right\rvert$	`\rvert`
$\lVert$	$\left\lVert\right.$	`\lVert`	$\rVert$	$\left.\right\rVert$	`\rVert`

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

Table 247: stmaryrd Variable-sized Delimiters

$[\![$	$\left[\!\right[$	`\llbracket`	$]\!]$	$\left.\right]\!]$	`\rrbracket`

Table 248: mathabx Variable-sized Delimiters

$\llbracket$	$\left\llbracket\right.$	`\ldbrack`	$\rrbracket$	$\left.\right\rrbracket$	`\rdbrack`
$\lfilet$	$\left\lfilet\right.$	`\lfilet`	$\rfilet$	$\left.\right\rfilet$	`\rfilet`
$\thickvert$	$\left\thickvert\right.$	`\thickvert`	$\vvvert$	$\left.\right\vvvert$	`\vvvert`

Table 249: MnSymbol Variable-sized Delimiters

$\Arrowvert$	$\left\Arrowvert\right.$	`\Arrowvert`	$\lbrace$	$\left\lbrace\right.$	`\lbrace`
$\arrowvert$	$\left\arrowvert\right.$	`\arrowvert`	$\lceil$	$\left\lceil\right.$	`\lceil`
$\rbrace$	$\left.\right\rbrace$	`\rbrace`	$\rceil$	$\left.\right\rceil$	`\rceil`
$\rfloor$	$\left.\right\rfloor$	`\rfloor`			

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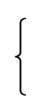
\	$\backslash$	\backslash	⌊	$\lfloor$	\lfloor	)	$\rgroup$	\rgroup
∣	$\vert$	\vert	(	$\lgroup$	\lgroup	⌉	$\rmoustache$	\rmoustache
[	$[$	[	⟪	$\llangle$	\llangle	⟫	$\rrangle$	\rrangle
]	$]$	]	⌞	$\llcorner$	\llcorner	⟧	$\rsem$	\rsem
(	$($	(	∫	$\lmoustache$	\lmoustache	⦚	$\rWavy$	\rWavy
)	$)$	)	⌟	$\lrcorner$	\lrcorner	⦙	$\rwavy$	\rwavy
/	$/$	/	⟦	$\lsem$	\lsem	⌜	$\ulcorner$	\ulcorner
⟨	$\langle$	<	⦙	$\lwavy$	\lwavy	⌜ ⌞	$\ullcorner$	\ullcorner
⟩	$\rangle$	>	⦚	$\lWavy$	\lWavy	⌝ ⌟	$\ulrcorner$	\ulrcorner
∣	$\vert$	\vert	⟩	$\rangle$	\rangle	⌝	$\urcorner$	\urcorner
⟨	$\langle$	\langle	⟩	$\ranglebar$	\ranglebar	∥	$\Vert$	\Vert
⟨	$\langle$	\langlebar	}	$\rbrace$	\rbrace			

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

Table 250: fdsymbol Variable-sized Delimiters

\		\backslash	⌟		\lrcorner	)		\rparen
↓		\downarrow	|		\lvert	|		\rvert
⇓		\Downarrow	‖		\lVert	‖		\rVert
⟪		\lAngle	⫼		\lVvert	⫼		\rVvert
⟨		\langle	/		\mathslash	⌜		\ulcorner
⟨·		\langledot	⟩		\rangle	⌜⌞		\ullcorner
{		\lbrace	⟫		\rAngle	⌝⌟		\ulrcorner
[		\lbrack	⟩·		\rangledot	↑		\uparrow
⟦		\lBrack	}		\rbrace	⇑		\Uparrow
⌈		\lceil	⟧		\rBrack	↕		\updownarrow
⌊		\lfloor	]		\rbrack	⇕		\Updownarrow
⦃		\lgroup	⌉		\rceil	⌝		\urcorner
⌞⌞		\llcorner	⌋		\rfloor	|		\vert

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⎰	⎰	\lmoustache	⎱	⎱	\rgroup	‖	‖	\Vert
(	⎛	\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 251: stix Variable-sized Delimiters

⏐	⏐	\Arrowvert	⟪	⟪	\lAngle	⌉	⌉	\rceil
⏐	⏐	\arrowvert	{	⎧	\lbrace	⌋	⌋	\rfloor
\	\	\backslash	⦃	⦃	\lBrace	)	⎫	\rgroup
⤋	⤋	\Ddownarrow	⟦	⟦	\lBrack	⎱	⎱	\rmoustache
⤋	⤋	\DDownarrow	(	⎝	\lbrbrak	⟩	⟩	\rParen
↓	↓	\downarrow	⌈	⌈	\lceil	↑	↑	\uparrow

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⇓		\Downarrow	⌊		\lfloor	⇑		\Uparrow
[		[	(		\lgroup	⇕		\Updownarrow
]		]	∫		\lmoustache	↕		\updownarrow
(		(	⦇		\lParen	⟰		\Uuparrow
)		)	⟫		\rAngle	⟰		\UUparrow
/		/	⟩		\rangle	‖		\Vert
⟨		<	}		\rbrace	|		\vert
⟩		>	⦄		\rBrace	⦀		\Vvert
|		|	⟧		\rBrack			
⟨		\langle	)		\rbrbrak			

Table 252: 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 253: nath Variable-sized Delimiters (Double)

⟪	⟪	\lAngle	⟫	⟫	\rAngle
⟦	⟦	\lBrack	⟧	⟧	\rBrack
⌈	⌈	\lCeil	⌉	⌉	\rCeil
⌊	⌊	\lFloor	⌋	⌋	\rFloor
‖	‖	\lVert*	‖	‖	\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 253 can also be expressed using the \double macro. See the nath documentation for examples and additional information.

Table 254: nath Variable-sized Delimiters (Triple)

⋘	⋘	\triple<	⋙	⋙	\triple>
⟦⟦	⟦⟦	\triple[	⟧⟧	⟧⟧	\triple]
⦀	⦀	\ltriple|*	⦀	⦀	\rtriple|*

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

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

Table 255: fourier Variable-sized Delimiters

⟦	⟦	\llbracket	⟧	⟧	\rrbracket
⦀	⦀	\VERT			

Table 256: logix Variable-sized Delimiters

$\vert$	$\left\vert\right.$	\BndBar			
$\langle$	$\left\langle\right.$	\OpnAngl	$\rangle$	$\left.\right\rangle$	\ClsAngl
$\langle\!\vert$	$\left\langle\!\right\vert$	\OpnAnglBar	$\vert\!\rangle$	$\left.\right\vert\!\rangle$	\ClsAnglBar
$\leftarrow\!\!\{$	$\left\leftarrow\!\!\{\right.$	\OpnArrwBrac	$\}\!\!\rightarrow$	$\left.\right\}\!\!\rightarrow$	\ClsArrwBrac
$\vert$	$\left\vert\right.$	\OpnBar	$\vert$	$\left.\right\vert$	\ClsBar
$\{$	$\left\{\right.$	\OpnBrac	$\}$	$\left.\right\}$	\ClsBrac
$\{\!\!\{$	$\left\{\!\!\{\right.$	\OpnBracBar	$\}\!\!\}$	$\left.\right\}\!\!\}$	\ClsBracBar
$\{\!\!\backslash$	$\left\{\!\!\backslash\right.$	\OpnBrknBrac	$\}$	$\left.\right\backslash$	\ClsBrknBrac
$\{\!\!\{\!\!\backslash$	$\left\{\!\!\{\!\!\backslash\right.$	\OpnBrknBracBar	$\}\!\!\}$	$\left.\right\backslash\!\!\}$	\ClsBrknBracBar
$\lceil\!\!\backslash$	$\left\lceil\!\!\backslash\right.$	\OpnBrknBrkt	$\}$	$\left.\right\backslash$	\ClsBrknBrkt
$\lceil\!\!\lceil\!\!\backslash$	$\left\lceil\!\!\lceil\!\!\backslash\right.$	\OpnBrknBrktBar	$\}\!\!\}$	$\left.\right\backslash\!\!\}$	\ClsBrknBrktBar
$[$	$\left[\right.$	\OpnBrkt	$]$	$\left.\right]$	\ClsBrkt
$[\![$	$\left[\!\right[\right.$	\OpnBrktBar	$]\!]$	$\left.\right]\!]$	\ClsBrktBar
$\lceil$	$\left\lceil\right.$	\OpnCeil	$\rceil$	$\left.\right\rceil$	\ClsCeil
$\circ\!\!\{$	$\left\circ\!\!\{\right.$	\OpnCircBrac	$\}\!\!\circ$	$\left.\right\}\!\!\circ$	\ClsCircBrac
$\circ\!\!\{\!\!\{$	$\left\circ\!\!\{\!\!\{\right.$	\OpnCircBracBar	$\}\!\!\}\!\!\circ$	$\left.\right\}\!\!\}\!\!\circ$	\ClsCircBracBar
$\circ\!\!\lceil$	$\left\circ\!\!\lceil\right.$	\OpnCircBrkt	$\rceil\!\!\circ$	$\left.\right\rceil\!\!\circ$	\ClsCircBrkt
$\circ\!\!\lceil\!\!\lceil$	$\left\circ\!\!\lceil\!\!\lceil\right.$	\OpnCircBrktBar	$\rceil\!\!\rceil\!\!\circ$	$\left.\right\rceil\!\!\rceil\!\!\circ$	\ClsCircBrktBar
$\{$	$\left\{\right.$	\OpnCrlyBrkt	$\}$	$\left.\right\}$	\ClsCrlyBrkt
$\{\!\!\{$	$\left\{\!\!\{\right.$	\OpnCrlyBrktBar	$\}\!\!\}$	$\left.\right\}\!\!\}$	\ClsCrlyBrktBar
$\langle$	$\left\langle\right.$	\OpnCurvAngl	$\rangle$	$\left.\right\rangle$	\ClsCurvAngl
$\langle\!\langle$	$\left\langle\!\langle\right.$	\OpnDblAngl	$\rangle\!\rangle$	$\left.\right\rangle\!\rangle$	\ClsDblAngl
$\Vert$	$\left\Vert\right.$	\OpnDblBar	$\Vert$	$\left.\right\Vert$	\ClsDblBar

(continued on next page)

(continued from previous page)

⦃	⦃	\OpnDblBrac	⦄	⦄	\ClsDblBrac
⟦	⟦	\OpnDblCeil	⟧	⟧	\ClsDblCeil
⟬	⟬	\OpnDblFloor	⟭	⟭	\ClsDblFloor
⟦	⟦	\OpnDblGrp	⟧	⟧	\ClsDblGrp
⦅	⦅	\OpnDblParn	⦆	⦆	\ClsDblParn
⌊	⌊	\OpnFloor	⌋	⌋	\ClsFloor
[	[	\OpnGrp	]	]	\ClsGrp
(	(	\OpnParn	)	)	\ClsParn
⦇	⦇	\OpnParnBar	⦈	⦈	\ClsParnBar
⟦	⟦	\OpnSqrParn	⟧	⟧	\ClsSqrParn
⦗	⦗	\OpnTortoise	⦘	⦘	\ClsTortoise
⦇	⦇	\OpnTortoiseBar	⦈	⦈	\ClsTortoiseBar
⦀	⦀	\OpnTrpBar	⦀	⦀	\ClsTrpBar
⊢	⊢	\OpnTurn	⊣	⊣	\ClsTurn

logix requires either LuaLaTeX or XeLaTeX.

Table 257: textcomp Text-mode Delimiters

⟨	\textlangle	⟩	\textrangle
⟦	\textlbrackdbl	⟧	\textrbrackdbl
{	\textlquill	}	\textrquill

Table 258: metre Text-mode Delimiters

}	\alad	}	\Alad	†	\crux	†	\Crux
{	\alas	{	\Alas	⟧	\quadrad	⟧	\Quadrad
⟩	\angud	⟩	\Angud	⟦	\quadras	⟦	\Quadras
⟨	\angus	⟨	\Angus				

Table 259: Math-mode Accents

$\acute{a}$	`\acute{a}`	$\check{a}$	`\check{a}`	$\grave{a}$	`\grave{a}`	$\tilde{a}$	`\tilde{a}`
$\bar{a}$	`\bar{a}`*	$\ddot{a}$	`\ddot{a}`	$\hat{a}$	`\hat{a}`	$\vec{a}$	`\vec{a}`
$\breve{a}$	`\breve{a}`	$\dot{a}$	`\dot{a}`	$\mathring{a}$	`\mathring{a}`		

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

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

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

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

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

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

Table 261: MnSymbol Math-mode Accents

$\vec{a}$	`\vec{a}`

Table 262: fdsymbol Math-mode Accents

a	`\middlebar{a}`	$\not{a}$	`\strokethrough{a}`
a	`\middleslash{a}`	$\vec{a}$	`\vec{a}`

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

Table 263: boisik Math-mode Accents

$\vec{\text{a}}$	`\vec{a}`

Table 264: stix Math-mode Accents

$\acute{a}$	`\acute{a}`	$\hat{a}$	`\hat{a}`
$\annuity{a}$	`\annuity{a}`	$\overleftarrow{a}$	`\leftarrowaccent{a}`
$\overset{*}{a}$	`\asteraccent{a}`	$\overleftharpoon{a}$	`\leftharpoonaccent{a}`
$\bar{a}$	`\bar{a}`	$\overleftrightarrow{a}$	`\leftrightarrowaccent{a}`
$\breve{a}$	`\breve{a}`	$\mathring{a}$	`\mathring{a}`
$\candra{a}$	`\candra{a}`	$\ocommatopright{a}$	`\ocommatopright{a}`
$\check{a}$	`\check{a}`	$\oturnedcomma{a}$	`\oturnedcomma{a}`
$\ddddot{a}$	`\ddddot{a}`	$\ovhook{a}$	`\ovhook{a}`
$\dddot{a}$	`\dddot{a}`	$\overrightharpoon{a}$	`\rightharpoonaccent{a}`
$\ddot{a}$	`\ddot{a}`	$\tilde{a}$	`\tilde{a}`
$\dot{a}$	`\dot{a}`	$\vec{a}$	`\vec{a}`
$\droang{a}$	`\droang{a}`	$\overline{a}$	`\widebridgeabove{a}`
$\grave{a}$	`\grave{a}`		

Table 265: fge Math-mode Accents

Å̊å	`\spiritusasper{A}\spiritusasper{a}`
Å̔å	`\spirituslenis{A}\spirituslenis{a}`

When fge is passed the crescent option, these symbols instead uses a crescent accent as in "å" and "å".

Table 266: yhmath Math-mode Accents

$\mathring{a}$	`\ring{a}`

This symbol is largely obsolete, as standard LaTeX 2$_\varepsilon$ has supported `\mathring` (Table 259) since June 1998 [LaT98].

Table 267: pdfMsym Math-mode Accents

$\overleftarrow{a}$	\shortlvecc{a}	$\underset{\rightharpoonup}{a}$	\shortunderleftrightharp{a}
$\overleftarrow{a}$	\shortoverleftharp{a}	$\underset{\rightleftharpoons}{a}$	\shortunderleftrightvecc{a}
$\overleftrightarrow{a}$	\shortoverleftrightharp{a}	$\underset{\leftarrow}{a}$	\shortunderlvecc{a}
$\overleftrightarrow{a}$	\shortoverleftrightvecc{a}	$\underset{\rightharpoonup}{a}$	\shortunderrightharp{a}
$\overrightarrow{a}$	\shortoverrightharp{a}	$\underset{\rightharpoonup}{a}$	\shortunderrightleftharp{a}
$\overrightarrow{a}$	\shortoverrightleftharp{a}	$\underset{\leftarrow}{a}$	\shortunderstraightlvecc{a}
$\overleftarrow{a}$	\shortstraightlvecc{a}	$\underset{\rightarrow}{a}$	\shortunderstraightvecc{a}
$\overrightarrow{a}$	\shortstraightvecc{a}	$\underset{\rightarrow}{a}$	\shortundervecc{a}
$\underset{\leftharpoondown}{a}$	\shortunderleftharp{a}	$\overrightarrow{a}$	\shortvecc{a}

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

Table 268: halloweenmath Halloween-Themed Math-mode Accents

$\overbat{a}$	\overbat{a}	$\underbat{a}$	\underbat{a}
$\overbat{a}$	\overbat*{a}	$\underbat{a}$	\underbat*{a}

Table 269: realhats Math-mode Hat Accents

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

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

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

Table 270: Extensible Accents

$\widetilde{abc}$	`\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 276 for a sample of this symbol. See also the polynom package, which automatically solves and typesets polynomial-division problems in a similar manner.

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

† If you're looking for an extensible *diagonal* line or arrow to be used for canceling or reducing mathematical subexpressions (e.g., "$\cancel{x+=x}$" or "$\cancel{3+2}^{5}$") 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 271: overrightarrow Extensible Accents

$\overRightarrow{abc}$	`\Overrightarrow{abc}`

Table 272: yhmath Extensible Accents

$\widehat{abc}$	`\widehat{abc}`	$\widetilde{abc}$	`\widetilde{abc}`
$\wideparen{abc}$	`\wideparen{abc}`	$\widehat{abc}$	`\widetriangle{abc}`
$\mathring{abc}$	`\widering{abc}`		

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

$\overleftrightarrow{abc}$	`\overleftrightarrow{abc}`	$\underleftrightarrow{abc}$	`\underleftrightarrow{abc}`
$\underleftarrow{abc}$	`\underleftarrow{abc}`	$\underrightarrow{abc}$	`\underrightarrow{abc}`

Table 274: MnSymbol Extensible Accents

$\overbrace{abc}$	`\overbrace{abc}`	$\underbrace{abc}$	`\underbrace{abc}`
$\overgroup{abc}$	`\overgroup{abc}`	$\underlinesegment{abc}$	`\underlinesegment{abc}`
$\overleftharpoon{abc}$	`\overleftharpoon{abc}`	$\widehat{abc}$	`\widehat{abc}`
$\overlinesegment{abc}$	`\overlinesegment{abc}`	$\widetilde{abc}$	`\widetilde{abc}`
$\overrightharpoon{abc}$	`\overrightharpoon{abc}`		
$\underbrace{abc}$	`\underbrace{abc}`		

Table 275: fdsymbol Extensible Accents

$\overbrace{abc}$	`\overbrace{abc}`	$\underbrace{abc}$	`\underbrace{abc}`
$\overgroup{abc}$	`\overgroup{abc}`	$\underlinesegment{abc}$	`\underlinesegment{abc}`
$\overleftharpoon{abc}$	`\overleftharpoon{abc}`	$\widehat{abc}$	`\widehat{abc}`
$\overlinesegment{abc}$	`\overlinesegment{abc}`	$\widetilde{abc}$	`\widetilde{abc}`
$\overrightharpoon{abc}$	`\overrightharpoon{abc}`		
$\underbrace{abc}$	`\underbrace{abc}`		

Table 276: stix Extensible Accents

$\overgroup{abc}$	`\longdivision{abc}`	$\underbracket{abc}$	`\underbracket{abc}`
$\overbrace{abc}$	`\overbrace{abc}`	$\underleftarrow{abc}$	`\underleftarrow{abc}`
$\overbracket{abc}$	`\overbracket{abc}`	$\underleftharpoon{abc}$	`\underleftharpoon{abc}`
$\overleftarrow{abc}$	`\overleftarrow{abc}`	$\underleftrightarrow{abc}$	`\underleftrightarrow{abc}`
$\overleftharpoon{abc}$	`\overleftharpoon{abc}`	$\underparen{abc}$	`\underparen{abc}`
$\overleftrightarrow{abc}$	`\overleftrightarrow{abc}`	$\underrightarrow{abc}$	`\underrightarrow{abc}`
$\overparen{abc}$	`\overparen{abc}`	$\underrightharpoon{abc}$	`\underrightharpoon{abc}`
$\overrightarrow{abc}$	`\overrightarrow{abc}`	$\widecheck{abc}$	`\widecheck{abc}`
$\overrightharpoon{abc}$	`\overrightharpoon{abc}`	$\widehat{abc}$	`\widehat{abc}`
$\sqrt{abc}$	`\sqrt{abc}`	$\widetilde{abc}$	`\widetilde{abc}`
$\underbrace{abc}$	`\underbrace{abc}`		

Table 277: mathtools Extensible Accents

$\overbrace{abc}$	`\overbrace{abc}`	$\underbrace{abc}$	`\underbrace{abc}`
$\overbracket{abc}$	`\overbracket{abc}`*	$\underbracket{abc}$	`\underbracket{abc}`*

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

Table 278: mathabx Extensible Accents

$\overbrace{abc}$	`\overbrace{abc}`	$\overline{abc}$	`\widebar{abc}`
$\overgroup{abc}$	`\overgroup{abc}`	$\widecheck{abc}$	`\widecheck{abc}`
$\underbrace{abc}$	`\underbrace{abc}`	$\wideparen{abc}$	`\wideparen{abc}`
$\undergroup{abc}$	`\undergroup{abc}`	$\widering{abc}$	`\widering{abc}`
$\overrightarrow{abc}$	`\widearrow{abc}`		

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

Table 279: fourier Extensible Accents

$\widearc{abc}$	`\widearc{abc}`	$\wideparen{abc}$	`\wideparen{abc}`
$\wideOarc{abc}$	`\wideOarc{abc}`	$\widering{abc}$	`\widering{abc}`

Table 280: esvect Extensible Accents

$\vec{abc}$	`\vv{abc}` with package option `a`
$\vec{abc}$	`\vv{abc}` with package option `b`
$\vec{abc}$	`\vv{abc}` with package option `c`
$\vec{abc}$	`\vv{abc}` with package option `d`
$\vec{abc}$	`\vv{abc}` with package option `e`
$\vec{abc}$	`\vv{abc}` with package option `f`
$\vec{abc}$	`\vv{abc}` with package option `g`
$\vec{abc}$	`\vv{abc}` with package option `h`

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

Table 281: pdfMsym Extensible Accents

$\overleftarrow{abc}$	`\lvecc{abc}`*	$\underleftarrow{abc}$	`\underlvecc{abc}`
$\overleftarrow{abc}$	`\overleftharp{abc}`*	$\underleftarrow{abc}$	`\underrightharp{abc}`
$\overleftrightarrow{abc}$	`\overleftrightharp{abc}`*	$\underleftrightarrow{abc}$	`\underrightleftharp{abc}`
$\overleftrightarrow{abc}$	`\overleftrightvecc{abc}`*	$\underleftrightarrow{abc}$	`\understraightlvecc{abc}`
$\overrightarrow{abc}$	`\overrightharp{abc}`*	$\underrightarrow{abc}$	`\understraightvecc{abc}`
$\overrightarrow{abc}$	`\overrightleftharp{abc}`*	$\underrightarrow{abc}$	`\undervecc{abc}`
$\overleftarrow{abc}$	`\straightlvecc{abc}`*	$\underbrace{abc}$	`\varwidecheck{abc}`
$\overrightarrow{abc}$	`\straightvecc{abc}`*	$\widehat{abc}$	`\varwidehat{abc}`
$\underleftarrow{abc}$	`\underleftharp{abc}`	$\widetilde{abc}$	`\varwidetilde{abc}`
$\underleftrightarrow{abc}$	`\underleftrightharp{abc}`	$\overrightarrow{abc}$	`\vecc{abc}`*
$\underleftrightarrow{abc}$	`\underleftrightvecc{abc}`		

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

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

Table 282: overarrows Extensible Accents

$\overline{abc}$	`\overbar{abc}`	$\underline{abc}$	`\underbar{abc}`
$\overleftarrow{abc}$	`\overleftarrow{abc}`	$\underleftarrow{abc}$	`\underleftarrow{abc}`
$\overleftharpoondown{abc}$	`\overleftharpoondown{abc}`	$\underleftharpoondown{abc}$	`\underleftharpoondown{abc}`
$\overleftharpoonup{abc}$	`\overleftharpoonup{abc}`	$\underleftharpoonup{abc}$	`\underleftharpoonup{abc}`
$\overleftrightarrow{abc}$	`\overleftrightarrow{abc}`	$\underleftrightarrow{abc}$	`\underleftrightarrow{abc}`
$\overrightarrow{abc}$	`\overrightarrow{abc}`	$\underrightarrow{abc}$	`\underrightarrow{abc}`
$\overrightharpoondown{abc}$	`\overrightharpoondown{abc}`	$\underrightharpoondown{abc}$	`\underrightharpoondown{abc}`
$\overrightharpoonup{abc}$	`\overrightharpoonup{abc}`	$\underrightharpoonup{abc}$	`\underrightharpoonup{abc}`

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

$\overarchedleftrightarrow{abc}$ `\overarchedleftrightarrow{abc}` $\overbandedarrow{abc}$ `\overbandedarrow{abc}`

Table 283: abraces Extensible Accents

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

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

Table 284: undertilde Extensible Accents

$\underbar{\tilde{abc}}$ `\utilde{abc}`

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

Table 285: ushort Extensible Accents

$\underline{\underline{abc}}$ `\ushortdw{abc}` $\underline{abc}$ `\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 "$\underline{x}\underline{y}\underline{x}\underline{y}$".

Table 286: mdwmath Extensible Accents

$\surd abc$ `\sqrt*{abc}`

Table 287: actuarialangle Extensible Accents

$\overline{abc|}$ `\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 ⌝, `\angln` as `\angl{n}`, and `\anglr` as `\angl{r}`.

Table 288: $\mathcal{AMS}$ Extensible Arrows

$\xleftarrow{abc}$ `\xleftarrow{abc}` $\xrightarrow{abc}$ `\xrightarrow{abc}`

Table 289: mathtools Extensible Arrows

$\xhookleftarrow{abc}$	`\xhookleftarrow{abc}`	$\xleftrightharpoons{abc}$	`\xleftrightharpoons{abc}`
$\xhookrightarrow{abc}$	`\xhookrightarrow{abc}`	$\xmapsto{abc}$	`\xmapsto{abc}`
$\xLeftarrow{abc}$	`\xLeftarrow{abc}`	$\xRightarrow{abc}$	`\xRightarrow{abc}`
$\xleftharpoondown{abc}$	`\xleftharpoondown{abc}`	$\xrightharpoondown{abc}$	`\xrightharpoondown{abc}`
$\xleftharpoonup{abc}$	`\xleftharpoonup{abc}`	$\xrightharpoonup{abc}$	`\xrightharpoonup{abc}`
$\xleftrightarrow{abc}$	`\xleftrightarrow{abc}`	$\xrightleftharpoons{abc}$	`\xrightleftharpoons{abc}`
$\xLeftrightarrow{abc}$	`\xLeftrightarrow{abc}`		

Table 290: chemarr Extensible Arrows

$\overset{abc}{\rightleftharpoons}$ `\xrightleftharpoons{abc}`

Table 291: chemarrow Extensible Arrows

$\xleftarrow[def]{abc}$ `\autoleftarrow{abc}{def}` $\xrightarrow[def]{abc}$ `\autorightarrow{abc}{def}`

$\xleftrightharpoons[def]{abc}$ `\autoleftrightharpoons{abc}{def}` $\xrightleftharpoons[def]{abc}$ `\autorightleftharpoons{abc}{def}`

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 292: extarrows Extensible Arrows

$\xLeftrightarrow{abc}$	`\xLeftrightarrow{abc}`	$\xLongleftrightarrow{abc}$	`\xLongleftrightarrow{abc}`
$\xleftrightarrow{abc}$	`\xleftrightarrow{abc}`	$\xlongleftrightarrow{abc}$	`\xlongleftrightarrow{abc}`
$\xlongequal{abc}$	`\xlongequal{abc}`	$\xLongrightarrow{abc}$	`\xLongrightarrow{abc}`
$\xLongleftarrow{abc}$	`\xLongleftarrow{abc}`	$\xrightarrow{abc}$	`\xlongrightarrow{abc}`
$\xleftarrow{abc}$	`\xlongleftarrow{abc}`		

Table 293: pdfMsym Extensible Arrows

$\xleftarrow{abc}$	\xvarCircleleftarrow{abc}	$\xLeftrightarrow{abc}$	\xvarLleftRrightarrow{abc}
$\xleftarrow{abc}$	\xvarcircleleftarrow{abc}	$\xmapsfrom{abc}$	\xvarmapsfrom{abc}
$\xRightarrow{abc}$	\xvarCirclerightarrow{abc}	$\xmapsto{abc}$	\xvarmapsto{abc}
$\xrightarrow{abc}$	\xvarcirclerightarrow{abc}	$\xleftarrow{abc}$	\xvarRibbonleftarrow{abc}
$\xleftarrow{abc}$	\xvardoubleleftarrow{abc}	$\xRightarrow{abc}$	\xvarRibbonrightarrow{abc}
$\xrightarrow{abc}$	\xvardoublerightarrow{abc}	$\xRightarrow{abc}$	\xvarRightarrow{abc}
$\xleftarrow{abc}$	\xvardownhookleftarrow{abc}	$\xrightarrow{abc}$	\xvarrightarrow{abc}
$\xhookrightarrow{abc}$	\xvardownhookrightarrow{abc}	$\xRightarrow{abc}$	\xvarrightarrows{abc}
$\xleftarrow{abc}$	\xvarleftarrow{abc}	$\xrightleftarrows{abc}$	\xvarrightleftarrows{abc}
$\xLeftarrow{abc}$	\xvarLeftarrow{abc}	$\xRightarrow{abc}$	\xvarRrightarrow{abc}
$\xleftarrow{abc}$	\xvarleftarrows{abc}	$\xleftarrow{abc}$	\xvarSquareleftarrow{abc}
$\xleftrightarrow{abc}$	\xvarleftrightarrow{abc}	$\xRightarrow{abc}$	\xvarSquarerightarrow{abc}
$\xleftrightarrows{abc}$	\xvarleftrightarrows{abc}	$\xleftarrow{abc}$	\xvaruphookleftarrow{abc}
$\xLleftarrow{abc}$	\xvarLleftarrow{abc}	$\xhookrightarrow{abc}$	\xvaruphookrightarrow{abc}

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

Table 294: extpfeil Extensible Arrows

$\xlongequal{abc}$	\xlongequal{abc}	$\xtwoheadleftarrow{abc}$	\xtwoheadleftarrow{abc}
$\xmapsto{abc}$	\xmapsto{abc}	$\xtwoheadrightarrow{abc}$	\xtwoheadrightarrow{abc}
$\xtofrom{abc}$	\xtofrom{abc}		

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

Table 295: DotArrow Extensible Arrows

$\dotarrow{a}$	\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 296: halloweenmath Extensible Arrows

$\overscriptleftarrow{abc}$	`\overscriptleftarrow{abc}`	$\underscriptleftarrow{abc}$	`\underscriptleftarrow{abc}`
$\overscriptleftrightarrow{abc}$	`\overscriptleftrightarrow{abc}`	$\underscriptleftrightarrow{abc}$	`\underscriptleftrightarrow{abc}`
$\overscriptrightarrow{abc}$	`\overscriptrightarrow{abc}`	$\underscriptrightarrow{abc}$	`\underscriptrightarrow{abc}`

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

$\overrightarrow{abc}$ `\overrightarrow{abc}` vs. $\overscriptrightarrow{abc}$ `\overscriptrightarrow{abc}`

Table 297: pdfMsym Extensible Harpoons

$\xvarleftharp{abc}$	`\xvarleftharp{abc}`	$\xvarrightharp{abc}$	`\xvarrightharp{abc}`
$\xvarleftrightharp{abc}$	`\xvarleftrightharp{abc}`	$\xvarrightleftharp{abc}$	`\xvarrightleftharp{abc}`

pdfMsym symbols are implemented with PDF literals instead of (or sometimes in conjunction) with a font. All symbols can be rendered by pdfLaTeX and LuaLaTeX, some by XeLaTeX, and none by most other TeX backends.

Table 298: harpoon Extensible Harpoons

$\overleftharp{abc}$	`\overleftharp{abc}`	$\overrightharpdown{abc}$	`\overrightharpdown{abc}`	$\underrightharp{abc}$	`\underrightharp{abc}`
$\overleftharpdown{abc}$	`\overleftharpdown{abc}`	$\underleftharp{abc}$	`\underleftharp{abc}`	$\underrightharpdown{abc}$	`\underrightharpdown{abc}`
$\overrightharp{abc}$	`\overrightharp{abc}`	$\underleftharpdown{abc}$	`\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 299: trfsigns Extensible Transform Symbols

$\dft{abc}$	`\dft{abc}`	$\DFT{abc}$	`\DFT{abc}`

Table 300: esrelation Extensible Relations

$\overleftarrow{\lceil abc \rceil}$	`\relationleftproject{abc}`	$\overrightarrow{\lceil abc \rceil}$	`\relationrightproject{abc}`
$\underline{\lfloor abc \rfloor}$	`\relationlifting{abc}`		

Table 301: halloweenmath Extensible Brooms and Pitchforks

$\overleftarrow{abc}$	`\overleftbroom{abc}`	$\underrightarrow{abc}$	`\underrightbroom{abc}`
$\overleftarrow{abc}$	`\overleftpitchfork{abc}`	$\underrightarrow{abc}$	`\underrightpitchfork{abc}`
$\overrightarrow{abc}$	`\overrightbroom{abc}`	$\xleftarrow{abc}$	`\xleftbroom{abc}`
$\overrightarrow{abc}$	`\overrightpitchfork{abc}`	$\xleftarrow{abc}$	`\xleftpitchfork{abc}`
$\underleftarrow{abc}$	`\underleftbroom{abc}`	$\xrightarrow{abc}$	`\xrightbroom{abc}`
$\underleftarrow{abc}$	`\underleftpitchfork{abc}`	$\xrightarrow{abc}$	`\xrightpitchfork{abc}`

Table 302: halloweenmath Extensible Witches

	\overleftwitchonbroom{abc}		\underrightwitchonbroom{abc}
	\overleftwitchonbroom*{abc}		\underrightwitchonbroom*{abc}
	\overleftwitchonpitchfork*{abc}		\underrightwitchonpitchfork*{abc}
	\overleftwitchonpitchfork{abc}		\underrightwitchonpitchfork{abc}
	\overrightwitchonbroom*{abc}		\xleftwitchonbroom*{abc}
	\overrightwitchonbroom{abc}		\xleftwitchonbroom{abc}
	\overrightwitchonpitchfork*{abc}		\xleftwitchonpitchfork*{abc}
	\overrightwitchonpitchfork{abc}		\xleftwitchonpitchfork{abc}
	\underleftwitchonbroom{abc}		\xrightwitchonbroom{abc}
	\underleftwitchonbroom*{abc}		\xrightwitchonbroom*{abc}
	\underleftwitchonpitchfork*{abc}		\xrightwitchonpitchfork{abc}
	\underleftwitchonpitchfork{abc}		\xrightwitchonpitchfork*{abc}

Table 303: halloweenmath Extensible Ghosts

	\overleftswishingghost{abc}		\overrightswishingghost{abc}
	\underleftswishingghost{abc}		\underrightswishingghost{abc}
	\xleftswishingghost{abc}		\xrightswishingghost{abc}

Table 304: halloweenmath Extensible Bats

	\overleftflutteringbat{abc}		\overrightflutteringbat{abc}
	\underleftflutteringbat{abc}		\underrightflutteringbat{abc}
	\xleftflutteringbat{abc}		\xrightflutteringbat{abc}

Table 305: holtpolt Non-commutative Division Symbols

$\left\lfloor \frac{abc}{def} \right\rceil$	`\holter{abc}{def}`	$\left\lceil \frac{abc}{def} \right\rfloor$	`\polter{abc}{def}`

Table 306: Dots

$\cdotp$	`\cdotp`	:	`\colon`*	.	`\ldotp`	$\vdots$	`\vdots`†
$\cdots$	`\cdots`	$\ddots$	`\ddots`†	...	`\ldots`		

* While ":" is valid in math mode, `\colon` uses different surrounding spacing. See Section 12.4 and the Short Math Guide for LaTeX [Dow00] for more information on math-mode spacing.

† The mathdots package redefines `\ddots` and `\vdots` (Table 312) to make them scale properly with font size. (They normally scale horizontally but not vertically.) `\fixedddots` and `\fixedvdots` provide the original, fixed-height functionality of LaTeX 2$_\varepsilon$'s `\ddots` and `\vdots` macros.

Table 307: $\mathcal{AMS}$ Dots

$\because$	`\because`*	$\cdots$	`\dotsi`	$\therefore$	`\therefore`*
$\cdots$	`\dotsb`	$\cdots$	`\dotsm`		
...	`\dotsc`	...	`\dotso`		

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

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

Table 308: wasysym Dots

$\therefore$	`\wasytherefore`

Table 309: MnSymbol Dots

$\cdot$	`\cdot`	$\cdot\cdot$	`\hdotdot`	$\cdot\cdot\cdot$	`\udots`
$\ddots$	`\ddotdot`	$\cdots$	`\hdots`	$\therefore$	`\uptherefore`
$\ddots$	`\ddots`	$\cdot:$	`\lefttherefore`	$:$	`\vdotdot`
$\diamondddots$	`\diamonddots`	$:\cdot$	`\righttherefore`	$\vdots$	`\vdots`
$\because$	`\downtherefore`	$::$	`\squaredots`		
$\fivedots$	`\fivedots`	$\cdot\cdot$	`\udotdot`		

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

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

Table 310: fdsymbol Dots

$\cdot$	`\cdot`	$\cdots$	`\hdots`	$\cdot\cdot\cdot$	`\udots`
$\ddots$	`\ddotdot`	$\cdot:$	`\lefttherefore`	$\therefore$	`\uptherefore`
$\ddots$	`\ddots`	$:\cdot$	`\righttherefore`	$:$	`\vdotdot`
$\because$	`\downtherefore`	$::$	`\squaredots`		
$\cdot\cdot$	`\hdotdot`	$\cdot\cdot$	`\udotdot`		

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

Table 311: stix Dots

$\cdot\cdot\cdot$	`\adots`	$\cdots$	`\cdots`	$\vdots$	`\fourvdots`
$\because$	`\because`	$::$	`\Colon`	$.$	`\ldotp`
$\cdot$	`\cdot`	$\ddots$	`\ddots`	$\ldots$	`\mathellipsis`
$\cdot$	`\cdotp`	$..$	`\enleadertwodots`	$\therefore$	`\therefore`

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

Table 312: mathdots Dots

⋱	`\ddots`	⋰	`\iddots`	⋮	`\vdots`

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

Table 313: yhmath Dots

⋰	`\adots`

Table 314: teubner Dots

:	`\:`	⋮	`\;`	⁞	`\?`	::	`\antilabe`

Table 315: logix Dots

·	`\BndDot`	:	`\Cln`	…	`\LDots`	∴	`\Thus`
⋯	`\CDots`	.	`\Dt`	∵	`\Since`	⁝	`\VDots`

logix requires either LuaLaTeX or XeLaTeX.

Table 316: begriff Begriffsschrift Symbols

⊢	`\BGassert`	–	`\BGcontent`	¬	`\BGnot`

$\begin{matrix} b \\ a \end{matrix}$	`\BGconditional{a}{b}`	$\overbrace{a}$	`\BGquant{a}`		

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

Table 317: frege Begriffsschrift Symbols

⊢—	\Facontent	⊢╥—	\Fanncontent	—┬—	\Fncontent
⊢┬—	\Fancontent	——	\Fcontent	—╥—	\Fnncontent

⊢╥a—	\Fannquant{a}	⊢a—	\Faquant{a}	—┬a—	\Fnquant{a}
⊢╥a┬	\Fannquantn{a}	⊢a┬	\Faquantn{a}	—┬a┬	\Fnquantn{a}
⊢╥a╥	\Fannquantnn{a}	⊢a╥	\Faquantnn{a}	—┬a╥	\Fnquantnn{a}
⊢┬a—	\Fanquant{a}	—╥a—	\Fnnquant{a}	—a┬	\Fquantn{a}
⊢┬a┬	\Fanquantn{a}	—╥a┬	\Fnnquantn{a}	—a╥	\Fquantnn{a}
⊢┬a╥	\Fanquantnn{a}	—╥a╥	\Fnnquantnn{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 318: mathcomp Math Symbols

℃	\tccentigrade	Ω	\tcohm	‰	\tcperthousand
µ	\tcmu	‱	\tcpertenthousand		

Table 319: marvosym Math Symbols

∢	\AngleSign	≥	\LargerOrEqual	×	\MVMultiplication
⇒	\Conclusion	≤	\LessOrEqual	.	\MVPeriod
≡	\Congruent	·	\MultiplicationDot	+	\MVPlus
≙	\Corresponds	,	\MVComma	→	\MVRightArrow
⁄	\Divides	/	\MVDivision	)	\MVRightBracket
⁄̸	\DividesNot	(	\MVLeftBracket	≢	\NotCongruent
⇔	\Equivalence	-	\MVMinus		

Table 320: marvosym Digits

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

Table 321: fge Digits

ↁ	\fgeleftthree	ↂ	\fgerighttwo	0	\fgestruckzero
↋	\fgelefttwo	1	\fgestruckone		

Table 322: dozenal Base-12 Digits

↊	\x	↋	\e

Table 323: mathabx Mayan Digits

𝋀	\maya{0}	⁚	\maya{2}	⁞	\maya{4}
·	\maya{1}	⁝	\maya{3}	❙	\maya{5}

Table 324: stix Infinities

⊗	\acidfree	∞	\infty	⧜	\tieinfty
∾	\iinfin	⧞	\nvinfty		

Table 325: stix Primes

′	\prime	‵	\backprime
″	\dprime	‶	\backdprime
‴	\trprime	‷	\backtrprime
⁗	\qprime		

Table 326: stix Empty Sets

∅	\emptyset	⦱	\emptysetobar	⦰	\varnothing
⦳	\emptysetoarr	⦲	\emptysetocirc		
⦴	\emptysetoarrl	⦸	\revemptyset		

Table 327: $\mathcal{AMS}$ Angles

∠	\angle	∡	\measuredangle	⊾	\sphericalangle

Table 328: MnSymbol Angles

∠	\angle	∡	\measuredangle	⊾	\sphericalangle

Table 329: fdsymbol Angles

∠	\angle	⦡	\revangle	⦟	\sphericalangle
⦟	\measuredangle	⦥	\revmeasuredangle	⦢	\sphericalangledown
⊾	\measuredrightangle	∟	\rightangle	⦠	\sphericalangleleft
⊾	\measuredrightangledot	⊾	\rightanglesquare	∀	\sphericalangleup

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

Table 330: boisik Angles

∠	\angle	∟	\rightangle	⦟	\sphericalangle
⦟	\measuredangle	⊾	\rightanglemdot		
⊾	\measuredrightangle	⊾	\rightanglesqr		

Table 331: stix Angles

⦛	\angdnr	⦩	\measanglerutone	⊾	\rightanglemdot
∠	\angle	⦪	\measangleultonw	⊾	\rightanglesqr
⦣	\angles	⦫	\measangleurtone	⦟	\sphericalangle
⦤	\angleubar	⦡	\measuredangle	∀	\sphericalangleup
⦠	\gtlpar	⦥	\measuredangleleft	⦜	\threedangle
⦨	\measangledltosw	⊾	\measuredrightangle	⦝	\turnangle
⦥	\measangledrtose	⦱	\rangledownzigzagarrow	⦢	\wideangledown
⦧	\measangleldtosw	⦡	\revangle	⦣	\wideangleup
⦦	\measanglelutonw	⦤	\revangleubar		
⦪	\measanglerdtose	∟	\rightangle		

Table 332: typicons Decorative Mathematical Symbols

÷	\tiDivide	∞	\tiInfinity	π	\tiPi
⨸	\tiDivideOutline	∞	\tiInfinityOutline	+	\tiPlus
=	\tiEquals	−	\tiMinus	⨹	\tiPlusOutline
⩵	\tiEqualsOutline	−	\tiMinusOutline		

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

typicons requires either LuaLaTeX or XeLaTeX.

Table 333: fontawesome5 Decorative Mathematical Symbols

÷	\faDivide	<	\faLessThan	%	\faPercentage
=	\faEquals	≤	\faLessThanEqual	+	\faPlus
>	\faGreaterThan	−	\faMinus	?	\faQuestion
≥	\faGreaterThanEqual	≠	\faNotEqual		
∞	\faInfinity	%	\faPercent		

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

Table 334: Miscellaneous LaTeX 2_ε Math Symbols

ℵ	\aleph	□	\Box*,†	∇	\nabla	△	\triangle
∅	\emptyset‡	◇	\Diamond*	¬	\neg		
∠	\angle	∞	\infty	′	\prime		
\	\backslash	℧	\mho*	√	\surd		

* Not predefined in LaTeX 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 $\mathcal{AMS}$'s \varnothing ("∅", Table 335) to that of LaTeX's \emptyset.

Table 335: Miscellaneous $\mathcal{AMS}$ Math Symbols

‵	\backprime	▼	\blacktriangledown	℧	\mho
★	\bigstar	╲	\diagdown	□	\square
⧫	\blacklozenge	╱	\diagup	▽	\triangledown
■	\blacksquare	ð	\eth	∅	\varnothing
▲	\blacktriangle	◊	\lozenge	△	\vartriangle

Table 336: Miscellaneous wasysym Math Symbols

□	\Box	◇	\Diamond	℧	\mho*	∢	\varangle

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

Table 337: Miscellaneous txfonts/pxfonts Math Symbols

◆	\Diamondblack	ƛ	\lambdabar
◈	\Diamonddot	ƛ	\lambdaslash

Table 338: Miscellaneous mathabx Math Symbols

○	\degree	⁗	\fourth	∡	\measuredangle	″	\second
⧹	\diagdown	#	\hash	⫛	\pitchfork	∢	\sphericalangle
⧸	\diagup	∞	\infty	∝	\propto	‴	\third
∅	\diameter	⋉	\leftthreetimes	⋋	\rightthreetimes	#	\varhash

Table 339: Miscellaneous MnSymbol Math Symbols

⌐	\backneg	∅	\diameter	¬	\invneg	¬	\neg
∖	\backprime	∞	\infty	✠	\maltese	′	\prime
✓	\checkmark	⌙	\invbackneg	∇	\nabla	∫	\smallint

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

Table 340: Miscellaneous Internal MnSymbol Math Symbols

⋯	\partialvardint	⋯	\partialvartint
⌣	\partialvardlanddownint	⌣	\partialvartlanddownint
⌢	\partialvardlandupint	⌢	\partialvartlandupint
↺	\partialvardlcircleleftint	↺	\partialvartlcircleleftint
↻	\partialvardlcirclerightint	↻	\partialvartlcirclerightint
⬭	\partialvardoiint	⬭	\partialvartoiint
○	\partialvardoint	○	\partialvartoint
↺	\partialvardrcircleleftint	↺	\partialvartrcircleleftint
↻	\partialvardrcirclerightint	↻	\partialvartrcirclerightint
⨍	\partialvardstrokedint	⨍	\partialvartstrokedint
∑	\partialvardsumint	Σ	\partialvartsumint

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

Table 341: Miscellaneous fdsymbol Math Symbols

⌐	\backneg	⨝	\intprod	′	\prime
‵	\backprime	⨞	\intprodr	⦰	\revemptyset
✓	\checkmark	⌐	\invneg	▽	\sector
∅	\emptyset	✠	\maltese	⨍	\smallint
∞	\infty	¬	\neg		

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

Table 342: Miscellaneous boisik Math Symbols

϶	\backepsilon	⊹	\hermitmatrix	∠	\notbot
‵	\backprime	∾	\iinfin	⅂	\nottop
✓	\checkmark	⌐	\invnot	ι	\riota
□	\dalambert	ƛ	\lambdabar	∼	\sinewave
╲	\diagdown	ƛ	\lambdaslash	∅	\varnothing
╱	\diagup	✠	\maltese		

Table 343: Miscellaneous stix Math Symbols

⏦	\accurrent	⊹	\hermitmatrix	⏤	\PropertyLine
\	\backslash	▪	\hyphenbullet	∎	\QED
⫲	\bbrktbrk	⦚	\hzigzag	⁇	\Question
⊥	\bigbot	Δ	\increment	⨯	\rdiagovfdiag
⫼	\biginterleave	◘	\inversebullet	⋉	\rightouterjoin
⊤	\bigtop	⌐	\invnot	⌟	\sansLmirrored
☻	\blacksmiley	⋈	\Join	⌝	\sansLturned
∣	\bracevert	□	\laplac	∿	\sinewave
^	\caretinsert	⋊	\leftouterjoin	—	\strns
✓	\checkmark	◟	\llarc	‡	\thermod
⩤	\conictaper	◞	\lrarc	⍧	\topcir
⩇	\danger	✠	\maltese	⌙	\turnednot
╲	\diagdown	§	\mathsection	⏟	\ubrbrak
╱	\diagup	␣	\mathvisiblespace	◜	\ularc
⌀	\diameter	∇	\nabla	◝	\urarc

(continued on next page)

(continued from previous page)

✻	`\dingasterisk`	¬	`\neg`*	#	`\viewdata`
⋊	`\elinters`	⌒	`\obrbrak`	⦚	`\vzigzag`
ð	`\eth`	⊥s	`\perps`	¥	`\yen`
‼	`\Exclam`	⊤	`\postalmark`	⨾	`\zcmp`
╳	`\fdiagovrdiag`	⌒	`\profline`	≫	`\zpipe`
⟗	`\fullouterjoin`	⌓	`\profsurf`	⌈	`\zproject`

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

Table 344: Miscellaneous textcomp Text-mode Math Symbols

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

* If you prefer a larger degree symbol you might consider defining one as "`\ensuremath{^\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 345: Miscellaneous fge Math Symbols

\	`\fgebackslash`	⌒	`\fgecap`	⌣́	`\fgecupacute`	⌜	`\fgelangle`
⌣́	`\fgebaracute`	⌓	`\fgecapbar`	⌣̄	`\fgecupbar`	⌟	`\fgeupbracket`
⌒̄	`\fgebarcap`	⌣	`\fgecup`	⌓	`\fgeinfty`		

Table 346: Miscellaneous mathdesign Math Symbols

∟	`\rightangle`

Table 347: Miscellaneous logix Math Symbols

⊗	\Aor	⊗	\FncCnvrs	⊔	\MapJoin	∪	\SetJoin
⤚	\Append	∘	\FncComp	⊓	\MapMeet	∩	\SetMeet
⥉	\BncBistab	•	\ForComp	⊕	\Mnd	△	\SetSymDiff
⊔	\BnchJoin	ω	\FrstOrd	⥀	\Mor	⫠	\SimPerp
⊓	\BnchMeet	ν	\GrtFix	◁	\Normal	⌣	\SInCoh
⫩	\Catenate	≍	\InCoh	?	\OfCrse	⊕	\SmCircPlus
⊤	\Choice	∞	\Infin	&	\QuantAAnd	⊛	\SmCircStar
⊺	\Choices	⥈	\LcgBistab	⨆	\QuantBnchJoin	⊗	\SmCircTimes
⌔	\Coh	⨁	\LgCircPlus	⨅	\QuantBnchMeet	⫫	\VeeJoin
‖	\Concat	⊛	\LgCircStar	⥁	\QuantMor	⫪	\VeeMeet
≺	\Cover	⊗	\LgCircTimes	⋃	\QuantSetJoin	!	\WhyNot
$\vec{\nu}$	\ExGrtFix	μ	\LstFix	⋂	\QuantSetMeet		
$\vec{\mu}$	\ExLstFix	▫	\MapComp	⌢	\SCoh		

logix requires either LuaLaTeX or XeLaTeX.

Table 348: Math Alphabets

Font sample	Generating command	TEX font	Required package
ABCdef123	`\mathrm{ABCdef123}`	`cmr10`	*none*
$ABCdef123$	`\mathit{ABCdef123}`	`cmmi10`	*none*
$ABCdef123$	`\mathnormal{ABCdef123}`	`cmmi10`	*none*
$\mathcal{ABC}$	`\mathcal{ABC}`	`cmsy10`	*none*
$\mathscr{ABC}$	`\mathscr{ABC}`	`rsfs10`	mathrsfs
or	`\mathcal{ABC}`	`rsfs10`	calrsfs
$\mathcal{ABC}$	`\mathcal{ABC}`	`eusm10`	euscript with the mathcal option
or	`\mathscr{ABC}`	`eusm10`	euscript with the mathscr option
$\mathscr{ABC}$	`\mathcal{ABC}`	`rsfso10`	rsfso
or	`\mathscr{ABC}`	`rsfso10`	rsfso with the scr option
$\mathcal{ABC}$	`\mathcal{ABC}`	`urwchancal`	urwchancal*
or	`\mathscr{ABC}`	`urwchancal`	urwchancal* with the mathscr option
$\mathbb{ABC}$	`\mathbb{ABC}`	`msbm10`	amsfonts,§ amssymb, txfonts, or pxfonts
$\mathbf{\mathbb{ABC}}$	`\varmathbb{ABC}`	`txmia`	txfonts or pxfonts
$\mathbb{ABC}def123$	`\mathbb{ABCdef123}`	`bbold10`	bbold or mathbbol†
$\mathbb{ABC}def123$	`\mathbb{ABCdef123}`	`mbb10`	mbboard†
$\mathbb{ABC}def12$	`\mathbbm{ABCdef12}`	`bbm10`	bbm
$\mathbb{ABC}def12$	`\mathbbmss{ABCdef12}`	`bbmss10`	bbm
$\mathbb{ABC}def12$	`\mathbbmtt{ABCdef12}`	`bbmtt10`	bbm
$\mathbb{ABC}1$	`\mathds{ABC1}`	`dsrom10`	dsfont
$\mathbf{\mathbb{ABC}1}$	`\mathds{ABC1}`	`dsss10`	dsfont with the sans option
$\mathbb{ABC}def123$	`\mathbb{ABCdef123}`	`DSSerif`	dsserif
$\mathbf{\mathbb{ABC}def123}$	`\mathbbb{ABCdef123}`	`DSSerif-Bold`	dsserif
$\mathbb{ABC}$	`\symA\symB\symC`	`china10`	GhiNA2e‡
$\mathfrak{ABC}def123$	`\mathfrak{ABCdef123}`	`eufm10`	eufrak
$\mathfrak{ABC}def123$	`\textfrak{ABCdef123}`	`yfrak`	yfonts¶
$\mathfrak{ABC}def123$	`\textswab{ABCdef123}`	`yswab`	yfonts¶
$\mathfrak{ABC}def123$	`\textgoth{ABCdef123}`	`ygoth`	yfonts¶

The "TEX font" column lists the underlying TEX font (or, more accurately, the `.tfm` file) that provides the math alphabet. See the corresponding table in the associated Raw Font Tables document for the math alphabet's complete character set.

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

  As a similar trick, you can typeset the Calligra font's script "$\mathcalligra{z}$" (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, "$\mathbb{\Langle\Lbrack\Lparen\bbalpha\bbbeta\bbgamma\Rparen\Rbrack\Rangle}$" is produced by "`\mathbb{\Langle\Lbrack\Lparen\bbalpha\bbbeta\bbgamma\Rparen\Rbrack\Rangle}`".

  mbboard extends the blackboard bold symbol set significantly further. It supports not only the Greek alphabet—including "Greek-like" symbols such as `\bbnabla` ("$\mathbb{\nabla}$")—but also *all* punctuation marks, various currency symbols such as `\bbdollar` ("$\mathbb{\$}$") and `\bbeuro` ("$\mathbb{€}$"), and the Hebrew alphabet (e.g., "`\bbfinalnun\bbyod\bbqof\bbpe`" → "$\mathbb{\text{ן}\text{י}\text{ק}\text{ף}}$").

‡ The `\sym...` commands provided by the LaTeX 2e package are actually text-mode commands. They are included in Table 348 because they resemble the blackboard-bold symbols that appear in the rest of the table. In addition to the 26 letters of the English alphabet, LaTeX 2e provides three umlauted blackboard-bold letters: `\symAE` ("$\mathbb{\text{Ä}}$"), `\symOE` ("$\mathbb{\text{Ö}}$"), and `\symUE` ("$\mathbb{\text{Ü}}$"). Note that LaTeX 2e does provide math-mode commands for the most common number-set symbols. These are presented in Table 207 on page 119.

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

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

Chapter 4

Science and technology symbols

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

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

℃	`\celsius`	µ	`\micro`	‰	`\perthousand`
°	`\degree`	Ω	`\ohm`		

Table 350: wasysym Electrical and Physical Symbols

∼	`\AC`	≋	`\VHF`	∿∿∿	`\photon`	≈	`\HF`	◠◡◠◡◠◡◠	`\gluon`

Table 351: ifsym Pulse Diagram Symbols

⌝	`\FallingEdge`	⌝⌟⌜	`\LongPulseLow`	⌝⌜	`\PulseLow`	⌟⌞	`\ShortPulseHigh`
⌟⌜⌟	`\LongPulseHigh`	⌟⌞	`\PulseHigh`	⌟	`\RaisingEdge`	⌜	`\ShortPulseLow`

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

_	l	¯	m	‾	h	‗	d	〈	<	〉	>
__	L	¯¯	M	‾‾	H	‗‗	D	〈	<<	〉	>>

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

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

Table 352: ar Aspect Ratio Symbol

$\mathcal{AR}$ `\AR`

Table 353: plimsoll Plimsoll Symbol

$\ominus$ `\plimsoll`

Table 354: textcomp Text-mode Science and Engineering Symbols

℃ `\textcelsius` ℧ `\textmho` µ `\textmu` Ω `\textohm`

Table 355: steinmetz Extensible Phasor Symbol

$\underline{/abc}$ `\phase{abc}`

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

Table 356: emf Electromotive Force Symbols

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

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

Table 357: wasysym Astronomical Symbols

☿	\mercury	♁	\earth	♃	\jupiter	♅	\uranus	♇	\pluto
♀	\venus	♂	\mars	♄	\saturn	♆	\neptune		
⊙	\astrosun	○	\fullmoon	☾	\leftmoon	●	\newmoon	☽	\rightmoon
♈	\aries	♋	\cancer	♎	\libra	≈	\aquarius		
♉	\taurus	♌	\leo	♏	\scorpio	♑	\capricornus		
♊	\gemini	♍	\virgo	➶	\sagittarius	♓	\pisces		
☊	\ascnode	☋	\descnode	☌	\conjunction	☍	\opposition	♈	\vernal

Table 358: 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 359: mathabx Astronomical Symbols

☿	\Mercury	⊕	\Earth	♃	\Jupiter	♅	\Uranus	♇	\Pluto
♀	\Venus	♂	\Mars	♄	\Saturn	♆	\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 360: stix Astronomical Symbols

⊙	\astrosun	☾	\leftmoon	☽	\rightmoon	☼	\sun

Table 361: utfsym Astronomical Symbols

⊙	\usym{2609}	♅	\usym{2643}	♏	\usym{264F}	◍	\usym{1F318}
♋	\usym{260A}	♄	\usym{2644}	♐	\usym{2650}	◗	\usym{1F319}
♍	\usym{260B}	♆	\usym{2645}	♑	\usym{2651}	●	\usym{1F31A}
♌	\usym{260C}	♆	\usym{2646}	♒	\usym{2652}	◖	\usym{1F31B}
♎	\usym{260D}	♇	\usym{2647}	♓	\usym{2653}	☾	\usym{1F31C}
☼	\usym{263C}	♈	\usym{2648}	●	\usym{1F311}	☾	\usym{1F31D}
☽	\usym{263D}	♉	\usym{2649}	◍	\usym{1F312}	☼	\usym{1F31E}
☾	\usym{263E}	♊	\usym{264A}	◐	\usym{1F313}	★	\usym{1F31F}
☿	\usym{263F}	♋	\usym{264B}	○	\usym{1F314}	☄	\usym{1F320}
♀	\usym{2640}	♌	\usym{264C}	○	\usym{1F315}		
♁	\usym{2641}	♍	\usym{264D}	◑	\usym{1F316}		
♂	\usym{2642}	♎	\usym{264E}	◑	\usym{1F317}		

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

Table 362: starfont Astronomical Symbols

☿	\Mercury	♂	\Mars	♅	\Uranus	♁	\varTerra
♀	\Venus	♃	\Jupiter	♆	\Neptune	♢	\varUranus
⊕	\Terra	♄	\Saturn	♇	\Pluto	♇	\varPluto
☉	\Sun	☽	\Moon	☾	\varMoon		
⚳	\Cupido	⚷	\Zeus	⚶	\Apollon	⚻	\Vulkanus
⚸	\Hades	⚵	\Kronos	⚺	\Admetos	⚹	\Poseidon
⚸	\Lilith	☊	\NorthNode	☋	\SouthNode		
⚱	\Amor	⚴	\Eros	⚵	\Juno	⚘	\Sappho
⚳	\Ceres	⚌	\Hidalgo	⚴	\Pallas	⚶	\Vesta
⚷	\Chiron	⚕	\Hygiea	⚵	\Psyche		
⊗	\Fortune						
♈	\Aries	♌	\Leo	♐	\Sagittarius	♑	\varCapricorn
♉	\Taurus	♍	\Virgo	♑	\Capricorn		
♊	\Gemini	♎	\Libra	♒	\Aquarius		
♋	\Cancer	♏	\Scorpio	♓	\Pisces		
☌	\Conjunction	□	\Square	⚺	\Semisextile		
☍	\Opposition	⚹	\Sextile	∠	\Semisquare		
△	\Trine	⚻	\Quincunx	⚼	\Sesquiquadrate		
A^{SC}	\ASC	E^{P}	\EastPoint	M^{C}	\MC		
D^{SC}	\DSC	I^{C}	\IC	V^{X}	\Vertex		
D^{t}	\Direct	R_{x}	\Retrograde	S^{t}	\Station		
⚠	\Air	▽	\Earth	△	\Fire	▽	\Water
N^{tl}	\Natal	☆	\Pentagram	R^{ad}	\Radix		

Table 363: wasysym APL Symbols

⍞	\APLbox	⍤	\APLinv	⋆	\APLstar
⍝	\APLcomment	⍇	\APLleftarrowbox	△	\APLup
▽	\APLdown	⍟	\APLlog	⍐	\APLuparrowbox
⍗	\APLdownarrowbox	¯	\APLminus	⍀	\notbackslash
⍞	\APLinput	⍈	\APLrightarrowbox	⌿	\notslash
$\circledcirc$	\APLcirc{a}	$\circledcirc$	\APLnot{a}	$\circledcirc$	\APLvert{a}

Table 364: stix APL Symbols

⍰	\APLboxquestion	⍀	\APLnotbackslash
⍓	\APLboxupcaret	⌿	\APLnotslash

Table 365: apl APL Symbols

|	\AB	¨	\DD	⍒	\GD	⊢	\LK	⍕	\PD	↑	\UA	*G*	\ZG	*Q*	\ZQ
⍺	\AM	⊥	\DE	≥	\GE	○	\LO	⍞	\QQ	_	\US	*H*	\ZH	*R*	\ZR
\	\BL	∇	\DL	→	\GO	⊃	\LU	}	\RB	∪	\UU	*I*	\ZI	*S*	\ZS
⍁	\BX	◇	\DM	⍋	\GU	≠	\NE	⊣	\RK	⍦	\XQ	*J*	\ZJ	*T*	\ZT
⍀	\CB	⍇	\DQ	⍳	\IB	¯	\NG	⍴	\RO	*A*	\ZA	*K*	\ZK	*U*	\ZU
⌈	\CE	∩	\DU	⍵	\IO	⍲	\NN	⊂	\RU	*B*	\ZB	*L*	\ZL	*V*	\ZV
⍄	\CO	⊤	\EN	{	\LB	⍱	\NR	⍬	\RV	*C*	\ZC	*M*	\ZM	*W*	\ZW
⍥	\CR	∈	\EP	⍙	\LD	~	\NT	∘	\SO	*D*	\ZD	*N*	\ZN	*X*	\ZX
⍁	\CS	⌊	\FL	≤	\LE	⍵	\OM	⊆	\SS	*E*	\ZE	*O*	\ZO	*Y*	\ZY
↓	\DA	⍭	\FM	⍟	\LG	∨	\OR	⍉	\TR	*F*	\ZF	*P*	\ZP	*Z*	\ZZ

Table 366: marvosym Computer Hardware Symbols

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

Table 367: keystroke Computer Keys

Alt	\Alt	Enter	\Enter*	PrtSc	\PrtSc*
AltGr	\AltGr	Esc	\Esc*	→	\RArrow
Break	\Break*	Home	\Home*	↩	\Return
⟵	\BSpace†	Ins	\Ins*	Scroll	\Scroll*
Ctrl	\Ctrl*	←	\LArrow	Shift ⇑	\Shift*
↓	\DArrow	Num	\NumLock		\Spacebar
Del	\Del*	Page ↓	\PgDown*	⇆	\Tab†
End	\End*	Page ↑	\PgUp*	↑	\UArrow

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

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

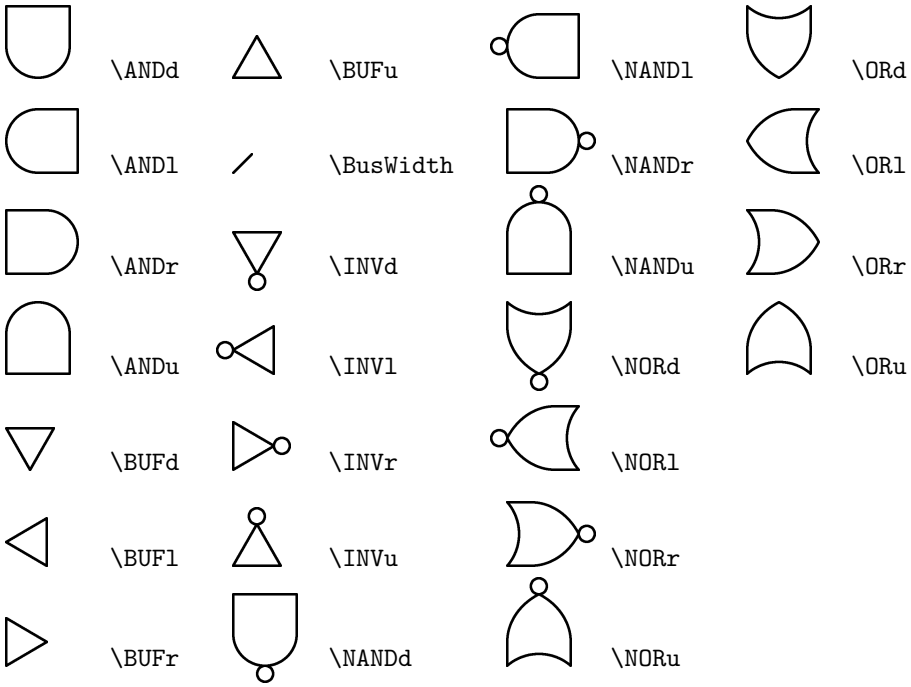
The \keystroke command draws a key with an arbitrary label. For example, "\keystroke{F7}" produces " F7 ".

Table 368: ascii Control Characters (CP437)

☺	\SOH	◘	\BS	☼	\SI	▬	\SYN	↔	\GS
☻	\STX	○	\HT	►	\DLE	↨	\ETB	▲	\RS
♥	\ETX	◙	\LF	◄	\DCa	↑	\CAN	_	\US
♦	\EOT	♂	\VT	↕	\DCb	↓	\EM		
♣	\ENQ	♀	\FF	‼	\DCc	→	\SUB		
♠	\ACK	♪	\CR	¶	\DCd	←	\ESC		
•	\BEL	◦	\SO	§	\NAK	└	\FS		
⌂	\DEL		\NBSP		\NUL	¦	\splitvert		

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

Table 369: logic Logic Gates



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

Table 370: quantikz Quantum-Mechanics Notation

$\langle a\|$	`\bra{a}`	$\|a\rangle$	`\ket{a}`
$\langle a\|b\rangle$	`\braket{a}{b}`	$\|a\rangle\langle a\|$	`\proj{a}`

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

Table 371: marvosym Communication Symbols

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

Table 372: marvosym Engineering Symbols

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

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

Table 373: typicons User-Interface Symbols

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

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

typicons requires either LuaLaTeX or XeLaTeX.

Table 374: fontawesome5 User-Interface Symbols

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

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

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

Table 375: wasysym Biological Symbols

♀	`\female`	♂	`\male`

Table 376: stix Biological Symbols

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

Table 377: marvosym Biological Symbols

⚫	`\FEMALE`	⚭	`\FemaleMale`	♂	`\Male`	○	`\Neutral`
♀	`\Female`	⚥	`\Hermaphrodite`	⚬	`\MALE`		
⚘	`\FemaleFemale`	⚫	`\HERMAPHRODITE`	⚮	`\MaleMale`		

Table 378: utfsym Biological Symbols

⚘	`\usym{26A2}`	⚥	`\usym{26A4}`	♂	`\usym{26A6}`	⚷	`\usym{26A8}`
⚮	`\usym{26A3}`	⚥	`\usym{26A5}`	⚥	`\usym{26A7}`	⚷	`\usym{26A9}`

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

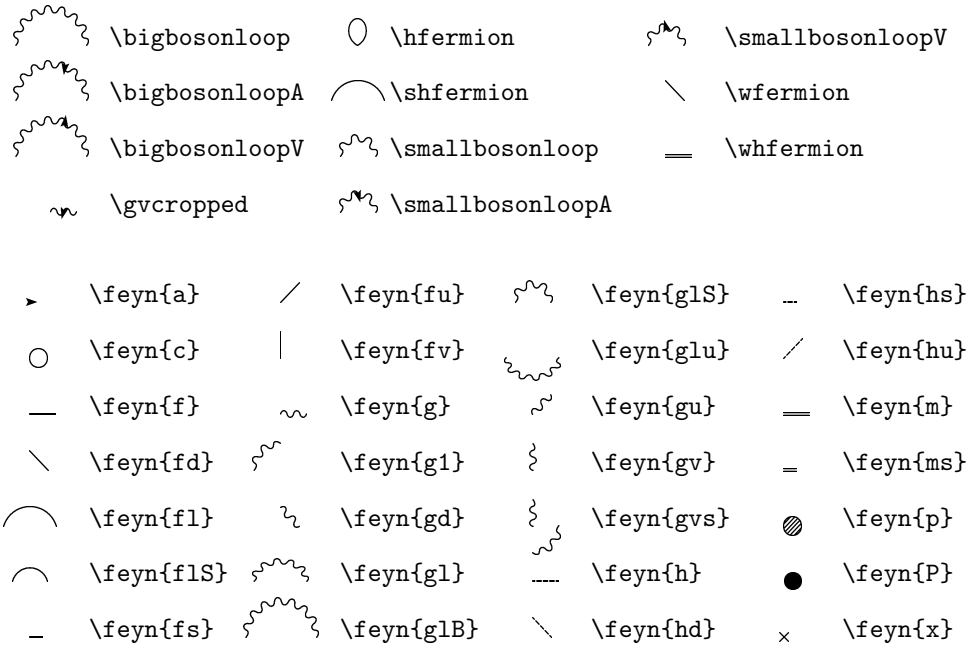
Table 379: fontawesome5 Biological Symbols

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

Table 380: marvosym Safety-related Symbols

☣	`\Biohazard`	CE	`\CEsign`	Ex	`\Explosionsafe`	☢	`\Radioactivity`
⬡	`\BSEfree`	⚠	`\Estatically`	✷	`\Laserbeam`	STOP	`\Stopsign`

Table 381: feyn Feynman Diagram Symbols



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

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

Table 382: svrsymbols Physics Ideograms

	\adsorbate		\experimentalsym		\protein
	\adsorbent		\externalsym	p^+	\proton
μ^+	\antimuon		\fermiDistrib		\quadrupole
$\bar{\nu}$	\antineutrino		\fermion	q	\quark
$\bar{n}$	\antineutron	g	\Gluon	b	\quarkb
p^-	\antiproton		\graphene	c	\quarkc
$\bar{q}$	\antiquark		\graviton	d	\quarkd
$\bar{b}$	\antiquarkb		\hbond	s	\quarks
$\bar{c}$	\antiquarkc		\Higgsboson	t	\quarkt
$\bar{d}$	\antiquarkd	h^+	\hole	u	\quarku
$\bar{s}$	\antiquarks		\interaction	R	\reference
$\bar{t}$	\antiquarkt		\internalsym		\resistivity

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$\bar{u}$	\antiquarku	ⓘ	\ion	ϱ^-	\rhomesonminus
⍲	\anyon	⊕	\ionicbond	ϱ^0	\rhomesonnull
✡	\assumption	Ψ	\Jpsimeson	ϱ^+	\rhomesonplus
⚛	\atom	K^-	\Kaonminus	⊞	\solid
✡	\bigassumption	K^0	\Kaonnull	⚹	\spin
✡	\Bigassumption	K^+	\Kaonplus	⚶	\spindown
✡	\biggassumption	⇝	\magnon	⚵	\spinup
B^-	\Bmesonminus	$\mathfrak{M}$	\maxwellDistrib	⏢	\surface
B^0	\Bmesonnull	M	\metalbond	卌	\svrexample
B^+	\Bmesonplus	$\mathbb{M}$	\method	$\not{f}$	\svrphoton
⟝	\bond	μ^-	\muon	$\not{t}$	\tachyon
)	\boseDistrib	ν	\neutrino	τ^-	\tauleptonminus
)	\boson	n^0	\neutron	τ^+	\tauleptonplus
⊛	\conductivity	⁘	\nucleus	T^-	\Tmesonminus
C	\covbond	⊂	\orbit	T^0	\Tmesonnull
d^p	\dipole	ϕ	\phimeson	T^+	\Tmesonplus
D^-	\Dmesonminus	ϕ^0	\phimesonnull	CCC	\triplecovbond
D^0	\Dmesonnull	$\not{f}$	\phonon	Υ	\Upsilonmeson
D^+	\Dmesonplus	π^-	\pionminus	$\not{\Upsilon}$	\varphoton
CC	\doublecovbond	π^0	\pionnull	⚇	\water
e^-	\electron	π^+	\pionplus	W	\Wboson
Ǝ	\errorsym	e	\plasmon	W^-	\Wbosonminus
η	\etameson	$\not{x}$	\polariton	W^+	\Wbosonplus
η'	\etamesonprime	$\ni\not{f}$	\polaron	Z	\Zboson
$\ni h^+$	\exciton	e^+	\positron		

Chapter 5

Dingbats

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

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

Table 383: bbding Arrows

➥	\ArrowBoldDownRight	➧	\ArrowBoldRightShort	➦	\ArrowBoldUpRight
➲	\ArrowBoldRightCircled	➠	\ArrowBoldRightStrobe		

Table 384: pifont Arrows

➔	\ding{212}	→	\ding{221}	➦	\ding{230}	⇨	\ding{239}	➶	\ding{249}
→	\ding{213}	➙	\ding{222}	➧	\ding{231}	⇨	\ding{241}	➷	\ding{250}
↔	\ding{214}	➛	\ding{223}	➨	\ding{232}	➲	\ding{242}	➸	\ding{251}
↕	\ding{215}	➠	\ding{224}	⇨	\ding{233}	➳	\ding{243}	➹	\ding{252}
↘	\ding{216}	➡	\ding{225}	➪	\ding{234}	➴	\ding{244}	➺	\ding{253}
➙	\ding{217}	➢	\ding{226}	⇨	\ding{235}	➵	\ding{245}	➻	\ding{254}
➚	\ding{218}	➢	\ding{227}	⇦	\ding{236}	➶	\ding{246}		
➛	\ding{219}	➤	\ding{228}	⇨	\ding{237}	➷	\ding{247}		
➜	\ding{220}	➥	\ding{229}	⇨	\ding{238}	➸	\ding{248}		

Table 385: adfsymbols Arrows

↣	\adfarrowe1	↗	\adfarrowne1	↓	\adfarrows1	↙	\adfarrowsw1
→	\adfarrowe2	↗	\adfarrowne2	↓	\adfarrows2	↙	\adfarrowsw2
➙	\adfarrowe3	↗	\adfarrowne3	↓	\adfarrows3	↙	\adfarrowsw3
↣	\adfarrowe4	↗	\adfarrowne4	↓	\adfarrows4	↙	\adfarrowsw4
→	\adfarrowe5	↗	\adfarrowne5	↓	\adfarrows5	↙	\adfarrowsw5
↣	\adfarrowe6	↗	\adfarrowne6	↓	\adfarrows6	↙	\adfarrowsw6
↑	\adfarrown1	↖	\adfarrownw1	↘	\adfarrowse1	←	\adfarroww1
↑	\adfarrown2	↖	\adfarrownw2	↘	\adfarrowse2	←	\adfarroww2
↑	\adfarrown3	↖	\adfarrownw3	↘	\adfarrowse3	←	\adfarroww3
↑	\adfarrown4	↖	\adfarrownw4	↘	\adfarrowse4	←	\adfarroww4
↑	\adfarrown5	↖	\adfarrownw5	↘	\adfarrowse5	←	\adfarroww5
↑	\adfarrown6	↖	\adfarrownw6	↘	\adfarrowse6	←	\adfarroww6

◅	\adfhalfarrowleft	▻	\adfhalfarrowright
◅	\adfhalfarrowleftsolid	▻	\adfhalfarrowrightsolid

Technically, the digit at the end of each \adfarrow⟨*dir*⟩⟨*digit*⟩ command is a macro argument, not part of the command name.

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

Table 386: adforn Arrows

➢	\adfhalfleftarrow	➢	\adfhalfrightarrowhead
◂	\adfhalfleftarrowhead	◂	\adfleftarrowhead
➢	\adfhalfrightarrow	▸	\adfrightarrowhead

Table 387: arev Arrows

➢	\arrowbullet

Table 388: utfsym Arrows

➔	\usym{2794}	➡	\usym{27A1}	⇫	\usym{27AB}	➶	\usym{27B6}
➘	\usym{2798}	➢	\usym{27A2}	⇬	\usym{27AC}	➷	\usym{27B7}
➙	\usym{2799}	➣	\usym{27A3}	⇭	\usym{27AD}	➸	\usym{27B8}
➚	\usym{279A}	➤	\usym{27A4}	⇮	\usym{27AE}	➹	\usym{27B9}
➛	\usym{279B}	➥	\usym{27A5}	⇯	\usym{27AF}	➺	\usym{27BA}
➜	\usym{279C}	➦	\usym{27A6}	⇰	\usym{27B1}	➻	\usym{27BB}
➝	\usym{279D}	➧	\usym{27A7}	⇱	\usym{27B2}	➼	\usym{27BC}
➞	\usym{279E}	➨	\usym{27A8}	⇲	\usym{27B3}	➽	\usym{27BD}
➟	\usym{279F}	➩	\usym{27A9}	⇳	\usym{27B4}	➾	\usym{27BE}
➠	\usym{27A0}	➪	\usym{27AA}	⇴	\usym{27B5}		

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

Table 389: asapsym Arrows

⬇	\asapArrowCircleFillDown	⊖	\asapArrowCircleOpenRight
⬋	\asapArrowCircleFillDownLeft	⊕	\asapArrowCircleOpenUp
⬊	\asapArrowCircleFillDownRight	⊗	\asapArrowCircleOpenUpLeft
⬅	\asapArrowCircleFillLeft	⊘	\asapArrowCircleOpenUpRight
➡	\asapArrowCircleFillRight	↓	\asapArrowDown
⬆	\asapArrowCircleFillUp	↙	\asapArrowDownLeft
⬉	\asapArrowCircleFillUpLeft	↘	\asapArrowDownRight
⬈	\asapArrowCircleFillUpRight	←	\asapArrowLeft
⊛	\asapArrowCircleOpenDown	→	\asapArrowRight
⊙	\asapArrowCircleOpenDownLeft	↑	\asapArrowUp
⊚	\asapArrowCircleOpenDownRight	↖	\asapArrowUpLeft
⊜	\asapArrowCircleOpenLeft	↗	\asapArrowUpRight

asapsym requires either LuaLaTeX or XeLaTeX.

Table 390: typicons Arrows

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

typicons requires either LuaLaTeX or XeLaTeX.

Table 391: fontawesome5 Arrows

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

Table 392: marvosym Scissors

\CutLeft	\CuttingLine	\RightScissors	\CutRight	\LeftScissors	

Table 393: bbding Scissors

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

Table 394: pifont Scissors

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

Table 395: utfsym Scissors

✂	\usym{2700}	✂	\usym{2702}	✂	\usym{2704}
✁	\usym{2701}	✃	\usym{2703}		

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Table 396: dingbat Pencils

\largepencil \smallpencil

Table 397: arev Pencils

✎ \pencil

Table 398: typicons Pencils and Pens

\tiPen \tiPencil

typicons requires either LuaLaTeX or XeLaTeX.

Table 399: fontawesome5 Pencils, Pens, and Nibs

	\faHighlighter		\faPen		\faPenNib
	\faMarker		\faPencil*		\faPenSquare
	\faPen*		\faPenFancy		

Table 400: bbding Pencils and Nibs

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

Table 401: pifont Pencils and Nibs

✎	\ding{46}	✏	\ding{47}	✐	\ding{48}	✑	\ding{49}	✒	\ding{50}

Table 402: utfsym Pencils, Pens, and Nibs

✎	\usym{270E}	✑	\usym{2711}	🖉	\usym{1F58A}	🖋	\usym{1F58D}
✏	\usym{270F}	✒	\usym{2712}	🖊	\usym{1F58B}		
✐	\usym{2710}	🖌	\usym{1F589}	🖍	\usym{1F58C}		

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Table 403: dingbat Fists

☞	\leftpointright	☜	\rightpointleft	☞	\rightpointright
🖒	\leftthumbsdown	🖓	\rightthumbsdown		
🖒	\leftthumbsup	🖓	\rightthumbsup		

Table 404: bbding Fists

☚	\HandCuffLeft	☛	\HandCuffRightUp	✍	\HandPencilLeft
☚	\HandCuffLeftUp	☜	\HandLeft	☞	\HandRight
☚	\HandCuffRight	☜	\HandLeftUp	☞	\HandRightUp

Table 405: pifont Fists

☛	\ding{42}	☞	\ding{43}	✌	\ding{44}	✍	\ding{45}

Table 406: fourier Fists

☞	\lefthand	☜	\righthand

Table 407: arev Fists

☞	\pointright

Table 408: utfsym Fists

☚	\usym{261A}	↯	\usym{1F447}	✁	\usym{1F58F}	☚	\usym{1F59A}
☛	\usym{261B}	☜	\usym{1F448}	✐	\usym{1F590}	☛	\usym{1F59B}
☜	\usym{261C}	☞	\usym{1F449}	✑	\usym{1F591}	☚	\usym{1F59C}
☝	\usym{261D}	✊	\usym{1F44A}	✒	\usym{1F592}	☛	\usym{1F59D}
☞	\usym{261E}	✋	\usym{1F44B}	✓	\usym{1F593}	✍	\usym{1F59E}
✌	\usym{261F}	✌	\usym{1F44C}	✔	\usym{1F594}	✎	\usym{1F59F}
✍	\usym{270A}	✍	\usym{1F44D}	✕	\usym{1F595}	✏	\usym{1F5A0}
✎	\usym{270B}	✎	\usym{1F44E}	✖	\usym{1F596}	✐	\usym{1F5A1}
✏	\usym{270C}	✏	\usym{1F44F}	✗	\usym{1F597}	✑	\usym{1F5A2}
✐	\usym{270D}	✐	\usym{1F450}	✘	\usym{1F598}	✒	\usym{1F5A3}
✑	\usym{1F446}	✑	\usym{1F58E}	✙	\usym{1F599}		

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Table 409: typicons Fists

🖒	\tiThumbsDown	🖗	\tiThumbsOk	🖓	\tiThumbsUp

typicons requires either LuaLaTeX or XeLaTeX.

Table 410: fontawesome5 Fists

✊	\faFistRaised	👆	\faHandPointUp
🤲	\faHandHolding	👆	\faHandPointUp[regular]
🤲	\faHandHoldingHeart	✊	\faHandRock
🤲	\faHandHoldingMedical	✊	\faHandRock[regular]
🤲	\faHandHoldingUsd	🙌	\faHands
🤲	\faHandHoldingWater	✌	\faHandScissors
🤚	\faHandLizard	✌	\faHandScissors[regular]
🤚	\faHandLizard[regular]	🤝	\faHandshake
🖕	\faHandMiddleFinger	🤝	\faHandshake[regular]
✋	\faHandPaper	🤝	\faHandshakeAltSlash
✋	\faHandPaper[regular]	🤝	\faHandshakeSlash
✌	\faHandPeace	🤝	\faHandsHelping
✌	\faHandPeace[regular]	🤚	\faHandSparkles
👇	\faHandPointDown	🖖	\faHandSpock
👇	\faHandPointDown[regular]	🖖	\faHandSpock[regular]
👉	\faHandPointer	🙌	\faHandsWash
👉	\faHandPointer[regular]	👎	\faThumbsDown
👈	\faHandPointLeft	👎	\faThumbsDown[regular]
👈	\faHandPointLeft[regular]	👍	\faThumbsUp
👉	\faHandPointRight	👍	\faThumbsUp[regular]
👉	\faHandPointRight[regular]		

Table 411: bbding Crosses and Plusses

✝	\Cross	✞	\CrossOpenShadow	✙	\PlusOutline
✟	\CrossBoldOutline	✝	\CrossOutline	✛	\PlusThinCenterOpen
✣	\CrossClowerTips	✚	\Plus		
✠	\CrossMaltese	✜	\PlusCenterOpen		

Table 412: pifont Crosses and Plusses

✙	\ding{57}	✛	\ding{59}	✝	\ding{61}	✟	\ding{63}
✚	\ding{58}	✜	\ding{60}	✞	\ding{62}	✠	\ding{64}

Table 413: adfsymbols Crosses and Plusses

✖	\adfbullet{4}	✖	\adfbullet{6}	✙	\adfbullet{8}	✙	\adfbullet{10}
✚	\adfbullet{5}	✚	\adfbullet{7}	✚	\adfbullet{9}		

Table 414: utfsym Crosses and Plusses

✙	\usym{2719}	✝	\usym{271D}	✢	\usym{2722}	✞	\usym{1F546}
✚	\usym{271A}	✟	\usym{271E}	✣	\usym{2723}	✝	\usym{1F547}
✛	\usym{271B}	✠	\usym{271F}	✤	\usym{2724}	✟	\usym{1F548}
✜	\usym{271C}	✠	\usym{2720}	✥	\usym{2725}		

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

Table 415: arev Crosses

☥	\eastcross	☥	\westcross

Table 416: bbding Xs and Check Marks

✓	\Checkmark	✕	\XSolid	✗	\XSolidBrush
✔	\CheckmarkBold	✖	\XSolidBold		

Table 417: pifont Xs and Check Marks

✓	\ding{51}	✕	\ding{53}	✗	\ding{55}
✔	\ding{52}	✖	\ding{54}	✘	\ding{56}

Table 418: wasysym Xs and Check Marks

☑	\CheckedBox	□	\Square	☒	\XBox

Table 419: marvosym Xs and Check Marks

☑	\Checkedbox	☒	\CrossedBox*	□	\HollowBox

* marvosym defines \Crossedbox as a synonym for \CrossedBox.

Table 420: arev Xs and Check Marks

✓	\ballotcheck	✗	\ballotx

Table 421: utfsym Xs and Check Marks

☐	\usym{2610}	✓	\usym{2713}	✘	\usym{2718}	🗸	\usym{1F5F8}
☑	\usym{2611}	✔	\usym{2714}	🗙	\usym{1F5F4}	🗹	\usym{1F5F9}
☒	\usym{2612}	✕	\usym{2715}	🗵	\usym{1F5F5}		
✕	\usym{2613}	✖	\usym{2716}	🗶	\usym{1F5F6}		
✔	\usym{2705}	✗	\usym{2717}	🗷	\usym{1F5F7}		

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Table 422: typicons Xs and Check Marks

⊗	\tiDelete	☑	\tiInputCheckedOutline	✖	\tiTimes
⊗	\tiDeleteOutline	✔	\tiTick	⊠	\tiTimesOutline
☑	\tiInputChecked	✔	\tiTickOutline		

typicons requires either LuaLaTeX or XeLaTeX.

Table 423: fontawesome5 Xs and Check Marks

✔	\faCheck	☑	\faCheckSquare[regular]
✔	\faCheckCircle	✖	\faTimes
✔	\faCheckCircle[regular]	✖	\faTimesCircle
✔	\faCheckDouble	✖	\faTimesCircle[regular]
☑	\faCheckSquare		

Table 424: pifont Circled Numerals

①	\ding{172}	❶	\ding{182}	①	\ding{192}	❶	\ding{202}
②	\ding{173}	❷	\ding{183}	②	\ding{193}	❷	\ding{203}
③	\ding{174}	❸	\ding{184}	③	\ding{194}	❸	\ding{204}
④	\ding{175}	❹	\ding{185}	④	\ding{195}	❹	\ding{205}
⑤	\ding{176}	❺	\ding{186}	⑤	\ding{196}	❺	\ding{206}
⑥	\ding{177}	❻	\ding{187}	⑥	\ding{197}	❻	\ding{207}
⑦	\ding{178}	❼	\ding{188}	⑦	\ding{198}	❼	\ding{208}
⑧	\ding{179}	❽	\ding{189}	⑧	\ding{199}	❽	\ding{209}
⑨	\ding{180}	❾	\ding{190}	⑨	\ding{200}	❾	\ding{210}
⑩	\ding{181}	❿	\ding{191}	⑩	\ding{201}	❿	\ding{211}

pifont (part of the psnfss package) provides a `dingautolist` environment which resembles `enumerate` but uses circled numbers as bullets.[1] See the psnfss documentation for more information.

Table 425: utfsym Circled Numerals

❶	\usym{2776}	❾	\usym{277E}	⑦	\usym{2786}	❺	\usym{278E}
❷	\usym{2777}	❿	\usym{277F}	⑧	\usym{2787}	❻	\usym{278F}
❸	\usym{2778}	①	\usym{2780}	⑨	\usym{2788}	❼	\usym{2790}
❹	\usym{2779}	②	\usym{2781}	⑩	\usym{2789}	❽	\usym{2791}
❺	\usym{277A}	③	\usym{2782}	❶	\usym{278A}	❾	\usym{2792}
❻	\usym{277B}	④	\usym{2783}	❷	\usym{278B}	❿	\usym{2793}
❼	\usym{277C}	⑤	\usym{2784}	❸	\usym{278C}		
❽	\usym{277D}	⑥	\usym{2785}	❹	\usym{278D}		

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Table 426: wasysym Stars

✡	\davidsstar	⚹	\hexstar	✳	\varhexstar

Table 427: bbding 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	❀	\FourClowerOpen	❆	\SnowflakeChevronBold
✷	\EightStarConvex	✤	\FourClowerSolid	✻	\Sparkle
✶	\EightStarTaper	✦	\FourStar	✼	\SparkleBold
❀	\FiveFlowerOpen	✧	\FourStarOpen	✹	\TwelweStar

[1] In fact, `dingautolist` can use any set of consecutive Zapf Dingbats symbols.

Table 428: 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 429: 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 430: utfsym Stars, Flowers, and Similar Shapes

★	\usym{2605}	✬	\usym{272B}	✸	\usym{2737}	❋	\usym{2743}
☆	\usym{2606}	✭	\usym{272C}	✸	\usym{2738}	❄	\usym{2744}
✪	\usym{26E4}	✮	\usym{272D}	✹	\usym{2739}	❅	\usym{2745}
✫	\usym{26E5}	✯	\usym{272E}	✺	\usym{273A}	❆	\usym{2746}
✬	\usym{26E6}	✰	\usym{272F}	✻	\usym{273B}	❇	\usym{2747}
✭	\usym{26E7}	✩	\usym{2730}	✼	\usym{273C}	❈	\usym{2748}
✡	\usym{2721}	✱	\usym{2731}	✽	\usym{273D}	❉	\usym{2749}
✦	\usym{2726}	✲	\usym{2732}	✾	\usym{273E}	❊	\usym{274A}
✧	\usym{2727}	✳	\usym{2733}	✿	\usym{273F}	❋	\usym{274B}
✮	\usym{2728}	✴	\usym{2734}	❀	\usym{2740}	✡	\usym{1F52F}
✯	\usym{2729}	✵	\usym{2735}	❁	\usym{2741}		
✪	\usym{272A}	✶	\usym{2736}	❂	\usym{2742}		

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

Table 431: adforn Stars

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

Table 432: typicons Stars

★	\tiStar	★	\tiStarFullOutline	☆	\tiStarOutline
✹	\tiStarburst	⯪	\tiStarHalf		
✺	\tiStarburstOutline	⯪	\tiStarHalfOutline		

typicons requires either LuaLaTeX or XeLaTeX.

Table 433: fontawesome5 Stars

★	\faStar	⯪	\faStarHalf*	⯪	\faStarHalf[regular]
☆	\faStar[regular]	⯪	\faStarHalf	✱	\faStarOfLife

Table 434: fourier Fleurons and Flowers

❦	\aldine	✻	\decoone	❀	\floweroneright
❦	\aldineleft	✧	\decosix	⬬	\leafleft
❦	\aldineright	❧	\decothreeleft	⬬	\leafNE
❧	\aldinesmall	❧	\decothreeright	⬬	\leafright
❧	\decofourleft	❦	\decotwo	✦	\starredbullet
❧	\decofourright	❀	\floweroneleft		

Table 435: adforn Fleurons and Flowers

❦	\adfdownhalfleafleft	❦	\adfdownhalfleafright
❦	\adfdownleafleft	❦	\adfdownleafright
❦	\adfflatdownhalfleafleft	❦	\adfflatdownhalfleafright
❦	\adfflatdownoutlineleafleft	❦	\adfflatdownoutlineleafright
❧	\adfflatleafleft	❧	\adfflatleafright
❧	\adfflatleafoutlineleft	❧	\adfflatleafoutlineright
❧	\adfflatleafsolidleft	❧	\adfflatleafsolidright
❦	\adfflowerleft	❦	\adfflowerright
❧	\adfhalfleafleft	❧	\adfhalfleafright
❦	\adfhangingflatleafleft	❦	\adfhangingflatleafright
❦	\adfhangingleafleft	❦	\adfhangingleafright
❧	\adfleafleft	❧	\adfleafright
❧	\adfoutlineleafleft	❧	\adfoutlineleafright
❧	\adfsmallhangingleafleft	❧	\adfsmallhangingleafright
❧	\adfsmallleafleft	❧	\adfsmallleafright
❧	\adfsolidleafleft	❧	\adfsolidleafright

Table 436: wasysym Geometric Shapes

○	\Circle	◐	\LEFTcircle	⬯	\octagon	◑	\RIGHTcircle
●	\CIRCLE	◖	\LEFTCIRCLE	⬠	\pentagon	◗	\RIGHTCIRCLE
⬡	\hexagon	◐	\Leftcircle	◗	\Rightcircle	⬡	\varhexagon

Table 437: MnSymbol Geometric Shapes

★	\filledlargestar	◊	\largelozenge	◊	\medlozenge
⧫	\filledlozenge	✯	\largepentagram	✡	\medstarofdavid
⧫	\filledmedlozenge	□	\largesquare	◊	\smalllozenge
○	\largecircle	☆	\largestar		
◇	\largediamond	✡	\largestarofdavid		

MnSymbol defines \bigcirc as a synonym for \largecircle; \bigstar as a synonym for \filledlargestar; \lozenge as a synonym for \medlozenge; and, \blacklozenge as a synonym for \filledmedlozenge.

Table 438: fdsymbol Geometric Shapes

●	\largeblackcircle	▽	\largetriangledown	◊	\medlozenge
■	\largeblacksquare	△	\largetriangleup	⧫	\smallblacklozenge
★	\largeblackstar	☆	\largewhitestar	◊	\smalllozenge
○	\largecircle	⧫	\lozengeminus	✡	\starofdavid
□	\largesquare	⧫	\medblacklozenge		

fdsymbol defines synonyms for almost all of the preceding symbols:

○	\bigcirc	■	\lgblksquare	◊	\mdlgwhtlozenge
★	\bigstar	○	\lgwhtcircle	◊	\mdwhtlozenge
▽	\bigtriangledown	□	\lgwhtsquare	⧫	\smblklozenge
△	\bigtriangleup	◊	\lozenge	◊	\smwhtlozenge
⧫	\blacklozenge	⧫	\mdblklozenge		
●	\lgblkcircle	⧫	\mdlgblklozenge		

Table 439: boisik Geometric Shapes

★	\bigstar	⋄	\diamond	▽	\triangledown
⧫	\blacklozenge	◊	\lozenge	◁	\triangleleft
■	\blacksquare	◊	\lozengedot	▷	\triangleright
▲	\blacktriangle	□	\square	◿	\varlrttriangle
▼	\blacktriangledown	⋆	\star		

Table 440: stix Geometric Shapes

↺	\acwopencirclearrow	○	\enclosecircle	◆	\smblkdiamond
↖	\barovernorthwestarrow	◇	\enclosediamond	⧫	\smblklozenge
⌬	\benzenr	□	\enclosesquare	■	\smblksquare
▼	\bigblacktriangledown	△	\enclosetriangle	☆	\smwhitestar
▲	\bigblacktriangleup	⦶	\errbarblackcircle	∘	\smwhtcircle
★	\bigstar	⦷	\errbarblackdiamond	⋄	\smwhtdiamond
▽	\bigtriangledown	⦸	\errbarblacksquare	⧫	\smwhtlozenge
◁	\bigtriangleleft	⦵	\errbarcircle	▫	\smwhtsquare
△	\bigtriangleup	⦻	\errbardiamond	⧈	\sqlozenge
☆	\bigwhitestar	⧲	\errbarsquare	⬓	\squarebotblack
⬇	\blackcircledownarrow	◉	\fisheye	▩	\squarecrossfill
⚈	\blackcircledrightdot	▱	\fltns	▤	\squarehfill
⚉	\blackcircledtwodots	⬡	\hexagon	▦	\squarehvfill
◕	\blackcircleulquadwhite	⬢	\hexagonblack	◧	\squareleftblack
⧫	\blackdiamonddownarrow	⌂	\house	◩	\squarellblack
◈	\blackinwhitediamond	▭	\hrectangle	◱	\squarellquad
▣	\blackinwhitesquare	▬	\hrectangleblack	◪	\squarelrblack
◖	\blacklefthalfcircle	◙	\inversewhitecircle	◲	\squarelrquad
◀	\blackpointerleft	◡	\invwhitelowerhalfcircle	▨	\squareneswfill
▶	\blackpointerright	◠	\invwhiteupperhalfcircle	▧	\squarenwsefill
◗	\blackrighthalfcircle	●	\lgblkcircle	◨	\squarerightblack
▲	\blacktriangle	■	\lgblksquare	▀	\squaretopblack
▼	\blacktriangledown	○	\lgwhtcircle	◪	\squareulblack
◀	\blacktriangleleft	□	\lgwhtsquare	◰	\squareulquad
▶	\blacktriangleright	◣	\llblacktriangle	◩	\squareurblack
⬬	\blkhorzoval	◺	\lltriangle	◳	\squareurquad
⬮	\blkvertoval	◢	\lrblacktriangle	▥	\squarevfill
◡	\botsemicircle	◿	\lrtriangle	▢	\squoval
⧉	\boxonbox	●	\mdblkcircle	◠	\topsemicircle
◎	\bullseye	◆	\mdblkdiamond	⏢	\trapezium
∘	\circ	⧫	\mdblklozenge	◬	\trianglecdot
◒	\circlebottomhalfblack	■	\mdblksquare	▽	\triangledown
◉	\circledbullet	●	\mdlgblkcircle	◭	\triangleleftblack
⚲	\circledownarrow	◆	\mdlgblkdiamond	△	\triangleodot
⊙	\circledrightdot	⧫	\mdlgblklozenge	◮	\triangleserightblack
✪	\circledstar	■	\mdlgblksquare	Ⓢ	\triangles
⊙	\circledtwodots	◇	\mdlgwhtdiamond	⧋	\triangleubar
◎	\circledwhitebullet	◇	\mdlgwhtlozenge	◤	\ulblacktriangle
◐	\circlelefthalfblack	□	\mdlgwhtsquare	◸	\ultriangle
◵	\circlellquad	•	\mdsmblkcircle	⍐	\uparrowoncircle
◶	\circlelrquad	■	\mdsmblksquare	◥	\urblacktriangle
◑	\circlerighthalfblack	∘	\mdsmwhtcircle	◹	\urtriangle
◓	\circletophalfblack	▫	\mdsmwhtsquare	⬡	\varhexagon

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◴	\circleulquad	○	\mdwhtcircle	⬢	\varhexagonblack
◷	\circleurquad	◇	\mdwhtdiamond	⌬	\varhexagonlrbonds
◔	\circleurquadblack	◊	\mdwhtlozenge	◿	\varlrtriangle
◍	\circlevertfill	□	\mdwhtsquare	✶	\varstar
⧂	\cirE	★	\medblackstar	◁	\vartriangleleft
⧁	\cirscir	☆	\medwhitestar	▷	\vartriangleright
↻	\cwopencirclearrow	▱	\parallelogram	▯	\vrectangle
⬙	\diamondbotblack	▰	\parallelogramblack	▮	\vrectangleblack
⟐	\diamondcdot	⬠	\pentagon	▪	\vysmblksquare
◆	\diamondleftblack	⬟	\pentagonblack	▫	\vysmwhtsquare
◆	\diamondrightblack	⬠	\rightpentagon	◬	\whiteinwhitetriangle
⬘	\diamondtopblack	⬟	\rightpentagonblack	◁	\whitepointerleft
◌	\dottedcircle	◂	\smallblacktriangleleft	▷	\whitepointerright
⬚	\dottedsquare	▸	\smallblacktriangleright	⬭	\whthorzoval
◸	\downtriangleleftblack	◁	\smalltriangleleft	0	\whtvertoval
◹	\downtrianglerightblack	▷	\smalltriangleright		

stix defines \diamond as a synonym for \smwhtdiamond, \blacksquare as a synonym for \mdlgblksquare, \square and \Box as synonyms for \mdlgwhtsquare, \triangle and \varbigtriangleup as synonyms for \bigtriangleup, \rhd as a synonym for \vartriangleright, \varbigtriangledown as a synonym for \bigtriangledown, \lhd as a synonym for \vartriangleleft, \Diamond and \lozenge as synonyms for \mdlgwhtlozenge, \bigcirc as a synonym for \mdlgwhtcircle, \circ as a synonym for \smwhtcircle. and \blacklozenge as a synonym for \mdlgblklozenge.

Table 441: ifsym Geometric Shapes

◯	\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

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\BigVBar	\FilledSmallTriangleRight	\SmallVBar
\Circle	\FilledSmallTriangleUp	\SpinDown
\Cross	\FilledSquare	\SpinUp
\DiamondShadowA	\FilledSquareShadowA	\Square
\DiamondShadowB	\FilledSquareShadowC	\SquareShadowA
\DiamondShadowC	\FilledTriangleDown	\SquareShadowB
\Diamondshape	\FilledTriangleLeft	\SquareShadowC
\FilledBigCircle	\FilledTriangleRight	\TriangleDown
\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 "◉". Likewise, `\Square` and `\Cross` combine to give "☒". See Section 12.3 for more information about constructing new symbols out of existing symbols.

Table 442: bbding Geometric Shapes

\CircleShadow	\Rectangle	\SquareShadowTopLeft
\CircleSolid	\RectangleBold	\SquareShadowTopRight
\DiamondSolid	\RectangleThin	\SquareSolid
\Ellipse	\Square	\TriangleDown
\EllipseShadow	\SquareCastShadowBottomRight	\TriangleUp
\EllipseSolid	\SquareCastShadowTopLeft	
\HalfCircleLeft	\SquareCastShadowTopRight	
\HalfCircleRight	\SquareShadowBottomRight	

Table 443: 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 444: universa Geometric Shapes

\baucircle \bausquare \bautriangle

Table 445: 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 446: utfsym Geometric Shapes

●	\usym{1F534}	◆	\usym{1F537}	◭	\usym{1F53A}	▼	\usym{1F53D}
●	\usym{1F535}	◆	\usym{1F538}	▼	\usym{1F53B}		
◆	\usym{1F536}	◆	\usym{1F539}	◭	\usym{1F53C}		

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

Table 447: fontawesome5 Geometric Shapes

●	\faCircle	◉	\faDotCircle	□	\faSquare[regular]
○	\faCircle[regular]	⦿	\faDotCircle[regular]	■	\faSquareFull
○	\faCircleNotch	■	\faSquare		

Table 448: oplotsymbl Geometric Shapes

○	\circlet	◆	\rhombusfillha	△	\trianglepalineh
⊠	\circletcross	◆	\rhombusfillhb	⚠	\trianglepalinev
⊙	\circletdot	◆	\rhombusfillhl	⚠	\trianglepalinevh
●	\circletfill	◆	\rhombusfillhr	▽	\trianglepb
◓	\circletfillha	◇	\rhombuslineh	⊠	\trianglepbcross
◒	\circletfillhb	◇	\rhombuslinev	▽	\trianglepbdot
◐	\circletfillhl	◈	\rhombuslinevh	▼	\trianglepbfill
◑	\circletfillhr	□	\squad	▽	\trianglepbfillha
⊖	\circletlineh	⊠	\squadcross	▼	\trianglepbfillhb
⊘	\circletlinev	⊡	\squaddot	▼	\trianglepbfillhl
⊕	\circletlinevh	■	\squadfill	▼	\trianglepbfillhr

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⬡	\hexago	⬒	\squadfillha	▽	\trianglepblineh
⊗	\hexagocross	⬓	\squadfillhb	▽	\trianglepblinev
⊙	\hexagodot	◧	\squadfillhl	▽	\trianglepblinevh
⬢	\hexagofill	◨	\squadfillhr	◁	\trianglepl
⬣	\hexagofillha	⊟	\squadlineh	⊠	\triangleplcross
⬙	\hexagofillhb	◫	\squadlinev	◁	\triangleplcdot
◐	\hexagofillhl	⊞	\squadlinevh	◀	\triangleplfill
◑	\hexagofillhr	☆	\starlet	◁	\triangleplfillha
⊖	\hexagolineh	✵	\starletcross	◀	\triangleplfillhb
⬡	\hexagolinev	✯	\starletdot	◀	\triangleplfillhl
⊕	\hexagolinevh	★	\starletfill	◀	\triangleplfillhr
⬠	\pentago	✯	\starletfillha	◁	\triangleplllineh
⊠	\pentagocross	✯	\starletfillhb	◁	\triangleplllinev
⊙	\pentagodot	✯	\starletfillhl	◁	\triangleplllinevh
⬟	\pentagofill	✯	\starletfillhr	▷	\trianglepr
⬟	\pentagofillha	✯	\starletlineh	⊠	\triangleprcross
⬟	\pentagofillhb	✯	\starletlinev	▷	\triangleprdot
◐	\pentagofillhl	✯	\starletlinevh	▶	\triangleprfill
◑	\pentagofillhr	△	\trianglepa	▷	\triangleprfillha
⬠	\pentagolineh	⊠	\trianglepacross	▶	\triangleprfillhb
⬠	\pentagolinev	⊙	\trianglepadot	▶	\triangleprfillhl
⊕	\pentagolinevh	▲	\trianglepafill	▶	\triangleprfillhr
◇	\rhombus	▲	\trianglepafillha	▷	\triangleprlineh
⊠	\rhombuscross	▲	\trianglepafillhb	▷	\triangleprlinev
⊙	\rhombusdot	◭	\trianglepafillhl	▷	\triangleprlinevh
◆	\rhombusfill	◭	\trianglepafillhr		

"fillha", "fillhb", "fillhl", and "fillhr", imply, respectively, "half-filled above", "half-filled below", "half-filled left", and "half-filled right". In the \triangle... symbols, "pa", "pb", "pr", and "pl" refer respectively to "peak above", "peak below", "peak left", and "peak right".

All oplotsymbl symbols are implemented with Ti*k*Z graphics, not with a font.

Table 449: 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 450: Miscellaneous oplotsymbl Symbols

_	\lineh	|	\linev	+	\linevh	X	\scross	✳	\scrossvh

All oplotsymbl symbols are implemented with Ti*k*Z graphics, not with a font.

Table 451: Miscellaneous dingbat Dingbats

⚓	\anchor	👁	\eye	🖃	\Sborder
↩	\carriagereturn	⚙	\filledsquarewithdots	⚙	\squarewithdots
✓	\checkmark	🛰	\satellitedish	🖃	\Zborder

Table 452: Miscellaneous bbding Dingbats

✉	\Envelope	✌	\Peace	✆	\PhoneHandset	⚙	\SunshineOpenCircled
❖	\OrnamentDiamondSolid	☎	\Phone	✈	\Plane	☮	\Tape

Table 453: Miscellaneous pifont Dingbats

☎	\ding{37}	✈	\ding{40}	❤	\ding{164}	❧	\ding{167}	♠	\ding{171}
✆	\ding{38}	✉	\ding{41}	❥	\ding{165}	♣	\ding{168}	♦	\ding{169}
☮	\ding{39}	❖	\ding{118}	❦	\ding{166}	♥	\ding{170}		

Table 454: Miscellaneous adforn Dingbats

•	\adfbullet	◇	\adfdiamond	☙	\adfgee	§	\adfS	▫	\adfsquare

Table 455: Miscellaneous utfsym Dingbats

✆	\usym{2706}	❢	\usym{2755}	❲	\usym{2762}	❯	\usym{276F}
✇	\usym{2707}	❖	\usym{2756}	❳	\usym{2763}	❰	\usym{2770}
✈	\usym{2708}	❗	\usym{2757}	❤	\usym{2764}	❱	\usym{2771}
✉	\usym{2709}	❘	\usym{2758}	❥	\usym{2765}	❲	\usym{2772}
✌	\usym{274C}	❙	\usym{2759}	❦	\usym{2766}	❳	\usym{2773}
✍	\usym{274D}	❚	\usym{275A}	❧	\usym{2767}	❴	\usym{2774}
✎	\usym{274E}	❶	\usym{275B}	❨	\usym{2768}	❵	\usym{2775}
✏	\usym{274F}	❷	\usym{275C}	❩	\usym{2769}	➕	\usym{2795}
✐	\usym{2750}	❸	\usym{275D}	❪	\usym{276A}	➖	\usym{2796}
✑	\usym{2751}	❹	\usym{275E}	❫	\usym{276B}	➗	\usym{2797}
✒	\usym{2752}	❺	\usym{275F}	❬	\usym{276C}	➰	\usym{27B0}
✓	\usym{2753}	❻	\usym{2760}	❭	\usym{276D}	➿	\usym{27BF}
✔	\usym{2754}	❼	\usym{2761}	❮	\usym{276E}		

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

Chapter 6

Ancient languages

This chapter presents letters and ideograms from various ancient scripts. Some of these symbols may also be useful in other typesetting contexts because of their pictorial nature.

TABLE 456: phaistos Symbols from the Phaistos Disk

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

Table 457: protosem Proto-Semitic Characters

𐤀	\Aaleph	𐤄	\AAhe	𐤊	\Akaph	𐤏	\AAayin	𐤓	\AAresh
𐤁	\AAaleph	𐤅	\Avav	𐤋	\AAkaph	𐤐	\Ape	𐤔	\Ashin
𐤂	\Abeth	𐤆	\Azayin	𐤌	\Alamed	𐤑	\AApe	𐤕	\Atav
𐤃	\AAbeth	𐤇	\Aheth	𐤍	\AAlamed	𐤒	\Asade	𐤖	\Ahelmet
𐤄	\Agimel	𐤈	\AAheth	𐤎	\Amem	𐤓	\AAsade	𐤗	\AAhelmet
𐤅	\Adaleth	𐤉	\Ateth	𐤏	\Anun	𐤔	\Aqoph		
𐤆	\AAdaleth	𐤊	\Ayod	𐤐	\Asamekh	𐤕	\AAqoph		
𐤇	\Ahe	𐤋	\AAyod	𐤑	\Aayin	𐤗	\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 "𐤑𐤀𐤊𐤋𐤏"). See the protosem documentation for more information.

Table 458: hieroglf 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		\Hr		\Hx
	\HF		\Hm		\Hs		\HY
	\HG		\HM		\HS		\Hy
	\Hg		\Hman		\Hscribe		\Hz
	\Hh		\Hms		\Hslash		\HZ
	\HH		\HN		\Hsv		
	\Hone		\Hhundred		\HXthousand		\Hmillion
	\Hten		\Hthousand		\HCthousand		

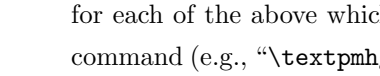
The hieroglf package defines alternate control sequences and single-letter shortcuts for each of the above which can be used within the argument to the `\textpmhg` command (e.g., "`\textpmhg{Pakin}`" produces "  "). See the hieroglf documentation for more information.

Table 459: linearA Linear A Script

	\LinearAI		\LinearAXCIX		\LinearACXCVII		\LinearACCXCV
	\LinearAII		\LinearAC		\LinearACXCVIII		\LinearACCXCVI
	\LinearAIII		\LinearACI		\LinearACXCIX		\LinearACCXCVII
	\LinearAIV		\LinearACII		\LinearACC		\LinearACCXCVIII
	\LinearAV		\LinearACIII		\LinearACCI		\LinearACCXCIX

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	\LinearAVI		\LinearACIV		\LinearACCII		\LinearACCC
	\LinearAVII		\LinearACV		\LinearACCIII		\LinearACCCI
	\LinearAVIII		\LinearACVI		\LinearACCIV		\LinearACCCII
	\LinearAIX		\LinearACVII		\LinearACCV		\LinearACCCIII
	\LinearAX		\LinearACVIII		\LinearACCVI		\LinearACCCIV
	\LinearAXI		\LinearACIX		\LinearACCVII		\LinearACCCV
	\LinearAXII		\LinearACX		\LinearACCVIII		\LinearACCCVI
	\LinearAXIII		\LinearACXI		\LinearACCIX		\LinearACCCVII
	\LinearAXIV		\LinearACXII		\LinearACCX		\LinearACCCVIII
	\LinearAXV		\LinearACXIII		\LinearACCXI		\LinearACCCIX
	\LinearAXVI		\LinearACXIV		\LinearACCXII		\LinearACCCX
	\LinearAXVII		\LinearACXV		\LinearACCXIII		\LinearACCCXI
	\LinearAXVIII		\LinearACXVI		\LinearACCXIV		\LinearACCCXII
	\LinearAXIX		\LinearACXVII		\LinearACCXV		\LinearACCCXIII
	\LinearAXX		\LinearACXVIII		\LinearACCXVI		\LinearACCCXIV
	\LinearAXXI		\LinearACXIX		\LinearACCXVII		\LinearACCCXV
	\LinearAXXII		\LinearACXX		\LinearACCXVIII		\LinearACCCXVI
	\LinearAXXIII		\LinearACXXI		\LinearACCXIX		\LinearACCCXVII
	\LinearAXXIV		\LinearACXXII		\LinearACCXX		\LinearACCCXVIII
	\LinearAXXV		\LinearACXXIII		\LinearACCXXI		\LinearACCCXIX
	\LinearAXXVI		\LinearACXXIV		\LinearACCXXII		\LinearACCCXX
	\LinearAXXVII		\LinearACXXV		\LinearACCXXIII		\LinearACCCXXI
	\LinearAXXVIII		\LinearACXXVI		\LinearACCXXIV		\LinearACCCXXII
	\LinearAXXIX		\LinearACXXVII		\LinearACCXXV		\LinearACCCXXIII
	\LinearAXXX		\LinearACXXVIII		\LinearACCXXVI		\LinearACCCXXIV
	\LinearAXXXI		\LinearACXXIX		\LinearACCXXVII		\LinearACCCXXV
	\LinearAXXXII		\LinearACXXX		\LinearACCXXVIII		\LinearACCCXXVI
	\LinearAXXXIII		\LinearACXXXI		\LinearACCXXIX		\LinearACCCXXVII
	\LinearAXXXIV		\LinearACXXXII		\LinearACCXXX		\LinearACCCXXVIII
	\LinearAXXXV		\LinearACXXXIII		\LinearACCXXXI		\LinearACCCXXIX
	\LinearAXXXVI		\LinearACXXXIV		\LinearACCXXXII		\LinearACCCXXX
	\LinearAXXXVII		\LinearACXXXV		\LinearACCXXXIII		\LinearACCCXXXI
	\LinearAXXXVIII		\LinearACXXXVI		\LinearACCXXXIV		\LinearACCCXXXII
	\LinearAXXXIX		\LinearACXXXVII		\LinearACCXXXV		\LinearACCCXXXIII
	\LinearAXL		\LinearACXXXVIII		\LinearACCXXXVI		\LinearACCCXXXIV
	\LinearAXLI		\LinearACXXXIX		\LinearACCXXXVII		\LinearACCCXXXV
	\LinearAXLII		\LinearACXL		\LinearACCXXXVIII		\LinearACCCXXXVI
	\LinearAXLIII		\LinearACXLI		\LinearACCXXXIX		\LinearACCCXXXVII
	\LinearAXLIV		\LinearACXLII		\LinearACCXL		\LinearACCCXXXVIII
	\LinearAXLV		\LinearACXLIII		\LinearACCXLI		\LinearACCCXXXIX
	\LinearAXLVI		\LinearACXLIV		\LinearACCXLII		\LinearACCCXL
	\LinearAXLVII		\LinearACXLV		\LinearACCXLIII		\LinearACCCXLI
	\LinearAXLVIII		\LinearACXLVI		\LinearACCXLIV		\LinearACCCXLII
	\LinearAXLIX		\LinearACXLVII		\LinearACCXLV		\LinearACCCXLIII
	\LinearAL		\LinearACXLVIII		\LinearACCXLVI		\LinearACCCXLIV

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𐇁	\LinearALI	𐇻	\LinearACXLIX	𐈓	\LinearACCXLVII	𐇼	\LinearACCCXLV
𐇂	\LinearALII	𐇼	\LinearACL	𐈔	\LinearACCXLVIII	𐇽	\LinearACCCXLVI
𐇃	\LinearALIII	𐇽	\LinearACLI	𐈕	\LinearACCXLIX	𐇾	\LinearACCCXLVII
𐇄	\LinearALIV	𐇾	\LinearACLII	𐈖	\LinearACCL	𐇿	\LinearACCCXLVIII
𐇅	\LinearALV	𐇿	\LinearACLIII	𐈗	\LinearACCLI	𐈀	\LinearACCCXLIX
𐇆	\LinearALVI	𐈀	\LinearACLIV	𐈘	\LinearACCLII	𐈁	\LinearACCCL
𐇇	\LinearALVII	𐈁	\LinearACLV	𐈙	\LinearACCLIII	𐈂	\LinearACCCLI
𐇈	\LinearALVIII	𐈂	\LinearACLVI	𐈚	\LinearACCLIV	𐈃	\LinearACCCLII
𐇉	\LinearALIX	𐈃	\LinearACLVII	𐈛	\LinearACCLV	𐈄	\LinearACCCLIII
𐇊	\LinearALX	𐈄	\LinearACLVIII	𐈜	\LinearACCLVI	𐈅	\LinearACCCLIV
𐇋	\LinearALXI	𐈅	\LinearACLIX	𐈝	\LinearACCLVII	𐈆	\LinearACCCLV
𐇌	\LinearALXII	𐈆	\LinearACLX	𐈞	\LinearACCLVIII	𐈇	\LinearACCCLVI
𐇍	\LinearALXIII	𐈇	\LinearACLXI	𐈟	\LinearACCLIX	𐈈	\LinearACCCLVII
𐇎	\LinearALXIV	𐈈	\LinearACLXII	𐈠	\LinearACCLX	𐈉	\LinearACCCLVIII
𐇏	\LinearALXV	𐈉	\LinearACLXIII	𐈡	\LinearACCLXI	𐈊	\LinearACCCLIX
𐇐	\LinearALXVI	𐈊	\LinearACLXIV	𐈢	\LinearACCLXII	𐈋	\LinearACCCLX
𐇑	\LinearALXVII	𐈋	\LinearACLXV	𐈣	\LinearACCLXIII	𐈌	\LinearACCCLXI
𐇒	\LinearALXVIII	𐈌	\LinearACLXVI	𐈤	\LinearACCLXIV	𐈍	\LinearACCCLXII
𐇓	\LinearALXIX	𐈍	\LinearACLXVII	𐈥	\LinearACCLXV	𐈎	\LinearACCCLXIII
𐇔	\LinearALXX	𐈎	\LinearACLXVIII	𐈦	\LinearACCLXVI	𐈏	\LinearACCCLXIV
𐇕	\LinearALXXI	𐈏	\LinearACLXIX	𐈧	\LinearACCLXVII	𐈐	\LinearACCCLXV
𐇖	\LinearALXXII	𐈐	\LinearACLXX	𐈨	\LinearACCLXVIII	𐈑	\LinearACCCLXVI
𐇗	\LinearALXXIII	𐈑	\LinearACLXXI	𐈩	\LinearACCLXIX	𐈒	\LinearACCCLXVII
𐇘	\LinearALXXIV	𐈒	\LinearACLXXII	𐈪	\LinearACCLXX	𐈓	\LinearACCCLXVIII
𐇙	\LinearALXXV	𐈓	\LinearACLXXIII	𐈫	\LinearACCLXXI	𐈔	\LinearACCCLXIX
𐇚	\LinearALXXVI	𐈔	\LinearACLXXIV	𐈬	\LinearACCLXXII	𐈕	\LinearACCCLXX
𐇛	\LinearALXXVII	𐈕	\LinearACLXXV	𐈭	\LinearACCLXXIII	𐈖	\LinearACCCLXXI
𐇜	\LinearALXXVIII	𐈖	\LinearACLXXVI	𐈮	\LinearACCLXXIV	𐈗	\LinearACCCLXXII
𐇝	\LinearALXXIX	𐈗	\LinearACLXXVII	𐈯	\LinearACCLXXV	𐈘	\LinearACCCLXXIII
𐇞	\LinearALXXX	𐈘	\LinearACLXXVIII	𐈰	\LinearACCLXXVI	𐈙	\LinearACCCLXXIV
𐇟	\LinearALXXXI	𐈙	\LinearACLXXIX	𐈱	\LinearACCLXXVII	𐈚	\LinearACCCLXXV
𐇠	\LinearALXXXII	𐈚	\LinearACLXXX	𐈲	\LinearACCLXXVIII	𐈛	\LinearACCCLXXVI
𐇡	\LinearALXXXIII	𐈛	\LinearACLXXXI	𐈳	\LinearACCLXXIX	𐈜	\LinearACCCLXXVII
𐇢	\LinearALXXXIV	𐈜	\LinearACLXXXII	𐈴	\LinearACCLXXX	𐈝	\LinearACCCLXXVIII
𐇣	\LinearALXXXV	𐈝	\LinearACLXXXIII	𐈵	\LinearACCLXXXI	𐈞	\LinearACCCLXXIX
𐇤	\LinearALXXXVI	𐈞	\LinearACLXXXIV	𐈶	\LinearACCLXXXII	𐈟	\LinearACCCLXXX
𐇥	\LinearALXXXVII	𐈟	\LinearACLXXXV	𐈷	\LinearACCLXXXIII	𐈠	\LinearACCCLXXXI
𐇦	\LinearALXXXVIII	𐈠	\LinearACLXXXVI	𐈸	\LinearACCLXXXIV	𐈡	\LinearACCCLXXXII
𐇧	\LinearALXXXIX	𐈡	\LinearACLXXXVII	𐈹	\LinearACCLXXXV	𐈢	\LinearACCCLXXXIII
𐇨	\LinearALXXXX	𐈢	\LinearACLXXXVIII	𐈺	\LinearACCLXXXVI	𐈣	\LinearACCCLXXXIV
𐇩	\LinearAXCI	𐈣	\LinearACLXXXIX	𐈻	\LinearACCLXXXVII	𐈤	\LinearACCCLXXXV
𐇪	\LinearAXCII	𐈤	\LinearACLXXXX	𐈼	\LinearACCLXXXVIII	𐈥	\LinearACCCLXXXVI
𐇫	\LinearAXCIII	𐈥	\LinearACXCI	𐈽	\LinearACCLXXXIX	𐈦	\LinearACCCLXXXVII
𐇬	\LinearAXCIV	𐈦	\LinearACXCII	𐈾	\LinearACCLXXXX	𐈧	\LinearACCCLXXXVIII
𐇭	\LinearAXCV	𐈧	\LinearACXCIII	𐈿	\LinearACCXCI	𐈨	\LinearACCCLXXXIX
𐇮	\LinearAXCVI	𐈨	\LinearACXCIV	𐉀	\LinearACCXCII		

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𐄳	`\LinearAXCVII`	𐄴	`\LinearACXCV`	𐄵	`\LinearACCXCIII`
𐄶	`\LinearAXCVIII`	𐄷	`\LinearACXCVI`	𐄸	`\LinearACCXCIV`

Table 460: linearb Linear B Basic and Optional Letters

𐀀	`\Ba`	𐀁	`\Bja`	𐀂	`\Bmu`	𐀃	`\Bpte`	𐀄	`\Broii`	𐀅	`\Bto`
𐀆	`\Baii`	𐀇	`\Bje`	𐀈	`\Bna`	𐀉	`\Bpu`	𐀊	`\Bru`	𐀋	`\Btu`
𐀌	`\Baiii`	𐀍	`\Bjo`	𐀎	`\Bne`	𐀏	`\Bpuii`	𐀐	`\Bsa`	𐀑	`\Btwo`
𐀒	`\Bau`	𐀓	`\Bju`	𐀔	`\Bni`	𐀕	`\Bqa`	𐀖	`\Bse`	𐀗	`\Bu`
𐀘	`\Bda`	𐀙	`\Bka`	𐀚	`\Bno`	𐀛	`\Bqe`	𐀜	`\Bsi`	𐀝	`\Bwa`
𐀞	`\Bde`	𐀟	`\Bke`	𐀠	`\Bnu`	𐀡	`\Bqi`	𐀢	`\Bso`	𐀣	`\Bwe`
𐀤	`\Bdi`	𐀥	`\Bki`	𐀦	`\Bnwa`	𐀧	`\Bqo`	𐀨	`\Bsu`	𐀩	`\Bwi`
𐀪	`\Bdo`	𐀫	`\Bko`	𐀬	`\Bo`	𐀭	`\Bra`	𐀮	`\Bswa`	𐀯	`\Bwo`
𐀰	`\Bdu`	𐀱	`\Bku`	𐀲	`\Bpa`	𐀳	`\Braii`	𐀴	`\Bswi`	𐀵	`\Bza`
𐀶	`\Bdwe`	𐀷	`\Bma`	𐀸	`\Bpaiii`	𐀹	`\Braiii`	𐀺	`\Bta`	𐀻	`\Bze`
𐀼	`\Bdwo`	𐀽	`\Bme`	𐀾	`\Bpe`	𐀿	`\Bre`	𐁀	`\Btaii`	𐁁	`\Bzo`
𐁂	`\Be`	𐁃	`\Bmi`	𐁄	`\Bpi`	𐁅	`\Bri`	𐁆	`\Bte`		
𐁇	`\Bi`	𐁈	`\Bmo`	𐁉	`\Bpo`	𐁊	`\Bro`	𐁋	`\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 "𐁲𐁥𐁹", for example. See the linearb documentation for more information.

Table 461: linearb Linear B Numerals

𐄇	`\BNi`	𐄈	`\BNvii`	𐄉	`\BNxl`	𐄊	`\BNc`	𐄋	`\BNdcc`
𐄌	`\BNii`	𐄍	`\BNviii`	𐄎	`\BNl`	𐄏	`\BNcc`	𐄐	`\BNdccc`
𐄑	`\BNiii`	𐄒	`\BNix`	𐄓	`\BNlx`	𐄔	`\BNccc`	𐄕	`\BNcm`
𐄖	`\BNiv`	𐄗	`\BNx`	𐄘	`\BNlxx`	𐄙	`\BNcd`	𐄚	`\BNm`
𐄛	`\BNv`	𐄜	`\BNxx`	𐄝	`\BNlxxx`	𐄞	`\BNd`		
𐄟	`\BNvi`	𐄠	`\BNxxx`	𐄡	`\BNxc`	𐄢	`\BNdc`		

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

Table 462: linearb Linear B Weights and Measures

	\BPtalent		\BPvolb		\BPvolcf		\BPwtb		\BPwtd
	\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 463: 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 464: 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 465: cypriot Cypriot Letters

𐠀	\Ca	𐠊	\Cku	𐠒	\Cmu	𐠚	\Cpo	𐠢	\Cso	𐠬	\Cwi
𐠁	\Ce	𐠋	\Cla	𐠓	\Cna	𐠛	\Cpu	𐠣	\Csu	𐠭	\Cwo
𐠂	\Cga	𐠌	\Cle	𐠔	\Cne	𐠜	\Cra	𐠤	\Cta	𐠮	\Cxa
𐠃	\Ci	𐠍	\Cli	𐠕	\Cni	𐠝	\Cre	𐠥	\Cte	𐠯	\Cxe
𐠄	\Cja	𐠎	\Clo	𐠖	\Cno	𐠞	\Cri	𐠦	\Cti	𐠰	\Cya
𐠅	\Cjo	𐠏	\Clu	𐠗	\Cnu	𐠟	\Cro	𐠧	\Cto	𐠱	\Cyo
𐠆	\Cka	𐠐	\Cma	𐠘	\Co	𐠠	\Cru	𐠨	\Ctu	𐠲	\Cza
𐠇	\Cke	𐠑	\Cme	𐠙	\Cpa	𐠡	\Csa	𐠩	\Cu	𐠳	\Czo
𐠈	\Cki	𐠒	\Cmi	𐠚	\Cpe	𐠢	\Cse	𐠪	\Cwa		
𐠉	\Cko	𐠓	\Cmo	𐠛	\Cpi	𐠣	\Csi	𐠫	\Cwe		

These symbols must appear either within the argument to `\textcypr` or following the `\cyprfamily` font-selection command within a scope. Single-character shortcuts are also supported: Both "`\textcypr{\Cpa\Cki\Cna}`" and "`\textcypr{pcn}`" produce "𐠙𐠈𐠓", for example. See the cypriot documentation for more information.

Table 466: sarabian South Arabian Letters

𐩠	\SAa	𐩧	\SAz	𐩫	\SAm	𐩰	\SAsd	𐩴	\SAdb
𐩡	\SAb	𐩨	\SAhd	𐩬	\SAn	𐩱	\SAq	𐩵	\SAtb
𐩢	\SAg	𐩩	\SAtd	𐩭	\SAs	𐩲	\SAr	𐩶	\SAga
𐩣	\SAd	𐩪	\SAy	𐩮	\SAf	𐩳	\SAsv	𐩷	\SAzd
𐩤	\SAh	𐩫	\SAk	𐩯	\SAlq	𐩸	\SAt	𐩹	\SAsa
𐩥	\SAw	𐩬	\SAl	𐩰	\SAo	𐩺	\SAhu	𐩻	\SAdd

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

Table 467: teubner Archaic Greek Letters and Greek Numerals

ϙ	\Coppa†	Ϝ	\Digamma*	ϡ	\sampi*	ϛ	\varstigma
ϙ	\coppa†	ϟ	\koppa*	Ϛ	\Stigma		
ϝ	\digamma*,‡	ϡ	\Sampi	ϛ	\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 468: boisik Archaic Greek Letters and Greek Numerals

Ϝ	\Digamma	ϙ	\qoppa	ϛ	\stigma	Ϡ	\varsampi
ϝ	\digamma	Ϙ	\Qoppa	Ϛ	\Stigma		
ϝ	\heta	Ϡ	\Sampi	ϝ	\vardigamma		
Ϝ	\Heta	ϡ	\sampi	Ϡ	\Varsampi		

Table 469: epiolmec Epi-Olmec Script

	\EOafter		\EOMiddle		\EOStarWarrior
	\EOandThen		\EOmonster		\EOstep
	\EOAppear		\EOMountain		\EOSu
	\EOBeardMask		\EOmuu		\EOsu
	\EOBedeck		\EOna		\EOsun
	\EOBlood		\EOne		\EOsuu
	\EObrace		\EOni		\EOSuu
	\EObuilding		\EOnow		\EOta
	\EOBundle		\EOnu		\EOte
	\EOChop		\EOnuu		\EOthrone

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\EOChronI

\EOCloth

\EODealWith

\EODeer

\EOeat

\EOflint

\EOflower

\EOFold

\EOGod

\EOGoUp

\EOgovernor

\EOGuise

\EOHallow

\EOja

\EOjaguar

\EOje

\EOji

\EOJI

\EOjo

\EOju

\EOkak

\EOke

\EOki

\EOkij

\EOKing

\EOknottedCloth

\EOofficerI

\EOofficerII

\EOofficerIII

\EOofficerIV

\EOpa

\EOpak

\EOPatron

\EOPatronII

\EOpe

\EOpenis

\EOpi

\EOPierce

\EOPlant

\EOPlay

\EOpo

\EOpriest

\EOPrince

\EOpu

\EOpuu

\EOpuuk

\EORain

\EOSa

\EOsa

\EOsacrifice

\EOSaw

\EOScorpius

\EOti

\EOtime

\EOTime

\EOTitle

\EOTitleII

\EOTitleIV

\EOto

\EOtu

\EOtuki

\EOtukpa

\EOturtle

\EOtuu

\EOtza

\EOtze

\EOtzetze

\EOtzi

\EOtzu

\EOtzuu

\EOundef

\EOvarBeardMask

\EOvarja

\EOvarji

\EOvarki

\EOvarkuu

\EOvarni

\EOvarpa

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\EOknottedClothStraps
\EOko
\EOku
\EOkuu
\EOLetBlood
\EOloinCloth
\EOlongLipII
\EOLord
\EOLose
\EOma
\EOmacaw
\EOmacawI
\EOme
\EOmexNew
\EOmi
\EOset
\EOsi
\EOSi
\EOsing
\EOSini
\EOskin
\EOSky
\EOskyAnimal
\EOskyPillar
\EOsnake
\EOSo
\EOSpan
\EOSprinkle
\EOstar
\EOstarWarrior
\EOvarSi
\EOvarsi
\EOvartza
 \EOvarwuu
\EOvarYear
\EOwa
\EOwe
\EOwi
\EOwo
\EOwuu
 \EOya
\EOyaj
\EOye
\EOYear
\EOyuu

Table 470: epiolmec Epi-Olmec Numerals

\EOzero
\EOi
\EOii
\EOiii
\EOiv
\EOv
\EOvi
\EOvii
\EOviii
\EOix
\EOx
\EOxi
\EOxii
\EOxiii
\EOxiv
 \EOxv
\EOxvi
\EOxvii
\EOxviii
\EOxix
 \EOxx

Table 471: allrunes Runes

ᚦ	\a	�higher	E	ᛜ	\ING	ᛗ	m	ᛉ	R	ᛊ	\sthree
ᚪ	\A	ᚠ	F	ᛝ	\ing	ᚾ	n	ᛣ	\RR	ᛏ	T
ᚨ	a	ᚡ	f	ᛞ	\Ing	ᛟ	\NG	ᛋ	\s	ᛏ	t
ᛎ	A	ᚷ	g	ᛟ	\j	ᛜ	\ng	ᛌ	s	ᛋ	\textsection
ᛒ	b	ᚺ	\h	ᛃ	j	ᛟ	o	ᛐ	S	ᚦ	\th
ᛒ	B	ᚾ	H	ᛇ	J	ᛈ	\p	ᛐ	\seight	ᚢ	U
ᛞ	\d	ᚺ	h	ᚲ	\k	ᛕ	p	ᛐ	\sfive	ᚢ	u
ᛞ	D	ᛃ	\i	ᚴ	\K	ᛗ	P	ᛐ	\sfour	ᚹ	w
ᛞ	d	ᛁ	i	ᚲ	k	ᚣ	\R	ᛐ	\sseven		
ᛖ	e	ᛇ	I	ᛚ	l	ᚱ	r	ᛐ	\ssix		

The symbols in this table should appear within the argument to \textarc (for common Germanic runes), \textara (for Anglo-Frisian runes), \textarn (for normal runes), \textart (for short-twig runes), \textarl (for staveless runes), \textarm (for medieval runes), or within a scope that sets, respectively, \arcfamily, \arafamily, \arnfamily, \artfamily, \arlfamily, or \armfamily. Each family presents slightly different glyphs and/or slightly different subsets of the available runes. (The table presents the common Germanic runes.) See the allrunes documentation for more information.

Table 472: allrunes Rune Separators

ᛁ	\bar	⁖	\doubleeye	⁘	\plus	⁞	\tripledot
⁎	\cross	‡	\doubleplus	⁝	\quaddot	⁛	\tripleeye
·	\dot	⁑	\doublestar	⁙	\quadeye	‡	\tripleplus
ᛁ	\doublebar	·	\eye	⁕	\star		
⁑	\doublecross	⁝	\pentdot	ᛁ	\triplebar		
⁖	\doubledot	⁜	\penteye	⁂	\triplecross		

See the usage comment under Table 471 on page 211.

Chapter 7

Musical symbols

The following symbols are used to typeset musical notation. The *lily*lyp♭s package provides a large subset of the symbols in this chapter. Note, however, that *lily*lyp♭s depends upon the fontspec package, OpenType (`.otf`) fonts, and some PDF graphics and therefore works only with LuaLaTeX or XeLaTeX.

A simple way to typeset time signatures, due to Daniel Hirst, is to attach a superscript and a subscript to an empty math object. For example, `${}^3_4$` renders as "$^3_4$". Because superscripts and subscripts are left-justified, some extra padding may need to be added if the beats per measure and beat unit contain different numbers of digits. A 5 mu space ("`\;`") vertically centers the "8" relative to the "12" in `${}^{12}_{\;8}$` ("$^{12}_{\;8}$"). For boldface time signatures (e.g., "$\mathbf{^4_4}$"), consider the boldface-math options presented in Section 12.5. See also Table 486.

Table 473: LaTeX 2ε Musical Symbols

♭	`\flat`	♮	`\natural`	♯	`\sharp`

Table 474: textcomp Musical Symbols

♪	`\textmusicalnote`

Table 475: wasysym Musical Symbols

♪	`\eighthnote`	𝅗𝅥	`\halfnote`	♫	`\twonotes`	𝅝	`\fullnote`	♩	`\quarternote`

Table 476: MnSymbol Musical Symbols

♭	`\flat`	♮	`\natural`	♯	`\sharp`

Table 477: fdsymbol Musical Symbols

♭	\flat	♮	\natural	♯	\sharp

Table 478: boisik Musical Symbols

♭	\flat	♮	\natural	♯	\sharp

Table 479: stix Musical Symbols

♪	\eighthnote	♮	\natural	♯	\sharp
♭	\flat	♩	\quarternote	♫	\twonotes

Table 480: arev Musical Symbols

♩	\quarternote	♪	\eighthnote	♬	\sixteenthnote

Table 481: utfsym Musical Symbols

♩	\usym{2669}	𝅘𝅥𝅯	\usym{266C}	♯	\usym{266F}	𝅘𝅥𝅱	\usym{1F3B5}
♪	\usym{266A}	♭	\usym{266D}	𝅘𝅥𝅰	\usym{1F39C}	𝅘𝅥𝅲	\usym{1F3B6}
♫	\usym{266B}	♮	\usym{266E}	𝅘𝅥𝅮	\usym{1F39D}	𝅘𝅥𝅳	\usym{1F3BC}

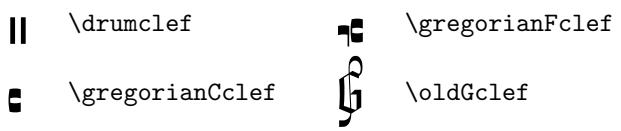
All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to \usym, the utfsym package defines \usymH, which renders a symbol at a given height, and \usymW, which renders a symbol at a given width. See the utfsym documentation for more information.

Table 482: MusiXTEX Musical Symbols

	\allabreve		\lsf		\shake
	\altoclef		\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		\sPed
	\ds		\qp		\trebleclef
	\duevolte		\qqs		\trill
	\fermatadown		\qs		\turn
	\fermataup		\reverseallabreve		\upbow
	\flageolett		\reverseC		\usf
	\hpause		\sDep		\usfz
	\hs		\Segno		\wq
	\longa		\segno		\wqq

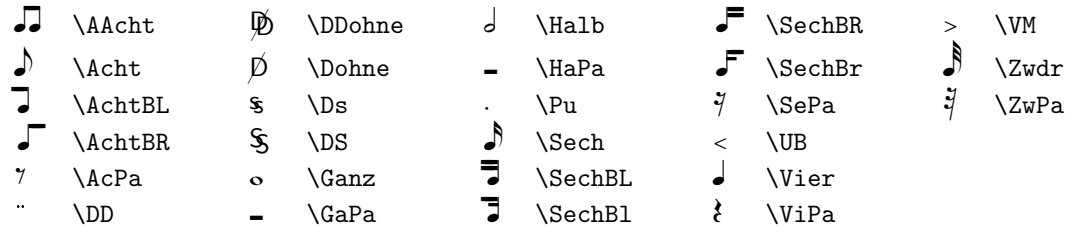
All of these symbols are intended to be used in the context of typesetting musical scores. See the MusiXTEX documentation for more information.

Table 483: MusiXTEX Alternative Clefs



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 staffs and all of the necessary neumes. See the MusiXTEX documentation for more information.

Table 484: harmony Musical Symbols



The MusiXTEX package must be installed to use harmony.

Table 485: musicography Musical Symbols

𝄫	\musDoubleFlat	♮	\musNatural	𝅘𝅥𝅱	\musSixtyFourth
𝄪	\musDoubleSharp	𝅗𝅥	\musQuarter	𝅘𝅥𝅱.	\musSixtyFourthDotted
𝅘𝅥𝅮	\musEighth	𝅗𝅥.	\musQuarterDotted	𝅘𝅥𝅰	\musThirtySecond
𝅘𝅥𝅮.	\musEighthDotted	𝄋	\musSegno	𝅘𝅥𝅰.	\musThirtySecondDotted
♭	\musFlat	♯	\musSharp	𝅝	\musWhole
𝅗𝅥	\musHalf	𝅘𝅥𝅯	\musSixteenth	𝅝.	\musWholeDotted
𝅗𝅥.	\musHalfDotted	𝅘𝅥𝅯.	\musSixteenthDotted		

musicography defines \fl, \sh, and \na as shorthands for \musFlat, \musSharp, and \musNatural, respectively. It also defines \musCorchea as an alias for \musEighth, \musCorcheaDotted as an alias for \musEighthDotted, \musFusa as an alias for \musEighth, \musFusaDotted as an alias for \musEighthDotted, \musMinim as an alias for \musHalf, \musMinimDotted as an alias for \musHalfDotted, \musSemibreve as an alias for \musWhole, \musSemibreveDotted as an alias for \musWholeDotted, \musSemiminim as an alias for \musQuarter, and \musSeminiminimDotted as an alias for \musQuarterDotted.

The MusiXTEX package must be installed to use musicography.

Table 486: musicography Time Signatures

𝐂	\meterC	$\mathbf{C}_2^3$	\meterCThreeTwo	𝐂𝒵	\meterCZ
𝐂3	\meterCThree	𝐂¢	\meterCutC	◯	\meterO

Other time signatures can be specified with \musMeter, as in

\musMeter{2}{4} → $\frac{2}{4}$

The MusiXTEX package must be installed to use musicography.

Table 487: harmony Musical Accents

Âa	\Ferli{A}\Ferli{a}*	A̸a	\Ohne{A}\Ohne{a}*
Âa	\Fermi{A}\Fermi{a}	A a	\Umd{A}\Umd{a}*
Ⓐ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 "$\mathsf{X}_{a}^{\flat}{}_{d}$". All arguments except the first can be omitted: "\HH.X....." produces "X". \Takt takes two arguments and composes them into a musical time signature. For example, "\Takt{12}{8}" produces "$\frac{12}{8}$". As two special cases, "\Takt{c}{0}" produces "𝐂" and "\Takt{c}{1}" produces "𝐂".

The MusiXTEX package must be installed to use harmony.

Table 488: *lily*𝄞ly*pbs* 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

lily𝄞ly*pbs* 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 489: *lily*𝄞ly*pbs* Beamed Notes

♫	\twoBeamedQuavers	♩.♫	\threeBeamedQuaversII
♫♪	\threeBeamedQuavers	♫♩.	\threeBeamedQuaversIII
♫♩.𝅘𝅥𝅯	\threeBeamedQuaversI		

Table 490: *lily*𝄞ly*pbs* 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 *lily*𝄞ly*pbs* documentation for more information.

Table 491: *lily*𝄞ly*pbs* Time Signatures

𝐂	`\lilyTimeC`	𝐂	`\lilyTimeCHalf`

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

Table 492: *lily*𝄞ly*pbs* Accidentals

𝄪	`\doublesharp`	𝄯	`\sharpArrowdown`
♭	`\flat`	𝄰	`\sharpArrowup`
𝄫	`\flatflat`	𝄲	`\sharpSlashshslashslashStem`
♮	`\natural`	𝄳	`\sharpSlashshslashshslashStemstem`
♯	`\sharp`	𝄱	`\sharpSlashshslashStem`
𝄰	`\sharpArrowboth`	𝄳	`\sharpSlashshslashStemstemstem`

Table 493: *lily*𝄞ly*pbs* Rests

𝄽	`\crotchetRest`	𝄾.	`\quaverRestDotted`
𝄽.	`\crotchetRestDotted`	𝄿	`\semiquaverRest`
𝄼	`\halfNoteRest`	𝄿.	`\semiquaverRestDotted`
𝄼.	`\halfNoteRestDotted`	𝄻	`\wholeNoteRest`
𝄾	`\quaverRest`	𝄻.	`\wholeNoteRestDotted`

Multiply dotted rests can be produced with the `\lilyPrintMoreDots` command. See the *lily*𝄞ly*pbs* documentation for more information.

Table 494: *lily*𝄞ly*pbs* Dynamics Letters

f	`\lilyDynamics{f}`	*r*	`\lilyDynamics{r}`
p	`\lilyDynamics{p}`	*s*	`\lilyDynamics{s}`
m	`\lilyDynamics{m}`	*z*	`\lilyDynamics{z}`
rf	`\lilyRF`	*rfz*	`\lilyRFZ`

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

Table 495: *lily*lyp♭s Dynamics Symbols

<	\crescHairpin	>	\decrescHairpin

Table 496: *lily*lyp♭s Articulations

>	\lilyAccent	^	\marcato	'	\staccatissimo
<>	\lilyEspressivo	v	\marcatoDown	_	\tenuto
.	\lilyStaccato	+	\portato		
0	\lilyThumb	-	\portatoDown		

Table 497: *lily*lyp♭s Scripts

𝄐	\fermata

Table 498: *lily*lyp♭s Accordion Notation

𝄪	\accordionBayanBass	𝄋	\accordionOldEE	𝄗	\accordionStdBass
𝄗	\accordionDiscant	𝄆	\accordionPull		
𝄫	\accordionFreeBass	𝄇	\accordionPush		

Table 499: *lily*lyp♭s Named Time Signatures

𝄵	\lilyGlyph{timesig.C22}	𝄶	\lilyGlyph{timesig.mensural98}
𝄴	\lilyGlyph{timesig.C44}	𝄸	\lilyGlyph{timesig.neomensural22}
𝄷	\lilyGlyph{timesig.mensural22}	𝄹	\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}

*lily*lyp♭s defines shorter names for a few of these symbols. See Table 491.

Table 500: *lily𝄞lyp♭s* Named Scripts

`\lilyGlyph{scripts.arpeggio}`	`\lilyGlyph{scripts.prallmordent}`
`\lilyGlyph{scripts.arpeggio.arrow.1}`	`\lilyGlyph{scripts.prallprall}`
`\lilyGlyph{scripts.arpeggio.arrow.M1}`	`\lilyGlyph{scripts.prallup}`
`\lilyGlyph{scripts.augmentum}`	`\lilyGlyph{scripts.rcomma}`
`\lilyGlyph{scripts.barline.kievan}`	`\lilyGlyph{scripts.reverseturn}`
`\lilyGlyph{scripts.caesura.curved}`	`\lilyGlyph{scripts.rvarcomma}`
`\lilyGlyph{scripts.caesura.straight}`	`\lilyGlyph{scripts.segno}`
`\lilyGlyph{scripts.circulus}`	`\lilyGlyph{scripts.sforzato}`
`\lilyGlyph{scripts.coda}`	`\lilyGlyph{scripts.snappizzicato}`
`\lilyGlyph{scripts.daccentus}`	`\lilyGlyph{scripts.staccato}`
`\lilyGlyph{scripts.dfermata}`	`\lilyGlyph{scripts.stopped}`
`\lilyGlyph{scripts.dlongfermata}`	`\lilyGlyph{scripts.tenuto}`
`\lilyGlyph{scripts.dmarcato}`	`\lilyGlyph{scripts.thumb}`
`\lilyGlyph{scripts.downbow}`	`\lilyGlyph{scripts.tickmark}`
`\lilyGlyph{scripts.downmordent}`	`\lilyGlyph{scripts.trilelement}`
`\lilyGlyph{scripts.downprall}`	`\lilyGlyph{scripts.trill}`
`\lilyGlyph{scripts.dpedalheel}`	`\lilyGlyph{scripts.trill_element}`
`\lilyGlyph{scripts.dpedaltoe}`	`\lilyGlyph{scripts.turn}`
`\lilyGlyph{scripts.dportato}`	`\lilyGlyph{scripts.uaccentus}`
`\lilyGlyph{scripts.dsemicirculus}`	`\lilyGlyph{scripts.ufermata}`*
`\lilyGlyph{scripts.dshortfermata}`	`\lilyGlyph{scripts.ulongfermata}`
`\lilyGlyph{scripts.dsignumcongruentiae}`	`\lilyGlyph{scripts.umarcato}`
`\lilyGlyph{scripts.dstaccatissimo}`	`\lilyGlyph{scripts.upbow}`
`\lilyGlyph{scripts.dverylongfermata}`	`\lilyGlyph{scripts.upedalheel}`
`\lilyGlyph{scripts.espr}`	`\lilyGlyph{scripts.upedaltoe}`
`\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}`	

* *lily𝄞lyp♭s* defines `\fermata` as a shorter name for "𝄐" than `\lilyGlyph{scripts.ufermata}`. See Table 497.

Table 501: *lily*𝄞ly*pbs* 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}`*		

* *lily*𝄞ly*pbs* defines shorter names for these symbols. See Table 493.

Table 502: *lily*𝄞ly*pbs* Named Pedals

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

Table 503: *lily*𝄞lyp♭s 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 504: *lily*𝄞lyp♭s 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 505: *lily*𝄞ly*pbs* Named Clefs

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

* *lily*𝄞ly*pbs* defines shorter names for these symbols. See Table 490.

Table 506: *lily*lyp♭s Named Noteheads

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

(continued on next page)

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\lilyGlyph{noteheads.d3kievan}
\lilyGlyph{noteheads.dM2}
\lilyGlyph{noteheads.dM2blackmensural}
\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}
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\lilyGlyph{noteheads.s0sol}

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- \lilyGlyph{noteheads.s2laFunk}
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\lilyGlyph{noteheads.svaticana.punctum}
\lilyGlyph{noteheads.svaticana.punctum.cavum}

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\lilyGlyph{noteheads.svaticana.vupes}
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\lilyGlyph{noteheads.u0faThin}
\lilyGlyph{noteheads.u0miFunk}
\lilyGlyph{noteheads.u0reFunk}
\lilyGlyph{noteheads.u0tiFunk}
\lilyGlyph{noteheads.u1do}
\lilyGlyph{noteheads.u1doFunk}
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\lilyGlyph{noteheads.u1faFunk}
\lilyGlyph{noteheads.u1faThin}
\lilyGlyph{noteheads.u1faWalker}
\lilyGlyph{noteheads.u1miFunk}
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\lilyGlyph{noteheads.u1reWalker}
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\lilyGlyph{noteheads.u1tiThin}
\lilyGlyph{noteheads.u1tiWalker}
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\lilyGlyph{noteheads.u2doFunk}
\lilyGlyph{noteheads.u2doThin}
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\lilyGlyph{noteheads.u2reWalker}
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	`\lilyGlyph{noteheads.u2tiThin}`
	`\lilyGlyph{noteheads.u2tiWalker}`
	`\lilyGlyph{noteheads.u2triangle}`
	`\lilyGlyph{noteheads.u3kievan}`
	`\lilyGlyph{noteheads.uM2}`
	`\lilyGlyph{noteheads.uM2blackmensural}`
	`\lilyGlyph{noteheads.uM2mensural}`
	`\lilyGlyph{noteheads.uM2neomensural}`
	`\lilyGlyph{noteheads.uM2semimensural}`
	`\lilyGlyph{noteheads.uM3blackmensural}`
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	`\lilyGlyph{noteheads.uM3neomensural}`
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	`\lilyGlyph{noteheads.urM2semimensural}`
	`\lilyGlyph{noteheads.urM3mensural}`
	`\lilyGlyph{noteheads.urM3neomensural}`
	`\lilyGlyph{noteheads.urM3semimensural}`

Table 507: *lily*𝄞ly***pbs*** 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}`

lily𝄞ly***pbs*** defines shorter names for all of these symbols except `\lilyGlyph{accordion.dot}`. See Table 498.

Table 508: *lily*𝄞ly***pbs*** 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.medicaeaM1}
𝄪	\lilyGlyph{accidentals.mensural1}
𝄖	\lilyGlyph{accidentals.mensuralM1}
𝄋	\lilyGlyph{accidentals.mirroredflat}
𝄌	\lilyGlyph{accidentals.mirroredflat.backslash}
𝄍	\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.stemstemstem}*
𝄎	\lilyGlyph{accidentals.sharp.slashslashslash.stem}*
𝄏	\lilyGlyph{accidentals.sharp.slashslashslash.stemstem}*
𝄖	\lilyGlyph{accidentals.vaticana0}
𝄗	\lilyGlyph{accidentals.vaticanaM1}

* *lily*𝄞ly***pbs*** defines shorter names for these symbols. See Table 492.

Table 509: *lily*𝄞ly𝒑♭𝒔 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}	v	\lilyGlyph{arrowheads.open.1M1}

Table 510: *lily*𝄞ly𝒑♭𝒔 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{comma}	.	\lilyGlyph{period}		
-	\lilyGlyph{hyphen}	+	\lilyGlyph{plus}		

See Table 494 for an alternative way to typeset dynamics letters. *lily*𝄞ly𝒑♭𝒔 additionally provides a `\lilyText` command that can be useful for typesetting groups of the preceding symbols. See the *lily*𝄞ly𝒑♭𝒔 documentation for more information.

Table 511: Miscellaneous *lily*𝄞ly𝒑♭𝒔 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}		

Chapter 8

Gaming symbols

This chapter presents symbols related to games and gaming: playing-card suits, dice, and symbols used to represent pieces and moves in various games. Additional gaming symbols appear in Chapter 11, but those symbols are delivered by packages that provide minimal LaTeX support.

Table 512: LaTeX 2$_\varepsilon$ Playing-Card Suits

♣	`\clubsuit`	♢	`\diamondsuit`	♡	`\heartsuit`	♠	`\spadesuit`

Table 513: txfonts/pxfonts Playing-Card Suits

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

Table 514: MnSymbol Playing-Card Suits

♣	`\clubsuit`	♢	`\diamondsuit`	♡	`\heartsuit`	♠	`\spadesuit`

Table 515: fdsymbol Playing-Card Suits

♣	`\clubsuit`	♡	`\heartsuit`	♦	`\vardiamondsuit`
♢	`\diamondsuit`	♠	`\spadesuit`	♥	`\varheartsuit`

Table 516: boisik Playing-Card Suits

♣	`\clubsuit`	♢	`\diamondsuit`	♡	`\heartsuit`	♠	`\spadesuit`

Table 517: stix Playing-Card Suits

♣	\clubsuit	♡	\heartsuit	♧	\varclubsuit	♥	\varheartsuit
♢	\diamondsuit	♠	\spadesuit	♦	\vardiamondsuit	♤	\varspadesuit

Table 518: arev Playing-Card Suits

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

Table 519: twemojis Playing-Card Suits

♣	\twemoji{club suit}	♥	\twemoji{heart suit}
♦	\twemoji{diamond suit}	♠	\twemoji{spade suit}

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

Table 520: utfsym Playing-Card Suits

♠	\usym{2660}	♢	\usym{2662}	♤	\usym{2664}	♦	\usym{2666}
♡	\usym{2661}	♣	\usym{2663}	♥	\usym{2665}	♧	\usym{2667}

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

Table 521: utfsym Playing Cards

\usym{1F0A0}	\usym{1F0B7}	\usym{1F0CD}	\usym{1F0E3}				
\usym{1F0A1}	\usym{1F0B8}	\usym{1F0CE}	\usym{1F0E4}				
\usym{1F0A2}	\usym{1F0B9}	\usym{1F0CF}	\usym{1F0E5}				
\usym{1F0A3}	\usym{1F0BA}	\usym{1F0D1}	\usym{1F0E6}				
\usym{1F0A4}	\usym{1F0BB}	\usym{1F0D2}	\usym{1F0E7}				
\usym{1F0A5}	\usym{1F0BC}	\usym{1F0D3}	\usym{1F0E8}				
\usym{1F0A6}	\usym{1F0BD}	\usym{1F0D4}	\usym{1F0E9}				
\usym{1F0A7}	\usym{1F0BE}	\usym{1F0D5}	\usym{1F0EA}				
\usym{1F0A8}	\usym{1F0BF}	\usym{1F0D6}	\usym{1F0EB}				
\usym{1F0A9}	\usym{1F0C1}	\usym{1F0D7}	\usym{1F0EC}				
\usym{1F0AA}	\usym{1F0C2}	\usym{1F0D8}	\usym{1F0ED}				
\usym{1F0AB}	\usym{1F0C3}	\usym{1F0D9}	\usym{1F0EE}				
\usym{1F0AC}	\usym{1F0C4}	\usym{1F0DA}	\usym{1F0EF}				
\usym{1F0AD}	\usym{1F0C5}	\usym{1F0DB}	\usym{1F0F0}				
\usym{1F0AE}	\usym{1F0C6}	\usym{1F0DC}	\usym{1F0F1}				
\usym{1F0B1}	\usym{1F0C7}	\usym{1F0DD}	\usym{1F0F2}				
\usym{1F0B2}	\usym{1F0C8}	\usym{1F0DE}	\usym{1F0F3}				
\usym{1F0B3}	\usym{1F0C9}	\usym{1F0DF}	\usym{1F0F4}				
\usym{1F0B4}	\usym{1F0CA}	\usym{1F0E0}	\usym{1F0F5}				
\usym{1F0B5}	\usym{1F0CB}	\usym{1F0E1}					
\usym{1F0B6}	\usym{1F0CC}	\usym{1F0E2}					

All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, "`\usymH{1F0BE}{36pt}`" produces

See the utfsym documentation for more information.

Table 522: epsdice Dice

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

Table 523: 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 524: stix Dice

⚀	\dicei	⚂	\diceiii	⚄	\dicev
⚁	\diceii	⚃	\diceiv	⚅	\dicevi

Table 525: ifsym Dice

⚀	\Cube{1}	⚂	\Cube{3}	⚄	\Cube{5}
⚁	\Cube{2}	⚃	\Cube{4}	⚅	\Cube{6}

Table 526: utfsym Dice

🎲	\usym{2680}	🎲	\usym{2682}	🎲	\usym{2684}
🎲	\usym{2681}	🎲	\usym{2683}	🎲	\usym{2685}

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

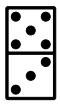
Table 527: fontawesome5 Dice

🎲	\faDice	⚅	\faDiceFive	⚅	\faDiceSix
🎲	\faDiceD20	⚅	\faDiceFour	⚅	\faDiceThree
🎲	\faDiceD6	⚅	\faDiceOne	⚅	\faDiceTwo

Table 528: utfsym Domino Tiles

\usym{1F030}	\usym{1F031}	\usym{1F032}	\usym{1F033}	\usym{1F034}	\usym{1F035}	\usym{1F036}	\usym{1F037}
\usym{1F038}	\usym{1F039}	\usym{1F03A}	\usym{1F03B}	\usym{1F03C}	\usym{1F03D}	\usym{1F03E}	\usym{1F03F}
\usym{1F040}	\usym{1F041}	\usym{1F042}	\usym{1F043}	\usym{1F044}	\usym{1F045}	\usym{1F046}	\usym{1F047}
\usym{1F048}	\usym{1F049}	\usym{1F04A}	\usym{1F04B}	\usym{1F04C}	\usym{1F04D}	\usym{1F04E}	\usym{1F04F}
\usym{1F050}	\usym{1F051}	\usym{1F052}	\usym{1F053}	\usym{1F054}	\usym{1F055}	\usym{1F056}	\usym{1F057}
\usym{1F058}	\usym{1F059}	\usym{1F05A}	\usym{1F05B}	\usym{1F05C}	\usym{1F05D}	\usym{1F05E}	\usym{1F05F}
\usym{1F060}	\usym{1F061}	\usym{1F062}	\usym{1F063}	\usym{1F064}	\usym{1F065}	\usym{1F066}	\usym{1F067}
\usym{1F068}	\usym{1F069}	\usym{1F06A}	\usym{1F06B}	\usym{1F06C}	\usym{1F06D}	\usym{1F06E}	\usym{1F06F}
\usym{1F070}	\usym{1F071}	\usym{1F072}	\usym{1F073}	\usym{1F074}	\usym{1F075}	\usym{1F076}	\usym{1F077}
\usym{1F078}	\usym{1F079}	\usym{1F07A}	\usym{1F07B}	\usym{1F07C}	\usym{1F07D}	\usym{1F07E}	\usym{1F07F}
\usym{1F080}	\usym{1F081}	\usym{1F082}	\usym{1F083}	\usym{1F084}	\usym{1F085}	\usym{1F086}	\usym{1F087}
\usym{1F088}	\usym{1F089}	\usym{1F08A}	\usym{1F08B}	\usym{1F08C}	\usym{1F08D}	\usym{1F08E}	\usym{1F08F}
\usym{1F090}	\usym{1F091}	\usym{1F092}	\usym{1F093}				

All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, "`\usymH{1F089}{36pt}`" produces



See the utfsym documentation for more information.

Table 529: utfsym Mahjong Tiles

🀀	\usym{1F000}	🀋	\usym{1F00B}	🀖	\usym{1F016}	🀡	\usym{1F021}
🀁	\usym{1F001}	🀌	\usym{1F00C}	🀗	\usym{1F017}	🀢	\usym{1F022}
🀂	\usym{1F002}	🀍	\usym{1F00D}	🀘	\usym{1F018}	🀣	\usym{1F023}
🀃	\usym{1F003}	🀎	\usym{1F00E}	🀙	\usym{1F019}	🀤	\usym{1F024}
🀄	\usym{1F004}	🀏	\usym{1F00F}	🀚	\usym{1F01A}	🀥	\usym{1F025}
🀅	\usym{1F005}	🀐	\usym{1F010}	🀛	\usym{1F01B}	🀦	\usym{1F026}
🀆	\usym{1F006}	🀑	\usym{1F011}	🀜	\usym{1F01C}	🀧	\usym{1F027}
🀇	\usym{1F007}	🀒	\usym{1F012}	🀝	\usym{1F01D}	🀨	\usym{1F028}
🀈	\usym{1F008}	🀓	\usym{1F013}	🀞	\usym{1F01E}	🀩	\usym{1F029}
🀉	\usym{1F009}	🀔	\usym{1F014}	🀟	\usym{1F01F}	🀪	\usym{1F02A}
🀊	\usym{1F00A}	🀕	\usym{1F015}	🀠	\usym{1F020}	🀫	\usym{1F02B}

All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to \usym, the utfsym package defines \usymH, which renders a symbol at a given height, and \usymW, which renders a symbol at a given width. For example, "\usymH{1F00B}{36pt}" produces

See the utfsym documentation for more information.

Table 530: utfsym Chess Pieces

♔	\usym{2654}	♗	\usym{2657}	♚	\usym{265A}	♝	\usym{265D}
♕	\usym{2655}	♘	\usym{2658}	♛	\usym{265B}	♞	\usym{265E}
♖	\usym{2656}	♙	\usym{2659}	♜	\usym{265C}	♟	\usym{265F}

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

Table 531: skak Chess Informator Symbols

∓	\bbetter	♊	\doublepawns	○‥○	\seppawns
−+	\bdecisive	⊥	\ending	O-O	\shortcastling
⌓	\betteris	=	\equal	⊕	\timelimit
⧉	\bishoppair	⇔	\file	∞	\unclear
∓	\bupperhand	»	\kside	○○	\unitedpawns
×	\capturesymbol	O-O-O	\longcastling	R	\various
O	\castlingchar	✕	\markera	±	\wbetter
-	\castlinghyphen	O	\markerb	+−	\wdecisive
⊞	\centre	#	\mate	⨯	\weakpt
+	\checksymbol	>	\morepawns	∟	\with
RR	\chesscomment	○	\moreroom	→	\withattack
‖	\chessetc	N	\novelty	△	\withidea
—	\chesssee	□	\onlymove	↑	\withinit
∞	\compensation	⧉	\opposbishops	⌟	\without
⇆	\counterplay	♁	\passedpawn	±	\wupperhand
↻	\devadvantage	«	\qside	⊙	\zugzwang
⇗	\diagonal	▞	\samebishops		

Table 532: 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 533: fontawesome5 Chess Pieces and Chessboards

\faChess	\faChessKing	\faChessQueen
\faChessBishop	\faChessKnight	\faChessRook
\faChessBoard	\faChessPawn	

Table 534: 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 ❶, ❷, ❸, . . . , 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 535: go Go Symbols

\botborder	\lftbotcorner	\rttopcorner
\empty	\lfttopcorner	\square
\hoshi	\rtborder	\topborder
\lftborder	\rtbotcorner	\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 ❶, ❷, ❸, . . . , 253 and ①, ②, ③, . . . , 253, respectively. `\black` and `\white` additionally accept `\square` and `\triangle` as arguments, producing ■ and and △ for `\black` and □ and and △ for `\white`.

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

Table 536: fontawesome5 Sports

\faBaseballBall	\faFootballBall	\faSkiing
\faBasketballBall	\faFutbol	\faSkiingNordic
\faBiking	\faFutbol[regular]	\faSnowboarding
\faBowlingBall	\faGolfBall	\faSwimmer
\faDribbble	\faHockeyPuck	\faTableTennis
\faDribbbleSquare	\faQuidditch	\faVolleyballBall
\faDumbbell	\faSkating	

Table 537: utfsym Games and Sports

	\usym{1F3AE}		\usym{1F3BF}		\usym{1F3C6}		\usym{1F3CF}
	\usym{1F3AF}		\usym{1F3C0}		\usym{1F3C7}		\usym{1F3D0}
	\usym{1F3B0}		\usym{1F3C1}		\usym{1F3C8}		\usym{1F3D1}
	\usym{1F3B1}		\usym{1F3C2}		\usym{1F3C9}		\usym{1F3D2}
	\usym{1F3B2}		\usym{1F3C3}		\usym{1F3CA}		\usym{1F3D3}
	\usym{1F3B3}		\usym{1F3C4}		\usym{1F3CB}		\usym{1F3F8}
	\usym{1F3BE}		\usym{1F3C5}		\usym{1F3CC}		\usym{1F3F9}

All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to \usym, the utfsym package defines \usymH, which renders a symbol at a given height, and \usymW, which renders a symbol at a given width. For example, "\usymH{1F3B0}{36pt}" produces

See the utfsym documentation for more information.

Chapter 9

Geographical Symbols

The symbols in this chapter relate in some manner to geography. In particular, the following tables present both maps and national and regional flags.

TABLE 538: countriesofeurope Country Maps

	\Albania		\Latvia
	\Andorra		\Liechtenstein
	\Austria		\Lithuania
	\Belarus		\Luxembourg
	\Belgium		\Macedonia
	\Bosnia		\Malta
	\Bulgaria		\Moldova
	\Croatia		\Montenegro
	\Czechia		\Netherlands

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\Denmark

\Norway

\Estonia

\Poland

\Finland

\Portugal

\France

\Romania

\Germany

\Serbia

\GreatBritain

\Slovakia

\Greece

\Slovenia

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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 538 scales each glyph to 72 pt. via an explicit `\fontsize{72}{72}`. An alternative is to specify the scaled package option to scale all country glyphs by a given factor of the font size.

Table 539: rojud Maps of Romanian Counties

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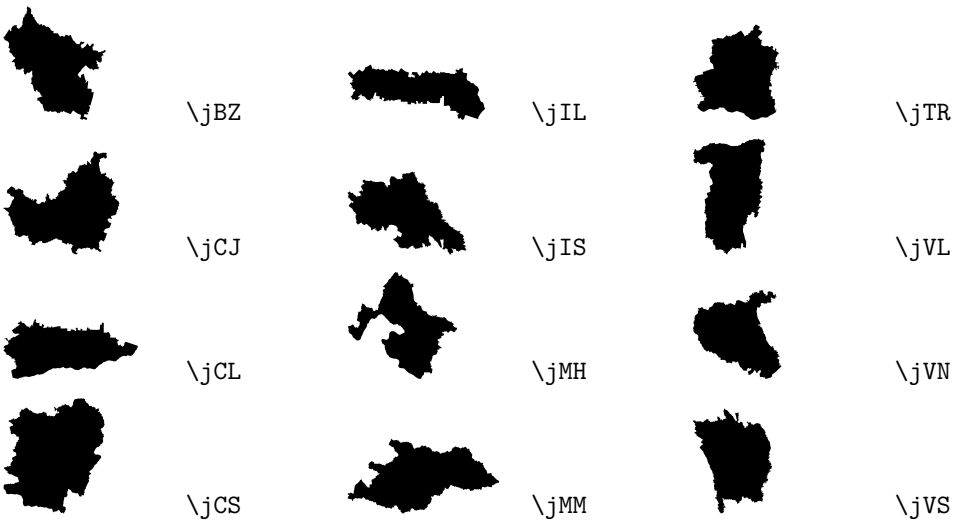

The preceding commands work only when the `rojud` font family is active. Use the OT1 font encoding in pdfLaTeX and the TU font encoding in XeLaTeX. (rojud requires one of those two TeX engines.) For example, "`{\usefont{OT1}{rojud}{m}{n}\jBI}`" draws Bucharest.[a]

[a] technically a municipality, not a county

Table 540: euflag European Union Flag

`\euflag`

The `\euflag` flag is drawn using the LaTeX `picture` environment.

Table 541: worldflags Flags of Sovereign States

	\worldflag{AD}		\worldflag{EC}		\worldflag{LC}		\worldflag{RW}
	\worldflag{AE}		\worldflag{EE}		\worldflag{LI}		\worldflag{SA}
	\worldflag{AF}		\worldflag{EG}		\worldflag{LK}		\worldflag{SB}
	\worldflag{AG}		\worldflag{ER}		\worldflag{LR}		\worldflag{SC}
	\worldflag{AL}		\worldflag{ES}		\worldflag{LS}		\worldflag{SD}
	\worldflag{AM}		\worldflag{ET}		\worldflag{LT}		\worldflag{SE}
	\worldflag{AO}		\worldflag{FI}		\worldflag{LU}		\worldflag{SG}
	\worldflag{AR}		\worldflag{FJ}		\worldflag{LV}		\worldflag{SI}
	\worldflag{AT}		\worldflag{FM}		\worldflag{LY}		\worldflag{SK}
	\worldflag{AU}		\worldflag{FR}		\worldflag{MA}		\worldflag{SL}
	\worldflag{AZ}		\worldflag{GA}		\worldflag{MD}		\worldflag{SM}
	\worldflag{BA}		\worldflag{GB}		\worldflag{ME}		\worldflag{SN}
	\worldflag{BB}		\worldflag{GD}		\worldflag{MG}		\worldflag{SO}
	\worldflag{BD}		\worldflag{GE}		\worldflag{MH}		\worldflag{SR}
	\worldflag{BE}		\worldflag{GH}		\worldflag{MK}		\worldflag{SS}
	\worldflag{BF}		\worldflag{GM}		\worldflag{ML}		\worldflag{ST}
	\worldflag{BG}		\worldflag{GN}		\worldflag{MM}		\worldflag{SV}
	\worldflag{BH}		\worldflag{GQ}		\worldflag{MN}		\worldflag{SY}
	\worldflag{BI}		\worldflag{GR}		\worldflag{MR}		\worldflag{SZ}
	\worldflag{BJ}		\worldflag{GT}		\worldflag{MT}		\worldflag{TD}
	\worldflag{BN}		\worldflag{GW}		\worldflag{MU}		\worldflag{TG}
	\worldflag{BO}		\worldflag{GY}		\worldflag{MV}		\worldflag{TH}
	\worldflag{BR}		\worldflag{HN}		\worldflag{MW}		\worldflag{TJ}
	\worldflag{BS}		\worldflag{HR}		\worldflag{MX}		\worldflag{TL}
	\worldflag{BT}		\worldflag{HT}		\worldflag{MY}		\worldflag{TM}
	\worldflag{BW}		\worldflag{HU}		\worldflag{MZ}		\worldflag{TN}
	\worldflag{BY}		\worldflag{ID}		\worldflag{NA}		\worldflag{TO}
	\worldflag{BZ}		\worldflag{IE}		\worldflag{NE}		\worldflag{TR}
	\worldflag{CA}		\worldflag{IL}		\worldflag{NG}		\worldflag{TT}
	\worldflag{CD}		\worldflag{IN}		\worldflag{NI}		\worldflag{TV}
	\worldflag{CF}		\worldflag{IQ}		\worldflag{NL}		\worldflag{TW}
	\worldflag{CG}		\worldflag{IR}		\worldflag{NO}		\worldflag{TZ}
	\worldflag{CH}		\worldflag{IS}		\worldflag{NP}		\worldflag{UA}
	\worldflag{CI}		\worldflag{IT}		\worldflag{NR}		\worldflag{UG}

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\worldflag{CK}	\worldflag{JM}	\worldflag{NZ}	\worldflag{US}
\worldflag{CL}	\worldflag{JO}	\worldflag{OM}	\worldflag{UY}
\worldflag{CM}	\worldflag{JP}	\worldflag{PA}	\worldflag{UZ}
\worldflag{CN}	\worldflag{KE}	\worldflag{PE}	\worldflag{VA}
\worldflag{CO}	\worldflag{KG}	\worldflag{PG}	\worldflag{VC}
\worldflag{CR}	\worldflag{KH}	\worldflag{PH}	\worldflag{VE}
\worldflag{CU}	\worldflag{KI}	\worldflag{PK}	\worldflag{VN}
\worldflag{CV}	\worldflag{KM}	\worldflag{PL}	\worldflag{VU}
\worldflag{CY}	\worldflag{KN}	\worldflag{PS}	\worldflag{WS}
\worldflag{CZ}	\worldflag{KO}	\worldflag{PT}	\worldflag{YE}
\worldflag{DE}	\worldflag{KP}	\worldflag{PW}	\worldflag{ZA}
\worldflag{DJ}	\worldflag{KR}	\worldflag{PY}	\worldflag{ZM}
\worldflag{DK}	\worldflag{KW}	\worldflag{QA}	\worldflag{ZW}
\worldflag{DM}	\worldflag{KZ}	\worldflag{RO}	
\worldflag{DO}	\worldflag{LA}	\worldflag{RS}	
\worldflag{DZ}	\worldflag{LB}	\worldflag{RU}	

All worldflags symbols are implemented with Ti*k*Z graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

Table 542: worldflags Flags of Non-Sovereign Countries and Territories

\worldflag{Abkhazia}	\worldflag{GF}	\worldflag{PR}
\worldflag{AQ}	\worldflag{GG}	\worldflag{RE}
\worldflag{Artsakh}	\worldflag{GI}	\worldflag{Saba}
\worldflag{AX}	\worldflag{GL}	\worldflag{Somaliland}
\worldflag{Bonaire}	\worldflag{IM}	\worldflag{StEustasius}
\worldflag{EH}	\worldflag{JE}	\worldflag{Tibet}
\worldflag{FO}	\worldflag{NU}	\worldflag{Transnistria}

All worldflags symbols are implemented with Ti*k*Z graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

Table 543: worldflags Flags of Austrian Federal States

\worldflag{AT-B}	\worldflag{AT-O}	\worldflag{AT-T}
\worldflag{AT-K}	\worldflag{AT-S}	\worldflag{AT-V}
\worldflag{AT-N}	\worldflag{AT-St}	\worldflag{AT-W}

All worldflags symbols are implemented with Ti*k*Z graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

Table 544: twemojis Flags

\twemoji{flag: Åland Islands}
\twemoji{flag: Afghanistan}
\twemoji{flag: Albania}
\twemoji{flag: Algeria}
\twemoji{flag: American Samoa}
\twemoji{flag: Andorra}
\twemoji{flag: Angola}
\twemoji{flag: Anguilla}
\twemoji{flag: Antarctica}
\twemoji{flag: Antigua & Barbuda}
\twemoji{flag: Argentina}
\twemoji{flag: Armenia}
\twemoji{flag: Aruba}
\twemoji{flag: Ascension Island}
\twemoji{flag: Australia}
\twemoji{flag: Austria}
\twemoji{flag: Azerbaijan}
\twemoji{flag: Bahamas}
\twemoji{flag: Bahrain}
\twemoji{flag: Bangladesh}
\twemoji{flag: Barbados}
\twemoji{flag: Belarus}
\twemoji{flag: Belgium}
\twemoji{flag: Belize}
\twemoji{flag: Benin}
\twemoji{flag: Bermuda}
\twemoji{flag: Bhutan}
\twemoji{flag: Bolivia}
\twemoji{flag: Bosnia & Herzegovina}
\twemoji{flag: Lesotho}
\twemoji{flag: Liberia}
\twemoji{flag: Libya}
\twemoji{flag: Liechtenstein}
\twemoji{flag: Lithuania}
\twemoji{flag: Luxembourg}
\twemoji{flag: Macao SAR China}
\twemoji{flag: Madagascar}
\twemoji{flag: Malawi}
\twemoji{flag: Malaysia}
\twemoji{flag: Maldives}
\twemoji{flag: Mali}
\twemoji{flag: Malta}
\twemoji{flag: Marshall Islands}
\twemoji{flag: Martinique}
\twemoji{flag: Mauritania}
\twemoji{flag: Mauritius}
\twemoji{flag: Mayotte}
\twemoji{flag: Mexico}
\twemoji{flag: Micronesia}
\twemoji{flag: Moldova}
\twemoji{flag: Monaco}
\twemoji{flag: Mongolia}
\twemoji{flag: Montenegro}
\twemoji{flag: Montserrat}
\twemoji{flag: Morocco}
\twemoji{flag: Mozambique}
\twemoji{flag: Myanmar (Burma)}
\twemoji{flag: Namibia}

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\twemoji{flag: Botswana}
\twemoji{flag: Bouvet Island}
\twemoji{flag: Brazil}
\twemoji{flag: British Indian Ocean Territory}
\twemoji{flag: British Virgin Islands}
\twemoji{flag: Brunei}
\twemoji{flag: Bulgaria}
\twemoji{flag: Burkina Faso}
\twemoji{flag: Burundi}
\twemoji{flag: Cambodia}
\twemoji{flag: Cameroon}
\twemoji{flag: Canada}
\twemoji{flag: Canary Islands}
\twemoji{flag: Cape Verde}
\twemoji{flag: Caribbean Netherlands}
\twemoji{flag: Cayman Islands}
\twemoji{flag: Central African Republic}
\twemoji{flag: Ceuta & Melilla}
\twemoji{flag: Chad}
\twemoji{flag: Chile}
\twemoji{flag: China}
\twemoji{flag: Christmas Island}
\twemoji{flag: Clipperton Island}
\twemoji{flag: Cocos (Keeling) Islands}
\twemoji{flag: Colombia}
\twemoji{flag: Comoros}
\twemoji{flag: Congo - Brazzaville}
\twemoji{flag: Congo - Kinshasa}
\twemoji{flag: Cook Islands}
\twemoji{flag: Costa Rica}
\twemoji{flag: Croatia}
\twemoji{flag: Cuba}
\twemoji{flag: Curaçao}
\twemoji{flag: Cyprus}
\twemoji{flag: Czechia}
\twemoji{flag: Côte d'Ivoire}
\twemoji{flag: Denmark}
\twemoji{flag: Diego Garcia}
\twemoji{flag: Djibouti}
\twemoji{flag: Nauru}
\twemoji{flag: Nepal}
\twemoji{flag: Netherlands}
\twemoji{flag: New Caledonia}
\twemoji{flag: New Zealand}
\twemoji{flag: Nicaragua}
\twemoji{flag: Nigeria}
\twemoji{flag: Niger}
\twemoji{flag: Niue}
\twemoji{flag: Norfolk Island}
\twemoji{flag: North Korea}
\twemoji{flag: North Macedonia}
\twemoji{flag: Northern Mariana Islands}
\twemoji{flag: Norway}
\twemoji{flag: Oman}
\twemoji{flag: Pakistan}
\twemoji{flag: Palau}
\twemoji{flag: Palestinian Territories}
\twemoji{flag: Panama}
\twemoji{flag: Papua New Guinea}
\twemoji{flag: Paraguay}
\twemoji{flag: Peru}
\twemoji{flag: Philippines}
\twemoji{flag: Pitcairn Islands}
\twemoji{flag: Poland}
\twemoji{flag: Portugal}
\twemoji{flag: Puerto Rico}
\twemoji{flag: Qatar}
\twemoji{flag: Romania}
\twemoji{flag: Russia}
\twemoji{flag: Rwanda}
\twemoji{flag: Réunion}
\twemoji{flag: Samoa}
\twemoji{flag: San Marino}
\twemoji{flag: Saudi Arabia}
\twemoji{flag: Scotland}
\twemoji{flag: Senegal}
\twemoji{flag: Serbia}
\twemoji{flag: Seychelles}

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\twemoji{flag: Dominican Republic}
\twemoji{flag: Dominica}
\twemoji{flag: Ecuador}
\twemoji{flag: Egypt}
\twemoji{flag: El Salvador}
\twemoji{flag: England}
\twemoji{flag: Equatorial Guinea}
\twemoji{flag: Eritrea}
\twemoji{flag: Estonia}
\twemoji{flag: Eswatini}
\twemoji{flag: Ethiopia}
\twemoji{flag: European Union}
\twemoji{flag: Falkland Islands}
\twemoji{flag: Faroe Islands}
\twemoji{flag: Fiji}
\twemoji{flag: Finland}
\twemoji{flag: France}
\twemoji{flag: French Guiana}
\twemoji{flag: French Polynesia}
\twemoji{flag: French Southern Territories}
\twemoji{flag: Gabon}
\twemoji{flag: Gambia}
\twemoji{flag: Georgia}
\twemoji{flag: Germany}
\twemoji{flag: Ghana}
\twemoji{flag: Gibraltar}
\twemoji{flag: Greece}
\twemoji{flag: Greenland}
\twemoji{flag: Grenada}
\twemoji{flag: Guadeloupe}
\twemoji{flag: Guam}
\twemoji{flag: Guatemala}
\twemoji{flag: Guernsey}
\twemoji{flag: Guinea-Bissau}
\twemoji{flag: Guinea}
\twemoji{flag: Guyana}
\twemoji{flag: Haiti}
\twemoji{flag: Heard & McDonald Islands}
\twemoji{flag: Honduras}
\twemoji{flag: Hong Kong SAR China}
\twemoji{flag: Sierra Leone}
\twemoji{flag: Singapore}
\twemoji{flag: Sint Maarten}
\twemoji{flag: Slovakia}
\twemoji{flag: Slovenia}
\twemoji{flag: Solomon Islands}
\twemoji{flag: Somalia}
\twemoji{flag: South Africa}
\twemoji{flag: South Georgia & South Sandwich Islands}
\twemoji{flag: South Korea}
\twemoji{flag: South Sudan}
\twemoji{flag: Spain}
\twemoji{flag: Sri Lanka}
\twemoji{flag: St. Barthélemy}
\twemoji{flag: St. Helena}
\twemoji{flag: St. Kitts & Nevis}
\twemoji{flag: St. Lucia}
\twemoji{flag: St. Martin}
\twemoji{flag: St. Pierre & Miquelon}
\twemoji{flag: St. Vincent & Grenadines}
\twemoji{flag: Sudan}
\twemoji{flag: Suriname}
\twemoji{flag: Svalbard & Jan Mayen}
\twemoji{flag: Sweden}
\twemoji{flag: Switzerland}
\twemoji{flag: Syria}
\twemoji{flag: São Tomé & Príncipe}
\twemoji{flag: Taiwan}
\twemoji{flag: Tajikistan}
\twemoji{flag: Tanzania}
\twemoji{flag: Thailand}
\twemoji{flag: Timor-Leste}
\twemoji{flag: Togo}
\twemoji{flag: Tokelau}
\twemoji{flag: Tonga}
\twemoji{flag: Trinidad & Tobago}
\twemoji{flag: Tristan da Cunha}
\twemoji{flag: Tunisia}
\twemoji{flag: Turkey}
\twemoji{flag: Turkmenistan}

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\twemoji{flag: Hungary}
\twemoji{flag: Iceland}
\twemoji{flag: India}
\twemoji{flag: Indonesia}
\twemoji{flag: Iran}
\twemoji{flag: Iraq}
\twemoji{flag: Ireland}
\twemoji{flag: Isle of Man}
\twemoji{flag: Israel}
\twemoji{flag: Italy}
\twemoji{flag: Jamaica}
\twemoji{flag: Japan}
\twemoji{flag: Jersey}
\twemoji{flag: Jordan}
\twemoji{flag: Kazakhstan}
\twemoji{flag: Kenya}
\twemoji{flag: Kiribati}
\twemoji{flag: Kosovo}
\twemoji{flag: Kuwait}
\twemoji{flag: Kyrgyzstan}
\twemoji{flag: Laos}
\twemoji{flag: Latvia}
\twemoji{flag: Lebanon}
\twemoji{flag: Turks & Caicos Islands}
\twemoji{flag: Tuvalu}
\twemoji{flag: U.S. Outlying Islands}
\twemoji{flag: U.S. Virgin Islands}
\twemoji{flag: Uganda}
\twemoji{flag: Ukraine}
\twemoji{flag: United Arab Emirates}
\twemoji{flag: United Kingdom}
\twemoji{flag: United Nations}
\twemoji{flag: United States}
\twemoji{flag: Uruguay}
\twemoji{flag: Uzbekistan}
\twemoji{flag: Vanuatu}
\twemoji{flag: Vatican City}
\twemoji{flag: Venezuela}
\twemoji{flag: Vietnam}
\twemoji{flag: Wales}
\twemoji{flag: Wallis & Futuna}
\twemoji{flag: Western Sahara}
\twemoji{flag: Yemen}
\twemoji{flag: Zambia}
\twemoji{flag: Zimbabwe}

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

Chapter 10

Other symbols

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

Table 545: textcomp Genealogical Symbols

⋆	\textborn	⚮	\textdivorced	⚭	\textmarried		
†	\textdied		\textleaf				

Table 546: wasysym General Symbols

◈	\ataribox	⌀	\diameter	ϟ	\lightning	☼	\sun
♦	\bell	▼	\DOWNarrow	☎	\phone	▲	\UParrow
☻	\blacksmiley	☹	\frownie	➪	\pointer	⌘	\wasycmd*
⋈	\Bowtie	⦸	\invdiameter	⌕	\recorder	⌑	\wasylozenge
¦	\brokenvert	✠	\kreuz	▶	\RIGHTarrow		
✓	\checked	◀	\LEFTarrow	↻	\rightturn		
◷	\clock	↺	\leftturn	☺	\smiley		

* wasysym defines \applecmd as a synonym for \wasycmd.

Table 547: utfsym Transportation Symbols

	\usym{1F3CD}		\usym{1F698}		\usym{1F6B2}		\usym{1F6CC}
	\usym{1F3CE}		\usym{1F699}		\usym{1F6B3}		\usym{1F6CD}
	\usym{1F680}		\usym{1F69A}		\usym{1F6B4}		\usym{1F6CE}
	\usym{1F681}		\usym{1F69B}		\usym{1F6B5}		\usym{1F6CF}
	\usym{1F682}		\usym{1F69C}		\usym{1F6B6}		\usym{1F6D0}
	\usym{1F683}		\usym{1F69D}		\usym{1F6B7}		\usym{1F6D1}
	\usym{1F684}		\usym{1F69E}		\usym{1F6B8}		\usym{1F6D2}
	\usym{1F685}		\usym{1F69F}		\usym{1F6B9}		\usym{1F6E0}
	\usym{1F686}		\usym{1F6A0}		\usym{1F6BA}		\usym{1F6E1}
	\usym{1F687}		\usym{1F6A1}		\usym{1F6BB}		\usym{1F6E2}
	\usym{1F688}		\usym{1F6A2}		\usym{1F6BC}		\usym{1F6E3}
	\usym{1F689}		\usym{1F6A3}		\usym{1F6BD}		\usym{1F6E4}
	\usym{1F68A}		\usym{1F6A4}		\usym{1F6BE}		\usym{1F6E5}
	\usym{1F68B}		\usym{1F6A5}		\usym{1F6BF}		\usym{1F6E6}
	\usym{1F68C}		\usym{1F6A6}		\usym{1F6C0}		\usym{1F6E7}
	\usym{1F68D}		\usym{1F6A7}		\usym{1F6C1}		\usym{1F6E8}
	\usym{1F68E}		\usym{1F6A8}		\usym{1F6C2}		\usym{1F6E9}
	\usym{1F68F}		\usym{1F6A9}		\usym{1F6C3}		\usym{1F6EA}
	\usym{1F690}		\usym{1F6AA}		\usym{1F6C4}		\usym{1F6EB}
	\usym{1F691}		\usym{1F6AB}		\usym{1F6C5}		\usym{1F6EC}
	\usym{1F692}		\usym{1F6AC}		\usym{1F6C6}		\usym{1F6F1}
	\usym{1F693}		\usym{1F6AD}		\usym{1F6C7}		\usym{1F6F2}
	\usym{1F694}		\usym{1F6AE}		\usym{1F6C8}		\usym{1F6F3}
	\usym{1F695}		\usym{1F6AF}		\usym{1F6C9}		\usym{1F6F4}
	\usym{1F696}		\usym{1F6B0}		\usym{1F6CA}		\usym{1F6F5}
	\usym{1F697}		\usym{1F6B1}		\usym{1F6CB}		\usym{1F6F6}

All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, "`\usymH{1F6F3}{36pt}`" produces

See the utfsym documentation for more information.

Table 548: manfnt Dangerous Bend Symbols

	\dbend		\lhdbend		\reversedvideodbend

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

Table 549: Miscellaneous manfnt Symbols

	\manboldkidney		\manpenkidney
	\manconcentriccircles		\manquadrifolium
	\manconcentricdiamond		\manquartercircle
	\mancone		\manrotatedquadrifolium
	\mancube		\manrotatedquartercircle
	\manerrarrow		\manstar
	\manfilledquartercircle		\mantiltpennib
	\manhpennib		\mantriangledown
	\manimpossiblecube		\mantriangleright
	\mankidney		\mantriangleup
	\manlhpenkidney		\manvpennib

Table 550: marvosym Media Control Symbols

▶	\Forward	▼	\MoveDown	⏮	\RewindToIndex	⤒	\ToTop
⏭	\ForwardToEnd	▲	\MoveUp	⏮	\RewindToStart		
⏭	\ForwardToIndex	◀	\Rewind	⤓	\ToBottom		

Table 551: typicons Media Control Symbols

	\tiEject		\tiMediaPlay		\tiMediaStop
	\tiEjectOutline		\tiMediaPlayOutline		\tiMediaStopOutline
	\tiMediaEject		\tiMediaPlayReverse		\tiPower
	\tiMediaEjectOutline		\tiMediaPlayReverseOutline		\tiPowerOutline
	\tiMediaFastForward		\tiMediaRecord		\tiVolume
	\tiMediaFastForwardOutline		\tiMediaRecordOutline		\tiVolumeDown
	\tiMediaPause		\tiMediaRewind		\tiVolumeMute
	\tiMediaPauseOutline		\tiMediaRewindOutline		\tiVolumeUp

typicons requires either LuaLaTeX or XeLaTeX.

Table 552: fontawesome5 Media Control Symbols

	\faBackward		\faPlayCircle		\faStopCircle[regular]
	\faEject		\faPlayCircle[regular]		\faVolumeDown
	\faFastBackward		\faStepBackward		\faVolumeMute
	\faFastForward		\faStepForward		\faVolumeOff
	\faForward		\faStop		\faVolumeUp
	\faPlay		\faStopCircle		

Table 553: utfsym Media Control Symbols

	\usym{1F500}		\usym{1F504}		\usym{1F508}		\usym{1F569}
	\usym{1F501}		\usym{1F505}		\usym{1F509}		\usym{1F56A}
	\usym{1F502}		\usym{1F506}		\usym{1F50A}		
	\usym{1F503}		\usym{1F507}		\usym{1F568}		

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

Table 554: typicons Left/Right Pointers

	\tiChevronLeft		\tiChevronRight
	\tiChevronLeftOutline		\tiChevronRightOutline

typicons requires either LuaLaTeX or XeLaTeX.

Table 555: fontawesome5 Up/Down/Left/Right Pointers

	\faAngleDoubleDown		\faCaretRight		\faChevronCircleDown
	\faAngleDoubleLeft		\faCaretSquareDown		\faChevronCircleLeft
	\faAngleDoubleRight		\faCaretSquareDown[regular]		\faChevronCircleRight
	\faAngleDoubleUp		\faCaretSquareLeft		\faChevronCircleUp
	\faAngleDown		\faCaretSquareLeft[regular]		\faChevronDown
	\faAngleLeft		\faCaretSquareRight		\faChevronLeft
	\faAngleRight		\faCaretSquareRight[regular]		\faChevronRight
	\faAngleUp		\faCaretSquareUp		\faChevronUp
	\faCaretDown		\faCaretSquareUp[regular]		
	\faCaretLeft		\faCaretUp		

Table 556: 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 557: Miscellaneous marvosym Symbols

†	\Ankh		\CircledA		\Industry		\PointingHand
	\Bat		\ClockLogo		\Info		\Smiley
	\Bicycle		\Coffeecup		\Ladiesroom		\Wheelchair
	\BOLogo	†	\Cross		\ManFace		\WomanFace
Hochschule Bochum Bochum University of Applied Sciences	\BOLogoL		\Football		\MineSign		\WritingHand
	\BOLogoP		\Frowny		\Mundus		\Yinyang
	\Bouquet		\Gentsroom	@	\MVAt		
	\Celtcross	♡	\Heart		\PeaceDove		

Table 558: Miscellaneous universa Symbols

\bauforms \bauhead

Table 559: Miscellaneous fourier Symbols

	\bomb		\noway		\textxswdown*	⚠	\warning
	\grimace		\textthing*		\textxswup*		

* fourier defines math-mode synonyms for a few of the preceding symbols: \thething (“”), \xswordsup (“”), and \xswordsdown (“”).

Table 560: utfsym Weather Symbols

	\usym{1F321}		\usym{1F324}		\usym{1F327}		\usym{1F32A}
	\usym{1F322}		\usym{1F325}		\usym{1F328}		\usym{1F32B}
	\usym{1F323}		\usym{1F326}		\usym{1F329}		\usym{1F32C}

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

Table 561: twemojis Weather Symbols

	\twemoji{cloud}		\twemoji{sun behind cloud}
	\twemoji{cloud with lightning}		\twemoji{sun behind large cloud}
	\twemoji{cloud with lightning and rain}		\twemoji{sun behind rain cloud}
	\twemoji{cloud with rain}		\twemoji{sun behind small cloud}
	\twemoji{cloud with snow}		\twemoji{thermometer}
	\twemoji{fog}		\twemoji{tornado}
	\twemoji{sun}		\twemoji{wind face}

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

Table 562: ifsym Weather Symbols

	\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 563: typicons Weather Symbols

	\tiThermometer		\tiWeatherPartlySunny		\tiWeatherSunny
	\tiWeatherCloudy		\tiWeatherShower		\tiWeatherWindy
	\tiWeatherDownpour		\tiWeatherSnow		\tiWeatherWindyCloudy
	\tiWeatherNight		\tiWeatherStormy		

typicons requires either LuaLaTeX or XeLaTeX.

Table 564: fontawesome5 Weather Symbols

	\faCloud		\faIcicles		\faThermometerEmpty
	\faCloudMeatball		\faSmog		\faThermometerFull
	\faCloudMoon		\faSnowflake		\faThermometerHalf
	\faCloudMoonRain		\faSnowflake[regular]		\faThermometerQuarter
	\faCloudRain		\faSun		\faThermometerThreeQuarters
	\faCloudShowersHeavy		\faSun[regular]		\faWind
	\faCloudSun		\faTemperatureHigh		
	\faCloudSunRain		\faTemperatureLow		

Table 565: figchild Weather Symbols

	\fcCloud		\fcCloudC		\fcSunB
	\fcCloudA		\fcSun		\fcThermometerA
	\fcCloudB		\fcSunA		\fcThermometerB

All figchild symbols are implemented with TikZ graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

Table 566: ifsym Alpine Symbols

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

Table 567: 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 568: utfsym Clocks

\usym{1F550}	\usym{1F557}	\usym{1F55E}	\usym{1F565}
\usym{1F551}	\usym{1F558}	\usym{1F55F}	\usym{1F566}
\usym{1F552}	\usym{1F559}	\usym{1F560}	\usym{1F567}
\usym{1F553}	\usym{1F55A}	\usym{1F561}	\usym{1F570}
\usym{1F554}	\usym{1F55B}	\usym{1F562}	
\usym{1F555}	\usym{1F55C}	\usym{1F563}	
\usym{1F556}	\usym{1F55D}	\usym{1F564}	

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

Table 569: clock Clocks

\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 \ClockFrametrue or \ClockFrametrue as illustrated above. See the clock documentation for more information.

Table 570: twemojis Clocks

	\twemoji{one o'clock}		\twemoji{eight-thirty}
	\twemoji{one-thirty}		\twemoji{nine o'clock}
	\twemoji{two o'clock}		\twemoji{nine-thirty}
	\twemoji{two-thirty}		\twemoji{ten o'clock}
	\twemoji{three o'clock}		\twemoji{ten-thirty}
	\twemoji{three-thirty}		\twemoji{eleven o'clock}
	\twemoji{four o'clock}		\twemoji{eleven-thirty}
	\twemoji{four-thirty}		\twemoji{twelve o'clock}
	\twemoji{five o'clock}		\twemoji{twelve-thirty}
	\twemoji{five-thirty}		\twemoji{alarm clock}
	\twemoji{six o'clock}		\twemoji{hourglass done}
	\twemoji{six-thirty}		\twemoji{hourglass not done}
	\twemoji{seven o'clock}		\twemoji{mantelpiece clock}
	\twemoji{seven-thirty}		\twemoji{stopwatch}
	\twemoji{eight o'clock}		\twemoji{timer clock}

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

Table 571: typicons Time and Date Symbols

	\tiCalendar		\tiStopwatch		\tiWatch
	\tiCalendarOutline		\tiTime		

typicons requires either LuaLaTeX or XeLaTeX.

Table 572: fontawesome5 Time and Date Symbols

	\faBusinessTime		\faCalendarMinus		\faClock[regular]
	\faCalendar*[regular]		\faCalendarMinus[regular]		\faDigitalTachograph
	\faCalendar*		\faCalendarPlus		\faHourglass
	\faCalendar		\faCalendarPlus[regular]		\faHourglass[regular]
	\faCalendar[regular]		\faCalendarTimes		\faHourglassEnd
	\faCalendarCheck		\faCalendarTimes[regular]		\faHourglassHalf
	\faCalendarCheck[regular]		\faCalendarWeek		\faHourglassStart
	\faCalendarDay		\faClock		\faTachometer*

Table 573: twemojis Animals

	\twemoji{ant}
	\twemoji{baby chick}
	\twemoji{badger}
	\twemoji{bat}
	\twemoji{bear}
	\twemoji{beaver}
	\twemoji{beetle}
	\twemoji{bird}
	\twemoji{black cat}
	\twemoji{blowfish}
	\twemoji{boar}
	\twemoji{bug}
	\twemoji{butterfly}
	\twemoji{cat face}
	\twemoji{cat2}
	\twemoji{chicken}
	\twemoji{chipmunk}
	\twemoji{cockroach}
	\twemoji{cow face}
	\twemoji{cow2}
	\twemoji{crab}
	\twemoji{cricket}
	\twemoji{crocodile}
	\twemoji{deer}
	\twemoji{dodo}
	\twemoji{dog face}
	\twemoji{dog2}
	\twemoji{dolphin}
	\twemoji{dragon}
	\twemoji{dragon face}
	\twemoji{dromedary camel}
	\twemoji{duck}
	\twemoji{eagle}
	\twemoji{elephant}
	\twemoji{fish}
	\twemoji{flamingo}
	\twemoji{fly}
	\twemoji{fox}
	\twemoji{frog}
	\twemoji{front-facing baby chick}
	\twemoji{giraffe}
	\twemoji{goat}
	\twemoji{gorilla}
	\twemoji{microbe}
	\twemoji{monkey}
	\twemoji{monkey face}
	\twemoji{mosquito}
	\twemoji{mouse face}
	\twemoji{mouse2}
	\twemoji{octopus}
	\twemoji{orangutan}
	\twemoji{otter}
	\twemoji{owl}
	\twemoji{ox}
	\twemoji{oyster}
	\twemoji{panda}
	\twemoji{parrot}
	\twemoji{paw prints}
	\twemoji{peacock}
	\twemoji{penguin}
	\twemoji{pig face}
	\twemoji{pig nose}
	\twemoji{pig2}
	\twemoji{polar bear}
	\twemoji{poodle}
	\twemoji{rabbit face}
	\twemoji{rabbit2}
	\twemoji{raccoon}
	\twemoji{racehorse}
	\twemoji{ram}
	\twemoji{rat}
	\twemoji{rhinoceros}
	\twemoji{rooster}
	\twemoji{sauropod}
	\twemoji{scorpion}
	\twemoji{seal}
	\twemoji{service dog}
	\twemoji{shark}
	\twemoji{sheep}
	\twemoji{shrimp}
	\twemoji{skunk}
	\twemoji{sloth}
	\twemoji{snail}
	\twemoji{snake}
	\twemoji{spiral shell}
	\twemoji{spouting whale}

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\twemoji{guide dog}
\twemoji{hamster}
\twemoji{hatching chick}
\twemoji{hedgehog}
\twemoji{hippopotamus}
\twemoji{honeybee}
\twemoji{horse face}
\twemoji{kangaroo}
\twemoji{koala}
\twemoji{lady beetle}
\twemoji{leopard}
\twemoji{lion}
\twemoji{lizard}
\twemoji{llama}
\twemoji{lobster}
\twemoji{mammoth}
\twemoji{squid}
\twemoji{swan}
\twemoji{T-Rex}
\twemoji{tiger face}
\twemoji{tiger2}
\twemoji{tropical fish}
\twemoji{turkey}
\twemoji{turtle}
\twemoji{two-hump camel}
\twemoji{unicorn}
\twemoji{water buffalo}
\twemoji{whale2}
\twemoji{wolf}
\twemoji{worm}
\twemoji{zebra}

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

Table 574: fontawesome5 Animals

\faBug
\faCat
\faCrow
\faDog
\faDove
\faDragon
\faFish
\faFrog
\faHippo
\faHorse
\faHorseHead
\faKiwiBird
\faOtter
\faSpider

Table 575: figchild Animals

	\fcAlligator		\fcGiraffeA
	\fcAlligatorA		\fcGiraffeB
	\fcAnt		\fcGiraffes
	\fcAntA		\fcGnat
	\fcAntelope		\fcGoose
	\fcArmadillo		\fcHerring
	\fcBat		\fcHippo
	\fcBear		\fcHorse
	\fcBearA		\fcHorseA
	\fcBearB		\fcHummingbird
	\fcBearC		\fcKittenA
	\fcBearD		\fcKittenB
	\fcBears		\fcKittensA
	\fcBee		\fcKittensB
	\fcBeeA		\fcLadybirdA
	\fcBird		\fcLadybirdB
	\fcBirdA		\fcLadyBug
	\fcBirdB		\fcLamb
	\fcBirdC		\fcLion
	\fcBirdD		\fcLionA
	\fcBirdE		\fcLittleBirds
	\fcBull		\fcLittleMouse

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\fcBunnyA

\fcBunnyB

\fcBunnyC

\fcBunnyD

\fcBunnyE

\fcButterfly

\fcButterflyA

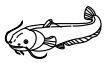
\fcButterflyB

\fcButterflyC

\fcCalf

\fcCat

\fcCaterpillar

 \fcCatfish

\fcCentipede

\fcChick

\fcChicken

\fcChicks

\fcCobrabebe

\fcCow

\fcCrabA

\fcCrabB

\fcDinosaurA

\fcDinosaurB

\fcLocust

\fcLouvadeus

\fcMacaw

\fcMonkey

\fcMonkeyA

\fcMoonfish

\fcMoose

\fcMouse

\fcMouseA

\fcMouseB

\fcOctopus

\fcOctopusA

\fcOrca

\fcOstrich

\fcOwl

\fcOwlA

\fcOwlB

\fcOx

\fcPandaBear

\fcParrot

\fcPeacock

\fcPenguin

\fcPerch

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\fcDinosaurC

\fcDinosaurD

\fcDinosaurE

\fcDinosaurF

\fcDinosaurG

\fcDinosaurH

\fcDinosaurI

\fcDinosaurJ

\fcDog

\fcDolphin

\fcDolphinA

\fcDragonFly

\fcDuck

\fcDuckA

\fcDuckB

\fcDuckC

\fcElephant

\fcElephantA

\fcElephantB

\fcFishA

\fcFishB

\fcFishC

\fcFishD

\fcPeruA

\fcPeruB

\fcPig

\fcPigA

\fcPigB

\fcPigC

\fcPigD

\fcPigE

\fcPuppy

\fcRabbit

\fcRabbitA

\fcRabbits

\fcRaccoon

\fcScorpion

\fcSeahorse

\fcShark

\fcSheep

\fcSheepA

\fcSheepB

\fcSheepC

\fcSnailA

\fcSnailB

\fcSnailC

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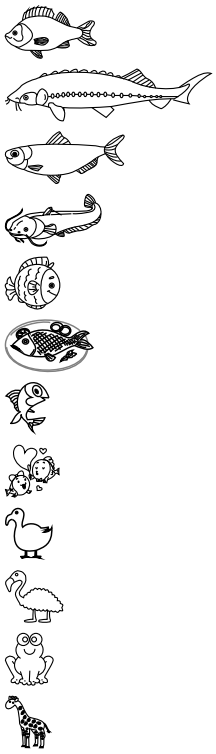
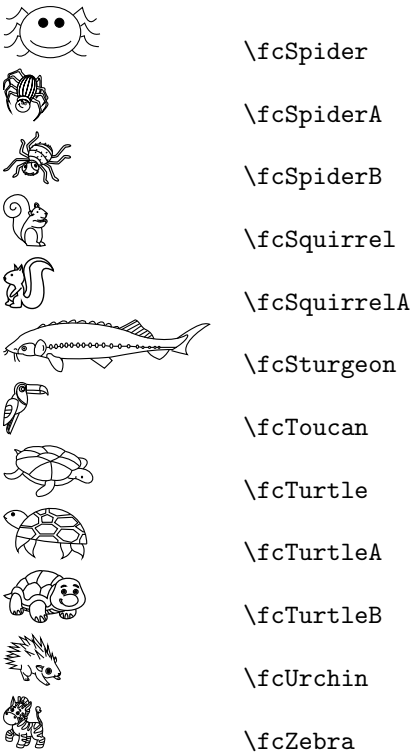


\fcFishE
\fcFishF
\fcFishG
\fcFishH
\fcFishI
\fcFishK
\fcFishL
\fcFishM
\fcFlamingo
\fcFlamingoA
\fcFrog
\fcGiraffe



\fcSpider
\fcSpiderA
\fcSpiderB
\fcSquirrel
\fcSquirrelA
\fcSturgeon
\fcToucan
\fcTurtle
\fcTurtleA
\fcTurtleB
\fcUrchin
\fcZebra

All figchild symbols are implemented with Ti*k*Z graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

Table 576: utfsym Animals

	\usym{1F400}		\usym{1F410}		\usym{1F420}		\usym{1F430}
	\usym{1F401}		\usym{1F411}		\usym{1F421}		\usym{1F431}
	\usym{1F402}		\usym{1F412}		\usym{1F422}		\usym{1F432}
	\usym{1F403}		\usym{1F413}		\usym{1F423}		\usym{1F433}
	\usym{1F404}		\usym{1F414}		\usym{1F424}		\usym{1F434}
	\usym{1F405}		\usym{1F415}		\usym{1F425}		\usym{1F435}
	\usym{1F406}		\usym{1F416}		\usym{1F426}		\usym{1F436}
	\usym{1F407}		\usym{1F417}		\usym{1F427}		\usym{1F437}
	\usym{1F408}		\usym{1F418}		\usym{1F428}		\usym{1F438}
	\usym{1F409}		\usym{1F419}		\usym{1F429}		\usym{1F439}
	\usym{1F40A}		\usym{1F41A}		\usym{1F42A}		\usym{1F43A}
	\usym{1F40B}		\usym{1F41B}		\usym{1F42B}		\usym{1F43B}
	\usym{1F40C}		\usym{1F41C}		\usym{1F42C}		\usym{1F43C}
	\usym{1F40D}		\usym{1F41D}		\usym{1F42D}		\usym{1F43F}
	\usym{1F40E}		\usym{1F41E}		\usym{1F42E}		
	\usym{1F40F}		\usym{1F41F}		\usym{1F42F}		

All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, "`\usymH{1F409}{36pt}`" produces

See the utfsym documentation for more information.

Table 577: hhcount Tally Markers

𝍸	`\fcscore{1}`	𝍹	`\fcscore{3}`	𝍼	`\fcscore{5}`
𝍷	`\fcscore{2}`	𝍺	`\fcscore{4}`		

The `\fcscore` command accepts values larger than 5. For example, "`\fcscore{47}`" produces "𝍼𝍼𝍼𝍼𝍼𝍼𝍼𝍼𝍼𝍼𝍼𝍼𝍼𝍼𝍷".

Table 578: ifsym Tally Markers

𝍸	`\StrokeOne`	𝍹	`\StrokeThree`	𝍼	`\StrokeFive`
𝍷	`\StrokeTwo`	𝍺	`\StrokeFour`		

Table 579: bullcntr Tally Markers

•	\bullcntr{⟨1⟩}	⁘	\bullcntr{⟨4⟩}	⁙	\bullcntr{⟨7⟩}
••	\bullcntr{⟨2⟩}	⁖	\bullcntr{⟨5⟩}	⁛	\bullcntr{⟨8⟩}
∴	\bullcntr{⟨3⟩}	⁙	\bullcntr{⟨6⟩}	⣿	\bullcntr{⟨9⟩}

The notation for \bullcntr used in the above bears explanation. \bullcntr does not take a number as its argument but rather a LaTeX counter, whose value it uses to typeset a tally marker. "\bullcntr{⟨3⟩}", for example, means to invoke \bullcntr with a counter whose value is 3. (\bullcntr usage is therefore akin to that of LaTeX's \fnsymbol.) The intention is to use \bullcntr indirectly via the bullenum package's bullenum environment, which is a variation on the enumerate environment that uses \bullcntr to typeset the labels.

To typeset individual tally markers, one can define a helper command:

```
\newcounter{bull}
\newcommand{\showbullcntr}[1]{%
  \setcounter{bull}{#1}%
  \bullcntr{bull}%
}
```

bullcntr's package options smallctrbull, largectrbull, and heartctrbull and corresponding commands \smallctrbull, \largectrbull, and \heartctrbull control the formatting of each tally marker:

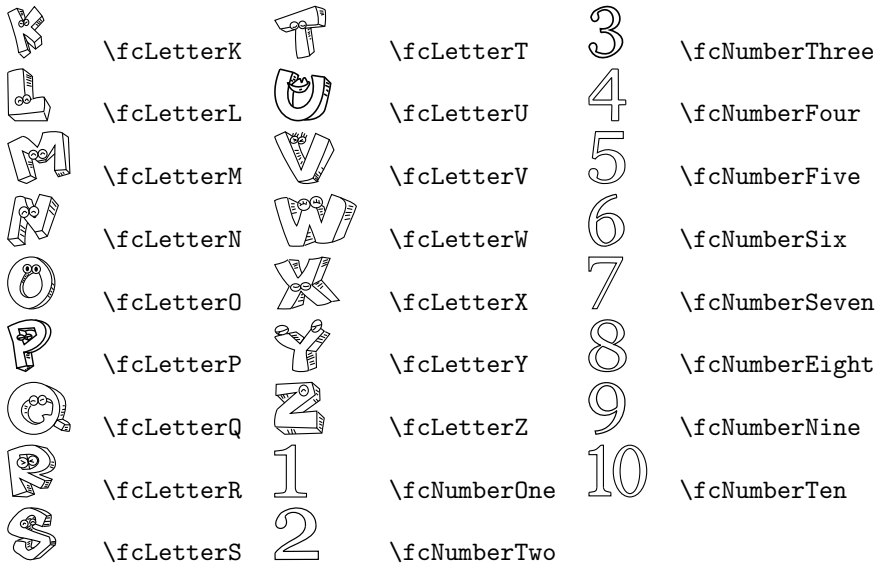
	small	large	heart
\bullcntr{⟨5⟩}	⁖	⁖	♡♡♡

The default is smartctrbull (\smartctrbull), which maps counter values 1–5 to large pips and 6–9 to small pips. It is also possible to use arbitrary symbols for \bullcntr's pips. See the bullcntr documentation for more information.

Table 580: dozenal Tally Markers

𝍸	\tally{1}	𝍹	\tally{3}	𝍺	\tally{5}
𝍻	\tally{2}	𝍼	\tally{4}	𝍽	\tally{6}

Table 581: figchild Letters and Digits



It's a mystery why figchild's alphabet begins with "K".

All figchild symbols are implemented with Ti*k*Z graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

Table 582: skull Symbols

☠ \skull

Table 583: Non-Mathematical mathabx Symbols

⸸ \rip

Table 584: Miscellaneous ifsym Symbols

❖	\FilledSectioningDiamond	✉	\Letter	☢	\Radiation
	\Fire		\PaperLandscape	❖	\SectioningDiamond
✕	\Irritant		\PaperPortrait	☎	\Telephone

Table 585: asapsym Signs

🚬	\asapCigaretteSign	🚫	\asapNotEmergencySign
🚫	\asapDogSign	🚫	\asapNotHelpSign
🚫	\asapDollarSign	🚫	\asapNotHospitalSign
🚫	\asapEmergencySign	🚫	\asapNotInformationSign
🚫	\asapHelpSign	🚫	\asapNotMobilePhoneSign
🚫	\asapHospitalSign	🚫	\asapNotParkingSign
🚫	\asapInformationSign	🚫	\asapNotSign
🚫	\asapMobilePhoneSign	🚫	\asapNotWalkSign
🚫	\asapNotCigaretteSign	🚫	\asapParkingSign
🚫	\asapNotDogSign	🚫	\asapWalkSign
🚫	\asapNotDollarSign		

asapsym requires either LuaLaTeX or XeLaTeX.

Table 586: metre Metrical Symbols

×	\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	⏓	\ma	⏓	\pm	⏔	\ps	⏓	\vppm
⏑⏑	\bb	⏑	\bm	⏑́	\Mb	:	\pp	:	\pxp	⁞	\vpppm
⏑́⏑	\bB	⏑́	\Bm	⏑	\mb	:	\Pp	:	\Pxp	::	\x
⏑⏑	\bba	|	\c	⏑́⏑	\mBb	⁘	\ppm	∼	\R		
⏑⏑	\bbb	|	\C	⏑́⏑	\mbB	⁞	\ppp	∼	\r		
⏑́⏑	\BBm	‖	\Cc	⏑⏑	\mbb	⁞	\Ppp	⊗	\T		

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

Table 587: 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 588: teubner Metrical Symbols

∞	\aeolicbii	⏒	\barbrevis	⏑	\ipercatal
∞∞	\aeolicbiii	⏑⏑	\bbrevis	–	\longa
∞∞∞	\aeolicbiv	⏑	\brevis	⏓	\ubarbbrevis
×	\anceps	⏑	\catal	⏓	\ubarbrevis
×̆	\ancepsdbrevis	⏑	\corona	⏓⏑	\ubarsbrevis
×̄	\banceps	⏑	\coronainv	⏒	\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 "–⏒⏒–⏒⏒–||–⏑⏑–⏑⏑–". See the teubner documentation for more information.

Table 589: hamnosys Hand Shapes

⊖	\hamceeall	⊔	\hamfingertwothree	⊓	\hamflathand
⊃	\hamceeonetwo	⊔	\hamfingertwothreefourfive	⊲	\hampinchall
∋	\hamceeopen	⊔	\hamfingertwothreespread	⊲	\hampinchonetwo
⊔	\hamfingertwo	⊂	\hamfist	⊲	\hampinchonetwoopen

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 590: hamnosys Hand-Shape Modifiers

⌃	\hamdoublebent	⌐	\hamfingerhookmod	⟋	\hamthumbopenmod
⌄	\hamdoublehooked	–	\hamfingerstraightmod	⟋	\hamthumboutmod
⌒	\hamfingerbendmod	~	\hamthumbacrossmod		

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 591: hamnosys Extended Finger Directions

⌄	\hamextfingerd	⌞	\hamextfingeril	›	\hamextfingerr
⌞	\hamextfingerdi	⌟	\hamextfingerir	⌃	\hamextfingeru
⌞	\hamextfingerdl	‹	\hamextfingerl	⌈	\hamextfingerui
⌊	\hamextfingerdo	⌃	\hamextfingero	⌈	\hamextfingerul
⌟	\hamextfingerdr	⌐	\hamextfingerol	⌉	\hamextfingeruo
⌄	\hamextfingeri	⌟	\hamextfingeror	⌉	\hamextfingerur

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 592: hamnosys Palm Orientations

	\hampalmd		\hampalmdr		\hampalmr		\hampalmul
	\hampalmdl		\hampalml		\hampalmu		\hampalmur

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 593: hamnosys Body Locations

	\hambelowstomach		\hamfingertip		\hampinkyside
	\hamcheek		\hamforehead		\hamringfinger
	\hamchest		\hamhandback		\hamshoulders
	\hamchin		\hamhead		\hamshouldertop
	\hamear		\hamheadtop		\hamstomach
	\hamearlobe		\hamindexfinger		\hamteeth
	\hamelbow		\hamlips		\hamthumb
	\hamelbowinside		\hamlowerarm		\hamthumbball
	\hameyebrows		\hammiddlefinger		\hamthumbside
	\hameyes		\hamneck		\hamtongue
	\hamfingerbase		\hamneutralspace		\hamunderchin
	\hamfingermidjoint		\hamnose		\hamupperarm
	\hamfingernail		\hamnostrils		\hamwristback
	\hamfingerpad		\hampalm		\hamwristpulse
	\hamfingerside		\hampinky		

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 594: hamnosys Location Modifiers

	\hamcorefref		\hamcoreftag		\hamlrat		\hamlrbeside

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 595: hamnosys Movements

◡	\hamarcd	⌕	\hamclockdl	↙	\hammoveil
◟	\hamarcl	⌕	\hamclockdr	↘	\hammoveir
◞	\hamarcr	⊕	\hamclockfull	←	\hammovel
◠	\hamarcu	↺	\hamclockl	↑	\hammoveo
↝	\hamarmextended	↻	\hamclockr	↖	\hammoveol
↶	\hambehind	↻	\hamclocku	↗	\hammoveor
↟	\hambrushing	↺	\hamclockul	→	\hammover
↺	\hamcircled	↻	\hamclockur	↑	\hammoveu
↺	\hamcircledi	)(	\hamclose	↖	\hammoveui
↺	\hamcircledl	×	\hamcross	↖	\hammoveul
↺	\hamcircledo	≥	\hamdecreasing	↗	\hammoveuo
↺	\hamcircledr	⬭	\hamellipseh	↗	\hammoveur
↺	\hamcirclei	⬮	\hamellipseul	⇵	\hamnodding
↺	\hamcircleil	⬯	\hamellipseur	⊘	\hamnomotion
↺	\hamcircleir	⬭	\hamellipsev	↦	\hamreplace
↺	\hamcirclel	*	\hamfast	↾	\hamrest
↺	\hamcircleo	✋	\hamfingerplay	–	\hamslow
↺	\hamcircleol	‖	\hamhalt	?	\hamstirccw
↺	\hamcircleor	∠	\hamincreasing	ʔ	\hamstircw
↺	\hamcircler	⬯	\haminterlock	↰↱	\hamswinging
↺	\hamcircleu	↓	\hammoved	✖	\hamtense
↺	\hamcircleui	↙	\hammovedi	ɣ	\hamtouch
↺	\hamcircleul	↙	\hammovedl	Ψ	\hamtwisting
↺	\hamcircleuo	↘	\hammovedo	〰	\hamwavy
↺	\hamcircleur	↘	\hammovedr	〰	\hamzigzag
⌕	\hamclockd	↓	\hammovei		

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 596: hamnosys Movement Modifiers

.	\hamlargemod	◦	\hamsmallmod

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 597: hamnosys Obsolete Spacing Symbols

✣	\hammovecross	⇀	\hamwristtoback	⇀	\hamwristtopulse
✠	\hammoveX	↱	\hamwristtopinky	↰	\hamwristtothumb

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 598: Miscellaneous hamnosys Symbols

∼	\hamalternatingmotion	⌿	\hamplus
\	\hambetween	⇻	\hamrepeatcontinue
…	\hametc	⇻	\hamrepeatcontinueseveral
⟨	\hamfusionbegin	+	\hamrepeatfromstart
⟩	\hamfusionend	⧺	\hamrepeatfromstartseveral
⋃	\hammime	↰	\hamrepeatreverse
∅	\hamnondominant	(	\hamseqbegin
ϟ	\hamnonipsi	)	\hamseqend
~	\hamorirelative	¨	\hamsymmlr
[	\hamparbegin	:	\hamsymmpar
]	\hamparend		

hamnosys requires either LuaLaTeX or XeLaTeX.

Table 599: dictsym Dictionary Symbols

	\dsaeronautical		\dscommercial		\dsmedical
	\dsagricultural		\dsheraldical		\dsmilitary
	\dsarchitectural		\dsjuridical		\dsrailways
	\dsbiological		\dsliterary		\dstechnical
	\dschemical		\dsmathematical		

Table 600: pmboxdraw Box-Drawing Symbols

	\textblock	╒	\textSFli	╦	\textSFxli	╣	\textSFxxiii
	\textdkshade	╓	\textSFlii	╠	\textSFxlii	║	\textSFxxiv
	\textdnblock	╫	\textSFliii	=	\textSFxliii	╗	\textSFxxv
	\textlfblock	╪	\textSFliv	╬	\textSFxliv	╝	\textSFxxvi
	\textltshade	┼	\textSFv	╚	\textSFxlix	╜	\textSFxxvii
	\textrtblock	┬	\textSFvi	╧	\textSFxlv	╛	\textSFxxviii
┌	\textSFi	┴	\textSFvii	╩	\textSFxlvi	╔	\textSFxxxix
└	\textSFii	├	\textSFviii	╤	\textSFxlvii	╞	\textSFxxxvi
┐	\textSFiii	─	\textSFx	╦	\textSFxlviii	╟	\textSFxxxvii
┘	\textSFiv	│	\textSFxi	╫	\textSFxx	╚	\textSFxxxviii
┤	\textSFix	╡	\textSFxix	╖	\textSFxxi		\textshade
╘	\textSFl	╨	\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 601: staves Magical Staves

	\staveI		\staveXXIV		\staveXLVII
	\staveII		\staveXXV		\staveXLVIII
	\staveIII		\staveXXVI		\staveXLIX
	\staveIV		\staveXXVII		\staveL
	\staveV		\staveXXVIII		\staveLI
	\staveVI		\staveXXIX		\staveLII
	\staveVII		\staveXXX		\staveLIII

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\staveVIII

\staveIX

\staveX

\staveXI

\staveXII

\staveXIII

\staveXIV

\staveXV

\staveXVI

\staveXVII

\staveXVIII

\staveXIX

\staveXX

\staveXXI

\staveXXII

\staveXXIII

\staveXXXI

\staveXXXII

\staveXXXIII

\staveXXXIV

\staveXXXV

\staveXXXVI

\staveXXXVII

\staveXXXVIII

\staveXXXIX

\staveXL

\staveXLI

\staveXLII

\staveXLIII

\staveXLIV

\staveXLV

\staveXLVI

\staveLIV

\staveLV

\staveLVI

\staveLVII

\staveLVIII

\staveLIX

\staveLX

\staveLXI

\staveLXII

\staveLXIII

\staveLXIV

\staveLXV

\staveLXVI

\staveLXVII

\staveLXVIII

The meanings of these symbols are described on the Web site for the Museum of Icelandic Sorcery and Witchcraft at `http://www.galdrasyning.is/index.php?option=com_content&task=category&sectionid=5&id=18&Itemid=60` (TinyURL: `http://tinyurl.com/25979m`). For example, `\staveL` (“ ”) is intended to ward off ghosts and evil spirits.

Table 602: pigpen Cipher Symbols

	{\pigpenfont A}		{\pigpenfont J}		{\pigpenfont S}
	{\pigpenfont B}		{\pigpenfont K}		{\pigpenfont T}
	{\pigpenfont C}		{\pigpenfont L}		{\pigpenfont U}
	{\pigpenfont D}		{\pigpenfont M}		{\pigpenfont V}
	{\pigpenfont E}		{\pigpenfont N}		{\pigpenfont W}
	{\pigpenfont F}		{\pigpenfont O}		{\pigpenfont X}
	{\pigpenfont G}		{\pigpenfont P}		{\pigpenfont Y}
	{\pigpenfont H}		{\pigpenfont Q}		{\pigpenfont Z}
	{\pigpenfont I}		{\pigpenfont R}		

Table 603: GiNA2e Phases of the Moon

	\MoonPha{1}		\MoonPha{2}		\MoonPha{3}		\MoonPha{4}

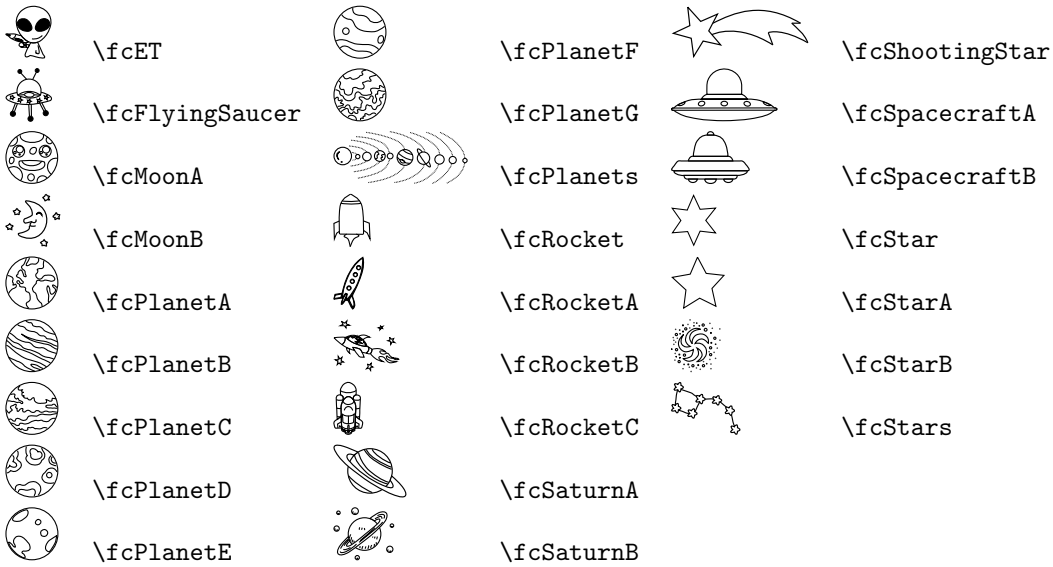
Table 604: twemojis Phases of the Moon

	\twemoji{crescent moon}		\twemoji{new moon}
	\twemoji{first quarter moon}		\twemoji{new moon face}
	\twemoji{first quarter moon face}		\twemoji{waning crescent moon}
	\twemoji{full moon}		\twemoji{waning gibbous moon}
	\twemoji{full moon face}		\twemoji{waxing crescent moon}
	\twemoji{last quarter moon}		\twemoji{waxing gibbous moon}
	\twemoji{last quarter moon face}		

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

Table 605: figchild Space Symbols



All figchild symbols are implemented with Ti*k*Z graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

Table 606: GiNA2e Recycling Symbols

♻	\Greenpoint

Table 607: marvosym Recycling Symbols

♻	\PackingWaste	♲	\Recycling

Table 608: utfsym Recycling Symbols

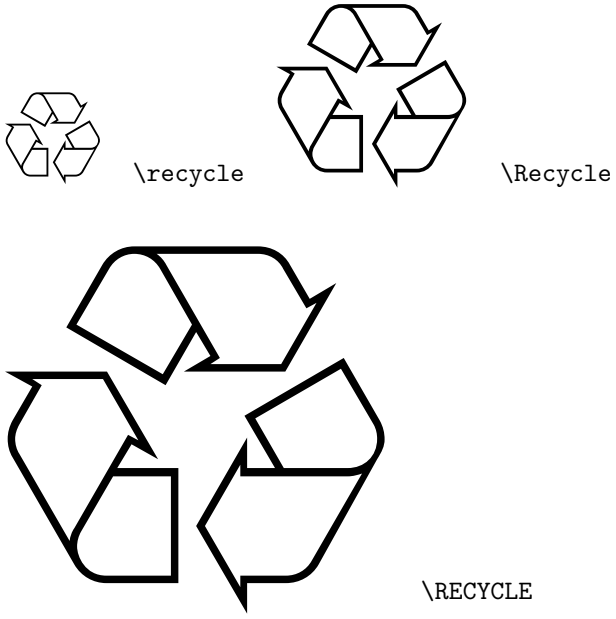
♲	\usym{2672}	♴	\usym{2676}	♺	\usym{267A}	♾	\usym{267E}
♳	\usym{2673}	♵	\usym{2677}	♻	\usym{267B}		
♴	\usym{2674}	♶	\usym{2678}	♼	\usym{267C}		
♵	\usym{2675}	♷	\usym{2679}	♽	\usym{267D}		

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

Table 609: fontawesome5 Recycling Symbols

♻ \faRecycle

Table 610: recycle Recycling Symbols



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 611: utfsym Plants and Flowers

	\usym{1F331}		\usym{1F337}		\usym{1F33C}		\usym{1F341}
	\usym{1F332}		\usym{1F338}		\usym{1F33D}		\usym{1F342}
	\usym{1F333}		\usym{1F339}		\usym{1F33E}		\usym{1F343}
	\usym{1F334}		\usym{1F33A}		\usym{1F33F}		\usym{1F3F5}
	\usym{1F335}		\usym{1F33B}		\usym{1F340}		\usym{1F3F6}

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

Table 612: utfsym Clothing

	\usym{1F451}		\usym{1F456}		\usym{1F45B}		\usym{1F460}
	\usym{1F452}		\usym{1F457}		\usym{1F45C}		\usym{1F461}
	\usym{1F453}		\usym{1F458}		\usym{1F45D}		\usym{1F462}
	\usym{1F454}		\usym{1F459}		\usym{1F45E}		
	\usym{1F455}		\usym{1F45A}		\usym{1F45F}		

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

Table 613: Miscellaneous LaTeX 2e Symbols

	`\Info`		`\Request`
	`\Postbox`		`\Telephone`

Table 614: soyombo Soyombo Symbols

	`\Soyombo`		`\sA`*		`\sO`*

* These symbols require that the Soyombo font be active ("`{\soyombo ... }`").

Table 615: 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{=}	m	\textknit{M}	⩛	\textknit{y}
⩚	\textknit{>}	m	\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 616: worldflags Nautical Symbol Flags

	\worldflag{A}		\worldflag{J}		\worldflag{S}		\worldflag{1}
	\worldflag{B}		\worldflag{K}		\worldflag{T}		\worldflag{2}
	\worldflag{C}		\worldflag{L}		\worldflag{U}		\worldflag{3}
	\worldflag{D}		\worldflag{M}		\worldflag{V}		\worldflag{4}
	\worldflag{E}		\worldflag{N}		\worldflag{W}		\worldflag{5}
	\worldflag{F}		\worldflag{O}		\worldflag{X}		\worldflag{6}
	\worldflag{G}		\worldflag{P}		\worldflag{Y}		\worldflag{7}
	\worldflag{H}		\worldflag{Q}		\worldflag{Z}		\worldflag{8}
	\worldflag{I}		\worldflag{R}		\worldflag{0}		\worldflag{9}

All worldflags symbols are implemented with Ti*k*Z graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

Table 617: Other worldflags Flags

	\worldflag{Buddhism}		\worldflag{NATO}		\worldflag{RedCrystal}
	\worldflag{Christian}		\worldflag{Olympics}		\worldflag{UNESCO}
	\worldflag{Esperanto}		\worldflag{Rainbow}		\worldflag{UNO}
	\worldflag{EU}		\worldflag{RedCrescent}		\worldflag{WB}
	\worldflag{JollyRoger}		\worldflag{RedCross}		\worldflag{WHO}

All worldflags symbols are implemented with Ti*k*Z graphics, not with a font. The package provides a number of options for controlling flag size and style. See the worldflags documentation for more information.

Table 618: twemojis Non-National Flags

	\twemoji{pirate flag}		\twemoji{transgender flag}
	\twemoji{rainbow flag}		

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

Table 619: fontawesome5 Flags

\faFlag		\faFlagCheckered	
\faFlag[regular]		\faFlagUsa	

Table 620: Miscellaneous arev Symbols

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

Table 621: twemojis Food Emoji

\twemoji{avocado}		\twemoji{hot beverage}	
\twemoji{bacon}		\twemoji{hot dog}	
\twemoji{bagel}		\twemoji{hot pepper}	
\twemoji{baguette bread}		\twemoji{ice}	
\twemoji{banana}		\twemoji{ice cream}	
\twemoji{beer mug}		\twemoji{kiwi fruit}	
\twemoji{bell pepper}		\twemoji{leafy green}	
\twemoji{bento box}		\twemoji{lemon}	
\twemoji{beverage box}		\twemoji{lollipop}	
\twemoji{blueberries}		\twemoji{mango}	
\twemoji{bottle with popping cork}		\twemoji{mate}	
\twemoji{bowl with spoon}		\twemoji{meat on bone}	
\twemoji{bread}		\twemoji{melon}	
\twemoji{broccoli}		\twemoji{moon cake}	
\twemoji{bubble tea}		\twemoji{mushroom}	
\twemoji{burrito}		\twemoji{oden}	
\twemoji{butter}		\twemoji{olive}	
\twemoji{candy}		\twemoji{onion}	
\twemoji{canned food}		\twemoji{pancakes}	
\twemoji{carrot}		\twemoji{peach}	
\twemoji{cheese wedge}		\twemoji{peanuts}	
\twemoji{cherries}		\twemoji{pear}	
\twemoji{chocolate bar}		\twemoji{pie}	
\twemoji{chopsticks}		\twemoji{pineapple}	
\twemoji{clinking beer mugs}		\twemoji{pizza}	
\twemoji{clinking glasses}		\twemoji{popcorn}	

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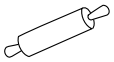
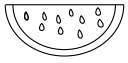
\twemoji{cocktail glass}
\twemoji{coconut}
\twemoji{cooked rice}
\twemoji{cookie}
\twemoji{cooking}
\twemoji{croissant}
\twemoji{cucumber}
\twemoji{cup with straw}
\twemoji{cupcake}
\twemoji{curry rice}
\twemoji{custard}
\twemoji{cut of meat}
\twemoji{dango}
\twemoji{doughnut}
\twemoji{dumpling}
\twemoji{egg}
\twemoji{eggplant}
\twemoji{falafel}
\twemoji{fish cake with swirl}
\twemoji{flatbread}
\twemoji{fondue}
\twemoji{fork and knife}
\twemoji{fork and knife with plate}
\twemoji{fortune cookie}
\twemoji{french fries}
\twemoji{fried shrimp}
\twemoji{garlic}
\twemoji{glass of milk}
\twemoji{grapes}
\twemoji{green apple}
\twemoji{green salad}
\twemoji{hamburger}
\twemoji{honey pot}
\twemoji{pot of food}
\twemoji{potato}
\twemoji{poultry leg}
\twemoji{pretzel}
\twemoji{red apple}
\twemoji{rice ball}
\twemoji{rice cracker}
\twemoji{roasted sweet potato}
\twemoji{sake}
\twemoji{salt}
\twemoji{sandwich}
\twemoji{shallow pan of food}
\twemoji{shaved ice}
\twemoji{shortcake}
\twemoji{soft ice cream}
\twemoji{spaghetti}
\twemoji{steaming bowl}
\twemoji{strawberry}
\twemoji{stuffed flatbread}
\twemoji{sushi}
\twemoji{taco}
\twemoji{takeout box}
\twemoji{tamale}
\twemoji{tangerine}
\twemoji{teacup without handle}
\twemoji{teapot}
\twemoji{tomato}
\twemoji{tropical drink}
\twemoji{tumbler glass}
\twemoji{waffle}
\twemoji{watermelon}
\twemoji{wine glass}

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

Table 622: figchild Food and Cooking Symbols

	\fcApple		\fcFrenchFries		\fcPimento
	\fcBarbecue		\fcFridge		\fcPineapple
	\fcBread		\fchamburger		\fcPopsicle
	\fcBrownie		\fcIceCreamA		\fcPotato
	\fcBullet		\fcIceCreamB		\fcPulse
	\fcBurrito		\fcIceCreamC		\fcRoastChicken
	\fcCabbage		\fcIceCreamD		\fcRoller
	\fcCarrot		\fcIceCreamE		\fcScallion
	\fcCarrotA		\fcIceCreamF		\fcScaredEgg
	\fcCashier		\fcIceCreamG		\fcSharpKnife
	\fcCheese		\fcIceCreamH		\fcShell
	\fcCherry		\fcKetchup		\fcShrimp
	\fcChickenThigh		\fcKettle		\fcSpatulas
	\fcCucumber		\fcKnife		\fcSteak
	\fcCupcake		\fcMug		\fcStrawberry
	\fcCupcakeA		\fcMushroom		\fcStrawberryA
	\fcCupcakeB		\fcMushroomA		\fcSugar
	\fcCuttingBoard		\fcMushroomB		\fcTomato
	\fcEgg		\fcNuggets		\fcTony
	\fcEggA		\fcOnion		\fcWatermelon
	\fcEggB		\fcPanA		

`\fcEggplant` `\fcPanB`

All figchild symbols are implemented with Ti*k*Z graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

Table 623: utfsym Food and Cooking Symbols

	`\usym{1F32D}`		`\usym{1F350}`		`\usym{1F362}`		`\usym{1F372}`
	`\usym{1F32E}`		`\usym{1F351}`		`\usym{1F363}`		`\usym{1F373}`
	`\usym{1F32F}`		`\usym{1F352}`		`\usym{1F364}`		`\usym{1F374}`
	`\usym{1F336}`		`\usym{1F353}`		`\usym{1F365}`		`\usym{1F375}`
	`\usym{1F344}`		`\usym{1F354}`		`\usym{1F366}`		`\usym{1F376}`
	`\usym{1F345}`		`\usym{1F355}`		`\usym{1F367}`		`\usym{1F377}`
	`\usym{1F346}`		`\usym{1F356}`		`\usym{1F368}`		`\usym{1F378}`
	`\usym{1F347}`		`\usym{1F357}`		`\usym{1F369}`		`\usym{1F379}`
	`\usym{1F348}`		`\usym{1F35A}`		`\usym{1F36A}`		`\usym{1F37A}`
	`\usym{1F349}`		`\usym{1F35B}`		`\usym{1F36B}`		`\usym{1F37B}`
	`\usym{1F34A}`		`\usym{1F35C}`		`\usym{1F36C}`		`\usym{1F37C}`
	`\usym{1F34B}`		`\usym{1F35D}`		`\usym{1F36D}`		`\usym{1F37D}`
	`\usym{1F34C}`		`\usym{1F35E}`		`\usym{1F36E}`		`\usym{1F37E}`
	`\usym{1F34D}`		`\usym{1F35F}`		`\usym{1F36F}`		`\usym{1F37F}`
	`\usym{1F34E}`		`\usym{1F360}`		`\usym{1F370}`		`\usym{1F382}`
	`\usym{1F34F}`		`\usym{1F361}`		`\usym{1F371}`		

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

Table 624: cookingsymbols Cooking Symbols

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

Table 625: tikzsymbols Cooking Symbols

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

tikzsymbols defines German-language aliases for each of the above: \Backblech for \bakingplate, \Bratpfanne for \fryingpan, \Dreizack for \trident, \Flasche for \bottle, \Herd for \cooker, \Kochtopf for \pot, \Knoblauchpresse for \garlicpress, \Nudelholz for \rollingpin, \Ofen for \oven, \Pfanne for \pan, \Purierstab for \blender, \Reibe for \grater, \Saftpresse for \squeezer, \Schaler for \peeler, \Schneebesen for \eggbeater, \Schussel for \bowl, and \Sieb for \sieve.

All tikzsymbols symbols are implemented with TikZ graphics, not with a font.

Table 626: tikzsymbols Emoji

	\Annoey		\Laughey		\rWalley		\Tongey
	\Cat		\Neutrey		\Sadey		\Vomey
	\cChangey{1}		\NiceReapey		\SchrodingersCat{0}		\Walley
	\Changey{1}		\Ninja		\Sey		\Winkey
	\Cooley		\Nursey		\Sleepey		\wInnocey
	\Innocey		\oldWinkey		\Smiley		\Xey

All tikzsymbols symbols are implemented with TikZ graphics, not with a font. Hence, symbols like \Ninja can include color. In fact, most of the commands shown above accept one or more color arguments for further customization. Also note that \cChangey, \Changey, and \SchrodingersCat take a mandatory argument. See the tikzsymbols documentation for more information.

Table 627: tikzsymbols 3D Emoji

	\dAnnoey		\dLaughey		\dSadey		\dVomey
	\dcChangey{1}		\dNeutrey		\dSey		\dWalley
	\dChangey{1}		\dNinja		\dSleepey		\dWinkey
	\dCooley		\dNursey		\dSmiley		\dXey
	\dInnocey		\drWalley		\dTongey		\olddWinkey

All tikzsymbols symbols are implemented with TikZ graphics, not with a font. Hence, all of the symbols shown above can include color. In fact, each command in Table 627 accepts one or more color arguments for further customization. Note that \dcChangey and \dChangey also take a mandatory argument. See the tikzsymbols documentation for more information.

Table 628: utfsym Emoji

😀	\usym{1F600}	😔	\usym{1F614}	😨	\usym{1F628}	😼	\usym{1F63C}
😁	\usym{1F601}	😕	\usym{1F615}	😩	\usym{1F629}	😽	\usym{1F63D}
😂	\usym{1F602}	😖	\usym{1F616}	😪	\usym{1F62A}	😾	\usym{1F63E}
😃	\usym{1F603}	😗	\usym{1F617}	😫	\usym{1F62B}	😿	\usym{1F63F}
😄	\usym{1F604}	😘	\usym{1F618}	😬	\usym{1F62C}	🙀	\usym{1F640}
😅	\usym{1F605}	😙	\usym{1F619}	😭	\usym{1F62D}	🙁	\usym{1F641}
😆	\usym{1F606}	😚	\usym{1F61A}	😮	\usym{1F62E}	🙂	\usym{1F642}
😇	\usym{1F607}	😛	\usym{1F61B}	😯	\usym{1F62F}	🙃	\usym{1F643}
😈	\usym{1F608}	😜	\usym{1F61C}	😰	\usym{1F630}	🙄	\usym{1F644}
😉	\usym{1F609}	😝	\usym{1F61D}	😱	\usym{1F631}	🙅	\usym{1F645}
😊	\usym{1F60A}	😞	\usym{1F61E}	😲	\usym{1F632}	🙆	\usym{1F646}
😋	\usym{1F60B}	😟	\usym{1F61F}	😳	\usym{1F633}	🙇	\usym{1F647}
😌	\usym{1F60C}	😠	\usym{1F620}	😵	\usym{1F634}	🙈	\usym{1F648}
😍	\usym{1F60D}	😡	\usym{1F621}	😶	\usym{1F635}	🙉	\usym{1F649}
😎	\usym{1F60E}	😢	\usym{1F622}	😷	\usym{1F636}	🙊	\usym{1F64A}
😏	\usym{1F60F}	😣	\usym{1F623}	😸	\usym{1F637}	🙋	\usym{1F64B}
😐	\usym{1F610}	😤	\usym{1F624}	😹	\usym{1F638}	🙌	\usym{1F64C}
😑	\usym{1F611}	😥	\usym{1F625}	😺	\usym{1F639}	🙍	\usym{1F64D}
😒	\usym{1F612}	😦	\usym{1F626}	😻	\usym{1F63A}	🙎	\usym{1F64E}
😓	\usym{1F613}	😧	\usym{1F627}	😼	\usym{1F63B}	🙏	\usym{1F64F}

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

Table 629: tikzsymbols Trees

	\Autumntree		\Summertree		\WorstTree
	\Springtree		\Wintertree		

All tikzsymbols symbols are implemented with Ti*k*Z graphics, not with a font. Hence, all of the symbols shown above can include color. tikzsymbols additionally defines a `\BasicTree` command that supports customization of trunk and leaf colors. See the tikzsymbols documentation for more information.

Table 630: utfsym Love Symbols

❤	\usym{1F394}	💐	\usym{1F490}	💖	\usym{1F496}	💜	\usym{1F49C}
💋	\usym{1F48B}	💑	\usym{1F491}	💗	\usym{1F497}	💝	\usym{1F49D}
💌	\usym{1F48C}	💒	\usym{1F492}	💘	\usym{1F498}	💞	\usym{1F49E}
💍	\usym{1F48D}	💓	\usym{1F493}	💙	\usym{1F499}	💟	\usym{1F49F}
💎	\usym{1F48E}	💔	\usym{1F494}	💚	\usym{1F49A}	🕊	\usym{1F54A}
💏	\usym{1F48F}	💕	\usym{1F495}	💛	\usym{1F49B}	🖤	\usym{1F5A4}

All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to `\usym`, the utfsym package defines `\usymH`, which renders a symbol at a given height, and `\usymW`, which renders a symbol at a given width. For example, "`\usymH{1F492}{36pt}`" produces

See the utfsym documentation for more information.

Table 631: Miscellaneous tikzsymbols Symbols

🛏	`\Bed`	🪑	`\Chair`	🔥	`\Fire`	☃	`\Snowman`	🛆	`\Tribar`
🕯	`\Candle`	☕	`\Coffeecup`	🗿	`\Moai`	🧍	`\Strichmaxerl`		

All tikzsymbols symbols are implemented with Ti*k*Z graphics, not with a font. `\Tribar` supports customization of the fill color for each bar. `\Strichmaxerl` supports customization of the angles at which the stick figure's arms and legs are drawn. See the tikzsymbols documentation for more information.

Table 632: Miscellaneous twemojis Emoji

🇦	`\twemoji{1f1e6}`	🧘	`\twemoji{man in lotus position}`*
🇧	`\twemoji{1f1e7}`	👨‍🦽	`\twemoji{man in manual wheelchair}`*
🇨	`\twemoji{1f1e8}`	👨‍🦼	`\twemoji{man in motorized wheelchair}`*
🇩	`\twemoji{1f1e9}`	🧖	`\twemoji{man in steamy room}`*
🇪	`\twemoji{1f1ea}`	🤵	`\twemoji{man in tuxedo}`*
🇫	`\twemoji{1f1eb}`	👨‍⚖️	`\twemoji{man judge}`*

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\twemoji{1f1ec}
\twemoji{1f1ed}
\twemoji{1f1ee}
\twemoji{1f1ef}
\twemoji{1f1f0}
\twemoji{1f1f1}
\twemoji{1f1f2}
\twemoji{1f1f3}
\twemoji{1f1f4}
\twemoji{1f1f5}
\twemoji{1f1f6}
\twemoji{1f1f7}
\twemoji{1f1f8}
\twemoji{1f1f9}
\twemoji{1f1fa}
\twemoji{1f1fb}
\twemoji{1f1fc}
\twemoji{1f1fd}
\twemoji{1f1fe}
\twemoji{1f1ff}
\twemoji{1f468-1f3fb-200d-1f384}
\twemoji{1f468-1f3fc-200d-1f384}
\twemoji{1f468-1f3fd-200d-1f384}
\twemoji{1f468-1f3fe-200d-1f384}
\twemoji{1f468-1f3ff-200d-1f384}
\twemoji{1f468-200d-1f384}
\twemoji{1f469-1f3fb-200d-1f384}
\twemoji{1f469-1f3fc-200d-1f384}
\twemoji{1f469-1f3fd-200d-1f384}
\twemoji{1f469-1f3fe-200d-1f384}
\twemoji{1f469-1f3ff-200d-1f384}
\twemoji{1f469-200d-1f384}
\twemoji{1f574-1f3fb-200d-2640-fe0f}
\twemoji{1f574-1f3fb-200d-2642-fe0f}
\twemoji{1f574-1f3fc-200d-2640-fe0f}
\twemoji{1f574-1f3fc-200d-2642-fe0f}
\twemoji{1f574-1f3fd-200d-2640-fe0f}
\twemoji{1f574-1f3fd-200d-2642-fe0f}
\twemoji{1f574-1f3fe-200d-2640-fe0f}
\twemoji{1f574-1f3fe-200d-2642-fe0f}
\twemoji{1f574-1f3ff-200d-2640-fe0f}
\twemoji{1f574-1f3ff-200d-2642-fe0f}
\twemoji{1f574-fe0f-200d-2640-fe0f}
\twemoji{1f574-fe0f-200d-2642-fe0f}
\twemoji{1f576}
\twemoji{1f6cf}
\twemoji{man juggling}*
\twemoji{man kneeling}*
\twemoji{man lifting weights}*
\twemoji{man mage}*
\twemoji{man mechanic}*
\twemoji{man office worker}*
\twemoji{man pilot}*
\twemoji{man playing handball}*
\twemoji{man playing water polo}*
\twemoji{man police officer}*
\twemoji{man pouting}*
\twemoji{man raising hand}*
\twemoji{man running}*
\twemoji{man scientist}*
\twemoji{man shrugging}*
\twemoji{man singer}*
\twemoji{man standing}*
\twemoji{man student}*
\twemoji{man superhero}*
\twemoji{man supervillain}*
\twemoji{man surfing}*
\twemoji{man swimming}*
\twemoji{man teacher}*
\twemoji{man technologist}*
\twemoji{man tipping hand}*
\twemoji{man vampire}*
\twemoji{man walking}*
\twemoji{man wearing turban}*
\twemoji{man with veil}*
\twemoji{man with white cane}*
\twemoji{man zombie}
\twemoji{man's shoe}
\twemoji{manual wheelchair}
\twemoji{map of Japan}
\twemoji{maple leaf}
\twemoji{martial arts uniform}
\twemoji{mechanic}*
\twemoji{mechanical arm}
\twemoji{mechanical leg}
\twemoji{medical symbol}
\twemoji{medium skin tone}
\twemoji{medium-dark skin tone}
\twemoji{medium-light skin tone}
\twemoji{megaphone}
\twemoji{men holding hands}*
\twemoji{men with bunny ears}

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\twemoji{1st place medal}
\twemoji{26f7-1f3fb}
\twemoji{26f7-1f3fc}
\twemoji{26f7-1f3fd}
\twemoji{26f7-1f3fe}
\twemoji{26f7-1f3ff}
\twemoji{270f}
\twemoji{2nd place medal}
\twemoji{3rd place medal}
\twemoji{A button (blood type)}
\twemoji{AB button (blood type)}
\twemoji{abacus}
\twemoji{accordion}
\twemoji{adhesive bandage}
\twemoji{admission tickets}
\twemoji{alembic}
\twemoji{alien}
\twemoji{alien monster}
\twemoji{american football}
\twemoji{amphora}
\twemoji{anatomical heart}
\twemoji{anchor}
\twemoji{anger symbol}
\twemoji{angry face}
\twemoji{angry face with horns}
\twemoji{anguished face}
\twemoji{antenna bars}
\twemoji{anxious face with sweat}
\twemoji{Aquarius}
\twemoji{Aries}
\twemoji{artist}*
\twemoji{artist palette}
\twemoji{astonished face}
\twemoji{astronaut}*
\twemoji{ATM sign}
\twemoji{atom symbol}
\twemoji{axe}
\twemoji{B button (blood type)}
\twemoji{baby}*
\twemoji{baby angel}*
\twemoji{baby bottle}
\twemoji{baby symbol}
\twemoji{BACK arrow}
\twemoji{backhand index pointing down}*
\twemoji{men wrestling}
\twemoji{men's room}
\twemoji{menorah}
\twemoji{mermaid}*
\twemoji{merman}*
\twemoji{merperson}*
\twemoji{microphone}
\twemoji{microscope}
\twemoji{middle finger}*
\twemoji{military helmet}
\twemoji{military medal}
\twemoji{milky way}
\twemoji{minus}
\twemoji{mirror}
\twemoji{mobile phone}
\twemoji{mobile phone off}
\twemoji{mobile phone with arrow}
\twemoji{money bag}
\twemoji{money with wings}
\twemoji{money-mouth face}
\twemoji{moon viewing ceremony}
\twemoji{mosque}
\twemoji{motorized wheelchair}
\twemoji{mount fuji}
\twemoji{mountain}
\twemoji{mouse trap}
\twemoji{mouth}
\twemoji{movie camera}
\twemoji{moyai}
\twemoji{Mrs. Claus}*
\twemoji{multiply}
\twemoji{musical keyboard}
\twemoji{musical note}
\twemoji{musical notes}
\twemoji{musical score}
\twemoji{muted speaker}
\twemoji{mx claus}*
\twemoji{nail polish}*
\twemoji{name badge}
\twemoji{national park}
\twemoji{nauseated face}
\twemoji{nazar amulet}
\twemoji{necktie}
\twemoji{nerd face}

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- \twemoji{backhand index pointing left}*
- \twemoji{backhand index pointing right}*
- \twemoji{backhand index pointing up}*
- \twemoji{backpack}
- \twemoji{badminton}
- \twemoji{balance scale}
- \twemoji{bald}
- \twemoji{ballet shoes}
- \twemoji{balloon}
- \twemoji{ballot box with ballot}
- \twemoji{banjo}
- \twemoji{bank}
- \twemoji{bar chart}
- \twemoji{barber pole}
- \twemoji{baseball}
- \twemoji{basket}
- \twemoji{basketball}
- \twemoji{bathtub}
- \twemoji{battery}
- \twemoji{beach with umbrella}
- \twemoji{beaming face with smiling eyes}
- \twemoji{beating heart}
- \twemoji{bell}
- \twemoji{bell with slash}
- \twemoji{bellhop bell}
- \twemoji{bikini}
- \twemoji{billed cap}
- \twemoji{biohazard}
- \twemoji{birthday cake}
- \twemoji{bison}
- \twemoji{black circle}
- \twemoji{black flag}
- \twemoji{black heart}
- \twemoji{black large square}
- \twemoji{black medium square}
- \twemoji{black medium-small square}
- \twemoji{black nib}
- \twemoji{black small square}
- \twemoji{black square button}
- \twemoji{nesting dolls}
- \twemoji{neutral face}
- \twemoji{NEW button}
- \twemoji{newspaper}
- \twemoji{next track button}
- \twemoji{NG button}
- \twemoji{night with stars}
- \twemoji{ninja}*
- \twemoji{no entry}
- \twemoji{no littering}
- \twemoji{no mobile phones}
- \twemoji{no one under eighteen}
- \twemoji{no pedestrians}
- \twemoji{no smoking}
- \twemoji{non-potable water}
- \twemoji{nose}*
- \twemoji{notebook}
- \twemoji{notebook with decorative cover}
- \twemoji{nut and bolt}
- \twemoji{O button (blood type)}
- \twemoji{office building}
- \twemoji{office worker}*
- \twemoji{ogre}
- \twemoji{oil drum}
- \twemoji{OK button}
- \twemoji{OK hand}*
- \twemoji{old key}
- \twemoji{old man}*
- \twemoji{old woman}*
- \twemoji{older person}*
- \twemoji{om}
- \twemoji{ON! arrow}
- \twemoji{oncoming fist}*
- \twemoji{one-piece swimsuit}
- \twemoji{open book}
- \twemoji{open file folder}
- \twemoji{open hands}*
- \twemoji{open mailbox with lowered flag}
- \twemoji{open mailbox with raised flag}

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\twemoji{blossom}
\twemoji{blue book}
\twemoji{blue circle}
\twemoji{blue heart}
\twemoji{blue square}
\twemoji{bomb}
\twemoji{bone}
\twemoji{bookmark}
\twemoji{bookmark tabs}
\twemoji{books}
\twemoji{boomerang}
\twemoji{bouquet}
\twemoji{bow and arrow}
\twemoji{bowling}
\twemoji{boxing glove}
\twemoji{boy}*
\twemoji{brain}
\twemoji{breast-feeding}*
\twemoji{bricks}
\twemoji{bridge at night}
\twemoji{briefcase}
\twemoji{briefs}
\twemoji{bright button}
\twemoji{broken heart}
\twemoji{broom}
\twemoji{brown circle}
\twemoji{brown heart}
\twemoji{brown square}
\twemoji{bucket}
\twemoji{building construction}
\twemoji{bullseye}
\twemoji{bust in silhouette}
\twemoji{busts in silhouette}
\twemoji{cactus}
\twemoji{call me hand}*
\twemoji{camera}
\twemoji{camera with flash}
\twemoji{camping}
\twemoji{Cancer}
\twemoji{candle}
\twemoji{Capricorn}
\twemoji{card file box}
\twemoji{card index}
\twemoji{card index dividers}
\twemoji{carousel horse}
\twemoji{carp streamer}
\twemoji{Ophiuchus}
\twemoji{optical disk}
\twemoji{orange book}
\twemoji{orange circle}
\twemoji{orange heart}
\twemoji{orange square}
\twemoji{orthodox cross}
\twemoji{outbox tray}
\twemoji{P button}
\twemoji{package}
\twemoji{page facing up}
\twemoji{page with curl}
\twemoji{pager}
\twemoji{paintbrush}
\twemoji{palm tree}
\twemoji{palms up together}*
\twemoji{paperclip}
\twemoji{parachute}
\twemoji{part alternation mark}
\twemoji{party popper}
\twemoji{partying face}
\twemoji{pause button}
\twemoji{peace symbol}
\twemoji{pen}
\twemoji{pencil}
\twemoji{pensive face}
\twemoji{people holding hands}*
\twemoji{people hugging}
\twemoji{people with bunny ears}
\twemoji{people wrestling}
\twemoji{performing arts}
\twemoji{persevering face}
\twemoji{person}*
\twemoji{person bouncing ball}*
\twemoji{person bowing}*
\twemoji{person cartwheeling}*
\twemoji{person climbing}*
\twemoji{person facepalming}*
\twemoji{person feeding baby}*
\twemoji{person fencing}
\twemoji{person frowning}*
\twemoji{person gesturing NO}*
\twemoji{person gesturing OK}*
\twemoji{person getting haircut}*
\twemoji{person getting massage}*
\twemoji{person golfing}*

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\twemoji{carpentry saw}
\twemoji{castle}
\twemoji{cat with tears of joy}
\twemoji{cat with wry smile}
\twemoji{chains}
\twemoji{chair}
\twemoji{chart decreasing}
\twemoji{chart increasing}
\twemoji{chart increasing with yen}
\twemoji{check box with check}
\twemoji{check mark}
\twemoji{check mark button}
\twemoji{chequered flag}
\twemoji{cherry blossom}
\twemoji{chess pawn}
\twemoji{chestnut}
\twemoji{child}*
\twemoji{children crossing}
\twemoji{Christmas tree}
\twemoji{church}
\twemoji{cigarette}
\twemoji{cinema}
\twemoji{circled M}
\twemoji{circus tent}
\twemoji{cityscape}
\twemoji{cityscape at dusk}
\twemoji{CL button}
\twemoji{clamp}
\twemoji{clapper board}
\twemoji{clapping hands}*
\twemoji{classical building}
\twemoji{clipboard}
\twemoji{clockwise vertical arrows}
\twemoji{closed book}
\twemoji{closed mailbox with lowered flag}
\twemoji{closed mailbox with raised flag}
\twemoji{closed umbrella}
\twemoji{clown face}
\twemoji{clutch bag}
\twemoji{coat}
\twemoji{coffin}
\twemoji{coin}
\twemoji{person in bed}*
\twemoji{person in lotus position}*
\twemoji{person in manual wheelchair}*
\twemoji{person in motorized wheelchair}*
\twemoji{person in steamy room}*
\twemoji{person in suit levitating}*
\twemoji{person in tuxedo}*
\twemoji{person juggling}*
\twemoji{person kneeling}*
\twemoji{person lifting weights}*
\twemoji{person playing handball}*
\twemoji{person playing water polo}*
\twemoji{person pouting}*
\twemoji{person raising hand}*
\twemoji{person running}*
\twemoji{person shrugging}*
\twemoji{person standing}*
\twemoji{person surfing}*
\twemoji{person swimming}*
\twemoji{person taking bath}*
\twemoji{person tipping hand}*
\twemoji{person walking}*
\twemoji{person wearing turban}*
\twemoji{person with skullcap}*
\twemoji{person with veil}*
\twemoji{person with white cane}*
\twemoji{petri dish}
\twemoji{pick}
\twemoji{pile of poo}
\twemoji{pill}
\twemoji{pilot}*
\twemoji{pinched fingers}*
\twemoji{pinching hand}*
\twemoji{pine decoration}
\twemoji{ping pong}
\twemoji{Pisces}
\twemoji{piñata}
\twemoji{placard}
\twemoji{place of worship}
\twemoji{play button}
\twemoji{play or pause button}
\twemoji{pleading face}

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\twemoji{cold face}
\twemoji{collision}
\twemoji{comet}
\twemoji{compass}
\twemoji{computer}
\twemoji{computer disk}
\twemoji{computer mouse}
\twemoji{confetti ball}
\twemoji{confounded face}
\twemoji{confused face}
\twemoji{construction worker}*
\twemoji{control knobs}
\twemoji{convenience store}
\twemoji{cook}*
\twemoji{COOL button}
\twemoji{copyright}
\twemoji{couch and lamp}
\twemoji{counterclockwise arrows button}
\twemoji{couple with heart}*
\twemoji{couplekiss}
\twemoji{cowboy hat face}
\twemoji{crayon}
\twemoji{credit card}
\twemoji{cricket game}
\twemoji{cross mark}
\twemoji{cross mark button}
\twemoji{crossed fingers}*
\twemoji{crossed flags}
\twemoji{crossed swords}
\twemoji{crown}
\twemoji{crying cat}
\twemoji{crying face}
\twemoji{crystal ball}
\twemoji{curling stone}
\twemoji{curly hair}
\twemoji{curly loop}
\twemoji{currency exchange}
\twemoji{cyclone}
\twemoji{dagger}
\twemoji{dark skin tone}
\twemoji{dashing away}
\twemoji{date}
\twemoji{deaf man}*
\twemoji{deaf person}*
\twemoji{deaf woman}*
\twemoji{plunger}
\twemoji{plus}
\twemoji{police officer}*
\twemoji{pool 8 ball}
\twemoji{post office}
\twemoji{postal horn}
\twemoji{postbox}
\twemoji{potable water}
\twemoji{potted plant}
\twemoji{pound banknote}
\twemoji{pouting cat}
\twemoji{pouting face}
\twemoji{prayer beads}
\twemoji{pregnant woman}*
\twemoji{prince}*
\twemoji{princess}*
\twemoji{printer}
\twemoji{prohibited}
\twemoji{purple circle}
\twemoji{purple heart}
\twemoji{purple square}
\twemoji{purse}
\twemoji{pushpin}
\twemoji{puzzle piece}
\twemoji{radio}
\twemoji{radio button}
\twemoji{radioactive}
\twemoji{rainbow}
\twemoji{raised back of hand}*
\twemoji{raised fist}*
\twemoji{raised hand}*
\twemoji{raising hands}*
\twemoji{razor}
\twemoji{receipt}
\twemoji{record button}
\twemoji{recycling symbol}
\twemoji{red circle}
\twemoji{red envelope}
\twemoji{red exclamation mark}
\twemoji{red hair}
\twemoji{red heart}
\twemoji{red paper lantern}
\twemoji{red question mark}
\twemoji{red square}
\twemoji{red triangle pointed down}

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\twemoji{deciduous tree}
\twemoji{department store}
\twemoji{derelict house}
\twemoji{desert}
\twemoji{desert island}
\twemoji{desktop computer}
\twemoji{detective}*
\twemoji{diamond with a dot}
\twemoji{dim button}
\twemoji{disappointed face}
\twemoji{disguised face}
\twemoji{divide}
\twemoji{diving mask}
\twemoji{diya lamp}
\twemoji{dizzy}
\twemoji{dna}
\twemoji{dollar banknote}
\twemoji{door}
\twemoji{dotted six-pointed star}
\twemoji{double curly loop}
\twemoji{double exclamation mark}
\twemoji{dove}
\twemoji{down arrow}
\twemoji{down-left arrow}
\twemoji{down-right arrow}
\twemoji{downcast face with sweat}
\twemoji{downwards button}
\twemoji{dress}
\twemoji{drooling face}
\twemoji{drop of blood}
\twemoji{droplet}
\twemoji{drum}
\twemoji{dvd}
\twemoji{e-mail}
\twemoji{e50a}
\twemoji{ear}*
\twemoji{ear of corn}
\twemoji{ear with hearing aid}*
\twemoji{eight-pointed star}
\twemoji{eight-spoked asterisk}
\twemoji{eject button}
\twemoji{electric plug}
\twemoji{elevator}
\twemoji{elf}*
\twemoji{END arrow}
\twemoji{red triangle pointed up}
\twemoji{registered}
\twemoji{relieved face}
\twemoji{reminder ribbon}
\twemoji{repeat button}
\twemoji{repeat single button}
\twemoji{rescue worker's helmet}
\twemoji{restroom}
\twemoji{reverse button}
\twemoji{revolving hearts}
\twemoji{ribbon}
\twemoji{right anger bubble}
\twemoji{right arrow}
\twemoji{right arrow curving down}
\twemoji{right arrow curving left}
\twemoji{right arrow curving up}
\twemoji{right-facing fist}*
\twemoji{ring}
\twemoji{ringed planet}
\twemoji{robot}
\twemoji{rock}
\twemoji{roll of paper}
\twemoji{rolled-up newspaper}
\twemoji{roller coaster}
\twemoji{rolling on the floor laughing}
\twemoji{rose}
\twemoji{rosette}
\twemoji{round pushpin}
\twemoji{rugby football}
\twemoji{running shirt}
\twemoji{running shoe}
\twemoji{sad but relieved face}
\twemoji{safety pin}
\twemoji{safety vest}
\twemoji{Sagittarius}
\twemoji{sailboat}
\twemoji{Santa Claus}*
\twemoji{sari}
\twemoji{satellite antenna}
\twemoji{saxophone}
\twemoji{scarf}
\twemoji{school}
\twemoji{scientist}*
\twemoji{scissors}
\twemoji{scorpius}

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\twemoji{envelope}
\twemoji{envelope with arrow}
\twemoji{euro banknote}
\twemoji{evergreen tree}
\twemoji{exclamation question mark}
\twemoji{exploding head}
\twemoji{expressionless face}
\twemoji{eye}
\twemoji{eye in speech bubble}
\twemoji{eyeglasses}
\twemoji{eyes}
\twemoji{face blowing a kiss}
\twemoji{face savoring food}
\twemoji{face screaming in fear}
\twemoji{face vomiting}
\twemoji{face with hand over mouth}
\twemoji{face with head-bandage}
\twemoji{face with medical mask}
\twemoji{face with monocle}
\twemoji{face with open mouth}
\twemoji{face with raised eyebrow}
\twemoji{face with rolling eyes}
\twemoji{face with steam from nose}
\twemoji{face with symbols on mouth}
\twemoji{face with tears of joy}
\twemoji{face with thermometer}
\twemoji{face with tongue}
\twemoji{face without mouth}
\twemoji{factory}
\twemoji{factory worker}*
\twemoji{fairy}*
\twemoji{fallen leaf}
\twemoji{family}*
\twemoji{farmer}*
\twemoji{fast down button}
\twemoji{fast reverse button}
\twemoji{fast up button}
\twemoji{fast-forward button}
\twemoji{fax machine}
\twemoji{fearful face}
\twemoji{feather}
\twemoji{screwdriver}
\twemoji{scroll}
\twemoji{seat}
\twemoji{see-no-evil monkey}
\twemoji{seedling}
\twemoji{selfie}*
\twemoji{sewing needle}
\twemoji{shamrock}
\twemoji{sheaf of rice}
\twemoji{shield}
\twemoji{shinto shrine}
\twemoji{shooting star}
\twemoji{shopping bags}
\twemoji{shopping cart}
\twemoji{shorts}
\twemoji{shower}
\twemoji{shuffle tracks button}
\twemoji{shushing face}
\twemoji{sign of the horns}*
\twemoji{singer}*
\twemoji{skier}
\twemoji{skis}
\twemoji{skull}
\twemoji{skull and crossbones}
\twemoji{sleeping face}
\twemoji{sleepy face}
\twemoji{slightly frowning face}
\twemoji{slightly smiling face}
\twemoji{slot machine}
\twemoji{small blue diamond}
\twemoji{small orange diamond}
\twemoji{smiling cat with heart-eyes}
\twemoji{smiling face}
\twemoji{smiling face with halo}
\twemoji{smiling face with heart-eyes}
\twemoji{smiling face with hearts}
\twemoji{smiling face with horns}
\twemoji{smiling face with smiling eyes}
\twemoji{smiling face with sunglasses}
\twemoji{smiling face with tear}
\twemoji{smirking face}

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\twemoji{female sign}
\twemoji{ferris wheel}
\twemoji{ferry}
\twemoji{field hockey}
\twemoji{file cabinet}
\twemoji{file folder}
\twemoji{film frames}
\twemoji{film projector}
\twemoji{fire}
\twemoji{fire extinguisher}
\twemoji{firecracker}
\twemoji{firefighter}*
\twemoji{fireworks}
\twemoji{fishing pole}
\twemoji{flag in hole}
\twemoji{flashlight}
\twemoji{flat shoe}
\twemoji{fleur-de-lis}
\twemoji{flexed biceps}*
\twemoji{floppy disk}
\twemoji{flower playing cards}
\twemoji{flushed face}
\twemoji{flying disc}
\twemoji{foggy}
\twemoji{folded hands}*
\twemoji{foot}*
\twemoji{footprints}
\twemoji{fountain}
\twemoji{fountain pen}
\twemoji{four leaf clover}
\twemoji{framed picture}
\twemoji{FREE button}
\twemoji{frowning face}
\twemoji{frowning face with open mouth}
\twemoji{fuel pump}
\twemoji{funeral urn}
\twemoji{game die}
\twemoji{gear}
\twemoji{gem stone}
\twemoji{Gemini}
\twemoji{genie}
\twemoji{ghost}
\twemoji{girl}*
\twemoji{globe showing Americas}
\twemoji{sneezing face}
\twemoji{snow-capped mountain}
\twemoji{snowboarder}*
\twemoji{snowflake}
\twemoji{snowman}
\twemoji{snowman without snow}
\twemoji{soap}
\twemoji{soccer ball}
\twemoji{socks}
\twemoji{softball}
\twemoji{SOON arrow}
\twemoji{SOS button}
\twemoji{sparkle}
\twemoji{sparkler}
\twemoji{sparkles}
\twemoji{sparkling heart}
\twemoji{speak-no-evil monkey}
\twemoji{speaker high volume}
\twemoji{speaker low volume}
\twemoji{speaker medium volume}
\twemoji{speaking head}
\twemoji{speech balloon}
\twemoji{spider}
\twemoji{spider web}
\twemoji{spiral calendar}
\twemoji{spiral notepad}
\twemoji{sponge}
\twemoji{spoon}
\twemoji{sports medal}
\twemoji{squinting face with tongue}
\twemoji{stadium}
\twemoji{star}
\twemoji{star and crescent}
\twemoji{star of David}
\twemoji{star-struck}
\twemoji{Statue of Liberty}
\twemoji{stethoscope}
\twemoji{stop button}
\twemoji{stop sign}
\twemoji{straight ruler}
\twemoji{student}*
\twemoji{studio microphone}
\twemoji{sun with face}
\twemoji{sunflower}

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\twemoji{globe showing Asia-Australia}
\twemoji{globe showing Europe-Africa}
\twemoji{globe with meridians}
\twemoji{gloves}
\twemoji{glowing star}
\twemoji{goal net}
\twemoji{goblin}
\twemoji{goggles}
\twemoji{graduation cap}
\twemoji{green book}
\twemoji{green circle}
\twemoji{green heart}
\twemoji{green square}
\twemoji{grimacing face}
\twemoji{grinning cat}
\twemoji{grinning cat with smiling eyes}
\twemoji{grinning face}
\twemoji{grinning face with big eyes}
\twemoji{grinning face with smiling eyes}
\twemoji{grinning face with sweat}
\twemoji{grinning squinting face}
\twemoji{growing heart}
\twemoji{guard}*
\twemoji{guitar}
\twemoji{hammer}
\twemoji{hammer and pick}
\twemoji{hammer and wrench}
\twemoji{hand with fingers splayed}*
\twemoji{handbag}
\twemoji{handshake}
\twemoji{headphones}
\twemoji{headstone}
\twemoji{health worker}*
\twemoji{hear-no-evil monkey}
\twemoji{heart decoration}
\twemoji{heart exclamation}
\twemoji{heart with arrow}
\twemoji{heart with ribbon}
\twemoji{heavy dollar sign}
\twemoji{herb}
\twemoji{hibiscus}
\twemoji{sunrise}
\twemoji{sunrise over mountains}
\twemoji{sunset}
\twemoji{superhero}*
\twemoji{supervillain}*
\twemoji{sweat droplets}
\twemoji{synagogue}
\twemoji{syringe}
\twemoji{t-shirt}
\twemoji{tanabata tree}
\twemoji{Taurus}
\twemoji{teacher}*
\twemoji{tear-off calendar}
\twemoji{technologist}*
\twemoji{teddy bear}
\twemoji{telephone}
\twemoji{telephone receiver}
\twemoji{telescope}
\twemoji{television}
\twemoji{tennis}
\twemoji{tent}
\twemoji{test tube}
\twemoji{thinking face}
\twemoji{thong sandal}
\twemoji{thought balloon}
\twemoji{thread}
\twemoji{thumbs down}*
\twemoji{thumbs up}*
\twemoji{ticket}
\twemoji{tired face}
\twemoji{toilet}
\twemoji{Tokyo tower}
\twemoji{tongue}
\twemoji{toolbox}
\twemoji{tooth}
\twemoji{toothbrush}
\twemoji{TOP arrow}
\twemoji{top hat}
\twemoji{trackball}
\twemoji{trade mark}
\twemoji{transgender symbol}

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\twemoji{high voltage}
\twemoji{high-heeled shoe}
\twemoji{hiking boot}
\twemoji{hindu temple}
\twemoji{hole}
\twemoji{hollow red circle}
\twemoji{hook}
\twemoji{horse racing}*
\twemoji{hospital}
\twemoji{hot face}
\twemoji{hot springs}
\twemoji{hotel}
\twemoji{house}
\twemoji{house with garden}
\twemoji{houses}
\twemoji{hugging face}
\twemoji{hundred points}
\twemoji{hushed face}
\twemoji{hut}
\twemoji{ice hockey}
\twemoji{ice skate}
\twemoji{ID button}
\twemoji{inbox tray}
\twemoji{incoming envelope}
\twemoji{index pointing up}*
\twemoji{infinity}
\twemoji{information}
\twemoji{input latin letters}
\twemoji{input latin lowercase}
\twemoji{input latin uppercase}
\twemoji{input numbers}
\twemoji{input symbols}
\twemoji{jack-o-lantern}
\twemoji{Japanese ‘‘acceptable’’ button}
\twemoji{Japanese ‘‘application’’ button}
\twemoji{Japanese ‘‘bargain’’ button}
\twemoji{Japanese ‘‘congratulations’’ button}
\twemoji{Japanese ‘‘discount’’ button}
\twemoji{Japanese ‘‘free of charge’’ button}
\twemoji{Japanese ‘‘here’’ button}
\twemoji{triangular flag}
\twemoji{triangular ruler}
\twemoji{trident emblem}
\twemoji{trophy}
\twemoji{trumpet}
\twemoji{tulip}
\twemoji{two hearts}
\twemoji{umbrella}
\twemoji{umbrella on ground}
\twemoji{umbrella with rain drops}
\twemoji{unamused face}
\twemoji{unlocked}
\twemoji{up arrow}
\twemoji{UP! button}
\twemoji{up-down arrow}
\twemoji{up-left arrow}
\twemoji{up-right arrow}
\twemoji{upside-down face}
\twemoji{upwards button}
\twemoji{vampire}*
\twemoji{vibration mode}
\twemoji{victory hand}*
\twemoji{video camera}
\twemoji{video game}
\twemoji{videocassette}
\twemoji{violin}
\twemoji{Virgo}
\twemoji{volcano}
\twemoji{volleyball}
\twemoji{VS button}
\twemoji{vulcan salute}*
\twemoji{warning}
\twemoji{wastebasket}
\twemoji{watch}
\twemoji{water closet}
\twemoji{water pistol}
\twemoji{water wave}
\twemoji{waving hand}*
\twemoji{wavy dash}
\twemoji{weary cat}

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- \twemoji{Japanese ‘‘monthly amount’’ button}
- \twemoji{Japanese ‘‘no vacancy’’ button}
- \twemoji{Japanese ‘‘not free of charge’’ button}
- \twemoji{Japanese ‘‘open for business’’ button}
- \twemoji{Japanese ‘‘passing grade’’ button}
- \twemoji{Japanese ‘‘prohibited’’ button}
- \twemoji{Japanese ‘‘reserved’’ button}
- \twemoji{Japanese ‘‘secret’’ button}
- \twemoji{Japanese ‘‘service charge’’ button}
- \twemoji{Japanese ‘‘vacancy’’ button}
- \twemoji{Japanese castle}
- \twemoji{Japanese dolls}
- \twemoji{Japanese post office}
- \twemoji{Japanese symbol for beginner}
- \twemoji{jeans}
- \twemoji{joker}
- \twemoji{joystick}
- \twemoji{judge}*
- \twemoji{kaaba}
- \twemoji{key}
- \twemoji{keyboard}
- \twemoji{keycap: 0}
- \twemoji{keycap: 1}
- \twemoji{keycap: 2}
- \twemoji{keycap: 3}
- \twemoji{keycap: 4}
- \twemoji{keycap: 5}
- \twemoji{keycap: 6}
- \twemoji{keycap: 7}
- \twemoji{keycap: 8}
- \twemoji{keycap: 9}
- \twemoji{keycap: 10}
- \twemoji{keycap: *}
- \twemoji{keycap: #}
- \twemoji{weary face}
- \twemoji{wedding}
- \twemoji{wheel of dharma}
- \twemoji{wheelchair symbol}
- \twemoji{white cane}
- \twemoji{white circle}
- \twemoji{white exclamation mark}
- \twemoji{white flag}
- \twemoji{white flower}
- \twemoji{white hair}
- \twemoji{white heart}
- \twemoji{white large square}
- \twemoji{white medium square}
- \twemoji{white medium-small square}
- \twemoji{white question mark}
- \twemoji{white small square}
- \twemoji{white square button}
- \twemoji{wilted flower}
- \twemoji{wind chime}
- \twemoji{window}
- \twemoji{winking face}
- \twemoji{winking face with tongue}
- \twemoji{woman}*
- \twemoji{woman and man holding hands}*
- \twemoji{woman artist}*
- \twemoji{woman astronaut}*
- \twemoji{woman bouncing ball}*
- \twemoji{woman bowing}*
- \twemoji{woman cartwheeling}*
- \twemoji{woman climbing}*
- \twemoji{woman construction worker}*
- \twemoji{woman cook}*
- \twemoji{woman dancing}*
- \twemoji{woman detective}*

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\twemoji{kimono}
\twemoji{kiss}*
\twemoji{kissing cat}
\twemoji{kissing face}
\twemoji{kissing face with closed eyes}
\twemoji{kissing face with smiling eyes}
\twemoji{kitchen knife}
\twemoji{kite}
\twemoji{knocked-out face}
\twemoji{knot}
\twemoji{lab coat}
\twemoji{label}
\twemoji{lacrosse}
\twemoji{ladder}
\twemoji{large blue diamond}
\twemoji{large orange diamond}
\twemoji{last track button}
\twemoji{latin cross}
\twemoji{leaf fluttering in wind}
\twemoji{ledger}
\twemoji{left arrow}
\twemoji{left arrow curving right}
\twemoji{left speech bubble}
\twemoji{left-facing fist}*
\twemoji{left-right arrow}
\twemoji{leg}*
\twemoji{Leo}
\twemoji{level slider}
\twemoji{Libra}
\twemoji{light bulb}
\twemoji{light skin tone}
\twemoji{link}
\twemoji{linked paperclips}
\twemoji{lipstick}
\twemoji{litter in bin sign}
\twemoji{locked}
\twemoji{locked with key}
\twemoji{locked with pen}
\twemoji{long drum}
\twemoji{lotion bottle}
\twemoji{loudly crying face}
\twemoji{loudspeaker}

\twemoji{woman elf}*
\twemoji{woman facepalming}*
\twemoji{woman factory worker}*
\twemoji{woman fairy}*
\twemoji{woman farmer}*
\twemoji{woman feeding baby}*
\twemoji{woman firefighter}*
\twemoji{woman frowning}*
\twemoji{woman genie}
\twemoji{woman gesturing NO}*
\twemoji{woman gesturing OK}*
\twemoji{woman getting haircut}*
\twemoji{woman getting massage}*
\twemoji{woman golfing}*
\twemoji{woman guard}*
\twemoji{woman health worker}*
\twemoji{woman in lotus position}*
\twemoji{woman in manual wheelchair}*
\twemoji{woman in motorized wheelchair}*
\twemoji{woman in steamy room}*
\twemoji{woman in tuxedo}*
\twemoji{woman judge}*
\twemoji{woman juggling}*
\twemoji{woman kneeling}*
\twemoji{woman lifting weights}*
\twemoji{woman mage}*
\twemoji{woman mechanic}*
\twemoji{woman office worker}*
\twemoji{woman pilot}*
\twemoji{woman playing handball}*
\twemoji{woman playing water polo}*
\twemoji{woman police officer}*
\twemoji{woman pouting}*
\twemoji{woman raising hand}*
\twemoji{woman running}*
\twemoji{woman scientist}*
\twemoji{woman shrugging}*
\twemoji{woman singer}*
\twemoji{woman standing}*
\twemoji{woman student}*
\twemoji{woman superhero}*
\twemoji{woman supervillain}*

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\twemoji{love hotel}
\twemoji{love letter}
\twemoji{love-you gesture}*
\twemoji{luggage}
\twemoji{lungs}
\twemoji{lying face}
\twemoji{mage}*
\twemoji{magic wand}
\twemoji{magnet}
\twemoji{magnifying glass tilted left}
\twemoji{magnifying glass tilted right}
\twemoji{mahjong red dragon}
\twemoji{male sign}
\twemoji{man}*
\twemoji{man artist}*
\twemoji{man astronaut}*
\twemoji{man bouncing ball}*
\twemoji{man bowing}*
\twemoji{man cartwheeling}*
\twemoji{man climbing}*
\twemoji{man construction worker}*
\twemoji{man cook}*
\twemoji{man dancing}*
\twemoji{man detective}*
\twemoji{man elf}*
\twemoji{man facepalming}*
\twemoji{man factory worker}*
\twemoji{man fairy}*
\twemoji{man farmer}*
\twemoji{man feeding baby}*
\twemoji{man firefighter}*
\twemoji{man frowning}*
\twemoji{man genie}
\twemoji{man gesturing NO}*
\twemoji{man gesturing OK}*
\twemoji{man getting haircut}*
\twemoji{man getting massage}*
\twemoji{man golfing}*
\twemoji{man guard}*
\twemoji{man health worker}*
\twemoji{woman surfing}*
\twemoji{woman swimming}*
\twemoji{woman teacher}*
\twemoji{woman technologist}*
\twemoji{woman tipping hand}*
\twemoji{woman vampire}*
\twemoji{woman walking}*
\twemoji{woman wearing turban}*
\twemoji{woman with headscarf}*
\twemoji{woman with veil}*
\twemoji{woman with white cane}*
\twemoji{woman zombie}
\twemoji{woman's boot}
\twemoji{woman's clothes}
\twemoji{woman's hat}
\twemoji{woman's sandal}
\twemoji{women holding hands}*
\twemoji{women with bunny ears}
\twemoji{women wrestling}
\twemoji{women's room}
\twemoji{wood}
\twemoji{woozy face}
\twemoji{world map}
\twemoji{worried face}
\twemoji{wrapped gift}
\twemoji{wrench}
\twemoji{writing hand}*
\twemoji{yarn}
\twemoji{yawning face}
\twemoji{yellow circle}
\twemoji{yellow heart}
\twemoji{yellow square}
\twemoji{yen banknote}
\twemoji{yin yang}
\twemoji{yo-yo}
\twemoji{zany face}
\twemoji{zipper-mouth face}
\twemoji{zombie}
\twemoji{zzz}

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

* Variants of this symbol portraying different colors and styles are not shown. For example, twemojis defines the following variants of "`thumbs up`":

`thumbs up` | `thumbs up: dark skin tone` | `thumbs up: medium-dark skin tone` | `thumbs up: medium skin tone` | `thumbs up: medium-light skin tone` | `thumbs up: light skin tone`

See the twemojis documentation for more information.

Table 633: fontawesome5 Faces

\faAngry	\faGrinWink
\faAngry[regular]	\faGrinWink[regular]
\faDizzy	\faKiss
\faDizzy[regular]	\faKiss[regular]
\faFlushed	\faKissBeam
\faFlushed[regular]	\faKissBeam[regular]
\faFrown	\faKissWinkHeart
\faFrown[regular]	\faKissWinkHeart[regular]
\faFrownOpen	\faLaugh
\faFrownOpen[regular]	\faLaugh[regular]
\faGrimace	\faLaughBeam
\faGrimace[regular]	\faLaughBeam[regular]
\faGrin*[regular]	\faLaughSquint
\faGrin*	\faLaughSquint[regular]
\faGrin	\faLaughWink
\faGrin[regular]	\faLaughWink[regular]
\faGrinBeam	\faMeh
\faGrinBeam[regular]	\faMeh[regular]
\faGrinBeamSweat	\faMehBlank
\faGrinBeamSweat[regular]	\faMehBlank[regular]

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\faGrinHearts		\faMehRollingEyes	
\faGrinHearts[regular]		\faMehRollingEyes[regular]	
\faGrinSquint		\faSadCry	
\faGrinSquint[regular]		\faSadCry[regular]	
\faGrinSquintTears		\faSadTear	
\faGrinSquintTears[regular]		\faSadTear[regular]	
\faGrinStars		\faSmile	
\faGrinStars[regular]		\faSmile[regular]	
\faGrinTears		\faSmileBeam	
\faGrinTears[regular]		\faSmileBeam[regular]	
\faGrinTongue		\faSmileWink	
\faGrinTongue[regular]		\faSmileWink[regular]	
\faGrinTongueSquint		\faSurprise	
\faGrinTongueSquint[regular]		\faSurprise[regular]	
\faGrinTongueWink		\faTired	
\faGrinTongueWink[regular]		\faTired[regular]	

Table 634: simpsons Characters from *The Simpsons*

\Bart

\Homer

\Maggie

\SNPP

\Burns

\Lisa

\Marge

The location of the characters' pupils can be controlled with the `\Goofy` command. See *A METAFONT of 'Simpsons' characters* [Che98] for more information. Also, each of the above can be prefixed with `\Left` to make the character face left instead of right:

`\Left\Bart`

Table 635: asapsym People

	\asapCycling		\asapMaleAtDrinkingFountain
	\asapFemaleAdult		\asapMaleAtHelpDesk
	\asapFemaleAtDrinkingFountain		\asapMaleChild
	\asapFemaleAtHelpDesk		\asapMaleDiscardingTrash
	\asapFemaleChild		\asapMaleHoldingInfant
	\asapFemaleDiscardingTrash		\asapMaleWalking
	\asapFemaleHoldingInfant		\asapMaleWalkingDog
	\asapFemaleWalking		\asapMaleWalkingStroller
	\asapFemaleWalkingDog		\asapMaleWithChild
	\asapFemaleWalkingStroller		\asapMaleWithLuggageWaiting
	\asapFemaleWithChild		\asapMaleWithLuggageWaving
	\asapFemaleWithLuggageWaiting		\asapMaleWithServiceAnimal
	\asapFemaleWithLuggageWaving		\asapPregnant
	\asapFemaleWithServiceAnimal		\asapWaitingSeated
	\asapGroupMeeting		\asapWalkingCane
	\asapInfant		\asapWheelchairStationary
	\asapMaleAdult		

asapsym requires either LuaLaTeX or XeLaTeX.

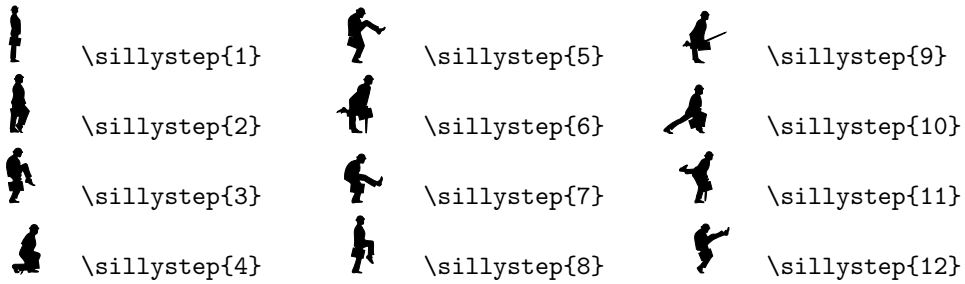
Table 636: utfsym People and Faces

	\usym{1F464}		\usym{1F46C}		\usym{1F474}		\usym{1F47E}
	\usym{1F465}		\usym{1F46D}		\usym{1F475}		\usym{1F47F}
	\usym{1F466}		\usym{1F46E}		\usym{1F476}		\usym{1F480}
	\usym{1F467}		\usym{1F46F}		\usym{1F477}		\usym{1F481}
	\usym{1F468}		\usym{1F470}		\usym{1F478}		\usym{1F482}
	\usym{1F469}		\usym{1F471}		\usym{1F479}		\usym{1F483}
	\usym{1F46A}		\usym{1F472}		\usym{1F47A}		\usym{1F486}
	\usym{1F46B}		\usym{1F473}		\usym{1F47D}		\usym{1F487}

All utfsym symbols are implemented with TikZ graphics, not with a font. In addition to \usym, the utfsym package defines \usymH, which renders a symbol at a given height, and \usymW, which renders a symbol at a given width. For example, "\usymH{1F475}{36pt}" produces

See the utfsym documentation for more information.

Table 637: sillypage Silly Walks



All sillypage symbols are implemented with PDF graphics, not with a font.

Table 638: typicons Users

	\tiUser		\tiUserAddOutline		\tiUserDeleteOutline
	\tiUserAdd		\tiUserDelete		\tiUserOutline

typicons requires either LuaLaTeX or XeLaTeX.

Table 639: fontawesome5 Users

	\faUser*		\faUserEdit		\faUsers
	\faUser		\faUserFriends		\faUsersCog
	\faUser[regular]		\faUserGraduate		\faUserSecret
	\faUserAltSlash		\faUserInjured		\faUserShield
	\faUserAstronaut		\faUserLock		\faUserSlash
	\faUserCheck		\faUserMd		\faUsersSlash
	\faUserCircle		\faUserMinus		\faUserTag
	\faUserCircle[regular]		\faUserNinja		\faUserTie
	\faUserClock		\faUserNurse		\faUserTimes
	\faUserCog		\faUserPlus		

Table 640: scsnowman Snowmen

☃ \scsnowman

* \scsnowman is drawn using Ti*k*Z. The command accepts a number of options for controlling the presence, appearance, and color of the snowman's body, eyes, nose, mouth, arms, hat, and more. See the scsnowman documentation for more information, but the following examples showcase a subset of the possibilities (drawn large for clarity):

\scsnowman

```
\scsnowman[eyes, mouth,
nose, arms, hat, muffler,
buttons, snow, broom]
```

Table 641: typicons Files and Folders

\tiDocument	\tiDocumentText	\tiFolderDelete
\tiDocumentAdd	\tiFolder	\tiFolderOpen
\tiDocumentDelete	\tiFolderAdd	

typicons requires either LuaLaTeX or XeLaTeX.

Table 642: fontawesome5 Files and Folders

\faFile*[regular]	\faFileExcel[regular]	\faFileSignature
\faFile*	\faFileExport	\faFileUpload
\faFile	\faFileImage	\faFileVideo
\faFile[regular]	\faFileImage[regular]	\faFileVideo[regular]
\faFileArchive	\faFileImport	\faFileWord
\faFileArchive[regular]	\faFileInvoice	\faFileWord[regular]
\faFileAudio	\faFileInvoiceDollar	\faFolder
\faFileAudio[regular]	\faFileMedical*	\faFolder[regular]
\faFileCode	\faFileMedical	\faFolderMinus
\faFileCode[regular]	\faFilePdf	\faFolderOpen
\faFileContract	\faFilePdf[regular]	\faFolderOpen[regular]
\faFileCsv	\faFilePowerpoint	\faFolderPlus
\faFileDownload	\faFilePowerpoint[regular]	
\faFileExcel	\faFilePrescription	

Table 643: fontawesome5 Religion

	\faAnkh		\faKaaba		\faQuran
	\faBahai		\faKhanda		\faStarAndCrescent
	\faBible		\faMenorah		\faStarOfDavid
	\faChurch		\faMosque		\faSynagogue
	\faCross		\faOm		\faTorah
	\faDharmachakra		\faPastafarianism		\faToriiGate
	\faGopuram		\faPlaceOfWorship		\faVihara
	\faHamsa		\faPray		\faYinYang
	\faHanukiah		\faPrayingHands		

Table 644: utfsym Religion

	\usym{1F543}		\usym{1F545}		\usym{1F54B}		\usym{1F54D}
	\usym{1F544}		\usym{1F549}		\usym{1F54C}		\usym{1F54E}

All utfsym symbols are implemented with Ti*k*Z graphics, not with a font. In addition to \usym, the utfsym package defines \usymH, which renders a symbol at a given height, and \usymW, which renders a symbol at a given width. For example, "\usymH{1f54b}{36pt}" produces

See the utfsym documentation for more information.

Table 645: asapsym Elevators, Escalators, and Stairs

	\asapElevator		\asapEscalatorUp		\asapStairUp
	\asapEscalator		\asapStair		
	\asapEscalatorDown		\asapStairDown		

asapsym requires either LuaLaTeX or XeLaTeX.

Table 646: Miscellaneous bclogo Symbols

	\bcattention		\bcetoile		\bcpanchant
	\bcbombe		\bcfemme		\bcpeaceandlove
	\bcbook		\bcfeujaune		\bcpluie
	\bccalendrier		\bcfeurouge		\bcplume
	\bccle		\bcfeutricolore		\bcpoisson
	\bcclefa		\bcfeuvert		\bcquestion
	\bcclesol		\bcfleur		\bcrecyclage
	\bccoeur		\bchomme		\bcrosevents
	\bccrayon		\bchorloge		\bcsmbh
	\bccube		\bcicosaedre		\bcsmmh
	\bcdallemagne		\bcinfo		\bcsoleil
	\bcdanger		\bcinterdit		\bcspadesuit
	\bcdautriche		\bclampe		\bcstop
	\bcdbelgique		\bcloupe		\bctakecare
	\bcdbulgarie		\bcneige		\bctetraedre
	\bcdfrance		\bcnote		\bctrefle
	\bcditalie		\bcnucleaire		\bctrombone
	\bcdluxembourg		\bcoctaedre		\bcvaletcoeur
	\bcdodecaedre		\bcoeil		\bcvelo
	\bcdpaysbas		\bcorne		\bcyin
	\bcdz		\bcours		

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`\bceclaircie` `\bcoutil`

All bclogo symbols are implemented with Ti*k*Z (or alternatively, PSTricks) graphics, not with a font. This is how the symbols shown above can include color.

Table 647: Miscellaneous utfsym Symbols

	\usym{1F300}		\usym{1F3EF}		\usym{1F4E3}		\usym{1F583}
	\usym{1F301}		\usym{1F3F0}		\usym{1F4E4}		\usym{1F584}
	\usym{1F302}		\usym{1F3F1}		\usym{1F4E5}		\usym{1F585}
	\usym{1F303}		\usym{1F3F2}		\usym{1F4E6}		\usym{1F586}
	\usym{1F304}		\usym{1F3F3}		\usym{1F4E7}		\usym{1F587}
	\usym{1F305}		\usym{1F3F4}		\usym{1F4E8}		\usym{1F588}
	\usym{1F306}		\usym{1F3F7}		\usym{1F4E9}		\usym{1F5A5}
	\usym{1F307}		\usym{1F3FA}		\usym{1F4EA}		\usym{1F5A6}
	\usym{1F308}		\usym{1F3FB}		\usym{1F4EB}		\usym{1F5A7}
	\usym{1F309}		\usym{1F3FC}		\usym{1F4EC}		\usym{1F5A8}
	\usym{1F30A}		\usym{1F3FD}		\usym{1F4ED}		\usym{1F5A9}
	\usym{1F30B}		\usym{1F3FE}		\usym{1F4EE}		\usym{1F5AA}
	\usym{1F30C}		\usym{1F3FF}		\usym{1F4EF}		\usym{1F5AB}
	\usym{1F30D}		\usym{1F43D}		\usym{1F4F0}		\usym{1F5AC}
	\usym{1F30E}		\usym{1F43E}		\usym{1F4F1}		\usym{1F5AD}
	\usym{1F30F}		\usym{1F440}		\usym{1F4F2}		\usym{1F5AE}
	\usym{1F310}		\usym{1F441}		\usym{1F4F3}		\usym{1F5AF}
	\usym{1F330}		\usym{1F442}		\usym{1F4F4}		\usym{1F5B0}
	\usym{1F358}		\usym{1F443}		\usym{1F4F5}		\usym{1F5B1}
	\usym{1F359}		\usym{1F444}		\usym{1F4F6}		\usym{1F5B2}
	\usym{1F380}		\usym{1F445}		\usym{1F4F7}		\usym{1F5B3}
	\usym{1F381}		\usym{1F463}		\usym{1F4F8}		\usym{1F5B5}
	\usym{1F383}		\usym{1F47B}		\usym{1F4F9}		\usym{1F5B6}
	\usym{1F384}		\usym{1F47C}		\usym{1F4FA}		\usym{1F5B7}
	\usym{1F385}		\usym{1F484}		\usym{1F4FB}		\usym{1F5B8}
	\usym{1F386}		\usym{1F485}		\usym{1F4FC}		\usym{1F5B9}
	\usym{1F387}		\usym{1F488}		\usym{1F4FD}		\usym{1F5BA}
	\usym{1F388}		\usym{1F489}		\usym{1F4FE}		\usym{1F5BB}
	\usym{1F389}		\usym{1F48A}		\usym{1F4FF}		\usym{1F5BC}
	\usym{1F38A}		\usym{1F4A0}		\usym{1F50B}		\usym{1F5BD}
	\usym{1F38B}		\usym{1F4A1}		\usym{1F50C}		\usym{1F5BE}
	\usym{1F38C}		\usym{1F4A2}		\usym{1F50D}		\usym{1F5BF}
	\usym{1F38D}		\usym{1F4A3}		\usym{1F50E}		\usym{1F5C0}

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	\usym{1F38E}		\usym{1F4A4}		\usym{1F50F}		\usym{1F5C1}
	\usym{1F38F}		\usym{1F4A5}		\usym{1F510}		\usym{1F5C2}
	\usym{1F390}		\usym{1F4A6}		\usym{1F511}		\usym{1F5C3}
	\usym{1F391}		\usym{1F4A7}		\usym{1F512}		\usym{1F5C4}
	\usym{1F392}		\usym{1F4A8}		\usym{1F513}		\usym{1F5C5}
	\usym{1F393}		\usym{1F4A9}		\usym{1F514}		\usym{1F5C6}
	\usym{1F395}		\usym{1F4AA}		\usym{1F515}		\usym{1F5C7}
	\usym{1F396}		\usym{1F4AB}		\usym{1F516}		\usym{1F5C8}
	\usym{1F397}		\usym{1F4AC}		\usym{1F517}		\usym{1F5C9}
	\usym{1F398}		\usym{1F4AD}		\usym{1F518}		\usym{1F5CA}
	\usym{1F399}		\usym{1F4AE}	BACK	\usym{1F519}		\usym{1F5CB}
	\usym{1F39A}		\usym{1F4AF}	END	\usym{1F51A}		\usym{1F5CC}
	\usym{1F39B}		\usym{1F4B0}	ON!	\usym{1F51B}		\usym{1F5CD}
	\usym{1F39E}		\usym{1F4B1}	SOON	\usym{1F51C}		\usym{1F5CE}
	\usym{1F39F}		\usym{1F4B2}	TOP	\usym{1F51D}		\usym{1F5CF}
	\usym{1F3A0}		\usym{1F4B3}		\usym{1F51E}		\usym{1F5D0}
	\usym{1F3A1}		\usym{1F4B4}		\usym{1F51F}		\usym{1F5D1}
	\usym{1F3A2}		\usym{1F4B5}		\usym{1F520}		\usym{1F5D2}
	\usym{1F3A3}		\usym{1F4B6}		\usym{1F521}		\usym{1F5D3}
	\usym{1F3A4}		\usym{1F4B7}		\usym{1F522}		\usym{1F5D4}
	\usym{1F3A5}		\usym{1F4B8}		\usym{1F523}		\usym{1F5D6}
	\usym{1F3A6}		\usym{1F4B9}		\usym{1F524}		\usym{1F5D7}
	\usym{1F3A7}		\usym{1F4BA}		\usym{1F525}		\usym{1F5D8}
	\usym{1F3A8}		\usym{1F4BB}		\usym{1F526}		\usym{1F5D9}
	\usym{1F3A9}		\usym{1F4BC}		\usym{1F527}	AA	\usym{1F5DA}
	\usym{1F3AA}		\usym{1F4BD}		\usym{1F528}	AA	\usym{1F5DB}
	\usym{1F3AB}		\usym{1F4BE}		\usym{1F529}		\usym{1F5DC}
	\usym{1F3AC}		\usym{1F4BF}		\usym{1F52A}		\usym{1F5DD}
	\usym{1F3AD}		\usym{1F4C0}		\usym{1F52B}		\usym{1F5DE}
	\usym{1F3B4}		\usym{1F4C1}		\usym{1F52C}		\usym{1F5DF}
	\usym{1F3B7}		\usym{1F4C2}		\usym{1F52D}		\usym{1F5E0}
	\usym{1F3B8}		\usym{1F4C3}		\usym{1F52E}		\usym{1F5E1}
	\usym{1F3B9}		\usym{1F4C4}		\usym{1F530}		\usym{1F5E2}
	\usym{1F3BA}		\usym{1F4C5}		\usym{1F531}		\usym{1F5E3}
	\usym{1F3BB}		\usym{1F4C6}		\usym{1F532}	\ | /	\usym{1F5E4}
	\usym{1F3BD}		\usym{1F4C7}		\usym{1F533}	/ | \	\usym{1F5E5}
	\usym{1F3D4}		\usym{1F4C8}		\usym{1F53E}		\usym{1F5E6}
	\usym{1F3D5}		\usym{1F4C9}		\usym{1F53F}		\usym{1F5E7}
	\usym{1F3D6}		\usym{1F4CA}		\usym{1F540}		\usym{1F5E8}
	\usym{1F3D7}		\usym{1F4CB}		\usym{1F541}		\usym{1F5E9}
	\usym{1F3D8}		\usym{1F4CC}		\usym{1F542}		\usym{1F5EA}
	\usym{1F3D9}		\usym{1F4CD}		\usym{1F54F}		\usym{1F5EB}
	\usym{1F3DA}		\usym{1F4CE}		\usym{1F56B}		\usym{1F5EC}
	\usym{1F3DB}		\usym{1F4CF}		\usym{1F56C}		\usym{1F5ED}
	\usym{1F3DC}		\usym{1F4D0}		\usym{1F56D}		\usym{1F5EE}
	\usym{1F3DD}		\usym{1F4D1}		\usym{1F56E}		\usym{1F5EF}

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	\usym{1F3DE}		\usym{1F4D2}		\usym{1F56F}		\usym{1F5F0}
	\usym{1F3DF}		\usym{1F4D3}		\usym{1F571}		\usym{1F5F1}
	\usym{1F3E0}		\usym{1F4D4}		\usym{1F572}		\usym{1F5F2}
	\usym{1F3E1}		\usym{1F4D5}		\usym{1F574}		\usym{1F5F3}
	\usym{1F3E2}		\usym{1F4D6}		\usym{1F575}		\usym{1F5FA}
	\usym{1F3E3}		\usym{1F4D7}		\usym{1F577}		\usym{1F5FB}
	\usym{1F3E4}		\usym{1F4D8}		\usym{1F578}		\usym{1F5FC}
	\usym{1F3E5}		\usym{1F4D9}		\usym{1F579}		\usym{1F5FD}
	\usym{1F3E6}		\usym{1F4DA}		\usym{1F57A}		\usym{1F5FE}
	\usym{1F3E7}		\usym{1F4DB}		\usym{1F57B}		\usym{1F5FF}
	\usym{1F3E8}		\usym{1F4DC}		\usym{1F57C}		\usym{1F573}
	\usym{1F3E9}		\usym{1F4DD}		\usym{1F57D}		\usym{1F576}
	\usym{1F3EA}		\usym{1F4DE}		\usym{1F57E}		\usym{1F5B4}
	\usym{1F3EB}		\usym{1F4DF}		\usym{1F57F}		\usym{1F5D5}
	\usym{1F3EC}		\usym{1F4E0}		\usym{1F580}		
	\usym{1F3ED}		\usym{1F4E1}		\usym{1F581}		
	\usym{1F3EE}		\usym{1F4E2}		\usym{1F582}		

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

Table 648: typicons Brand Icons

	\tiDropbox		\tiSocialLinkedinCircular
	\tiSocialAtCircular		\tiSocialPinterest
	\tiSocialDribbble		\tiSocialPinterestCircular
	\tiSocialDribbbleCircular		\tiSocialSkype
	\tiSocialFacebook		\tiSocialSkypeOutline
	\tiSocialFacebookCircular		\tiSocialTumbler
	\tiSocialFlickr		\tiSocialTumblerCircular
	\tiSocialFlickrCircular		\tiSocialTwitter
	\tiSocialGithub		\tiSocialTwitterCircular
	\tiSocialGithubCircular		\tiSocialVimeo
	\tiSocialGooglePlus		\tiSocialVimeoCircular
	\tiSocialGooglePlusCircular		\tiSocialYoutube
	\tiSocialInstagram		\tiSocialYoutubeCircular
	\tiSocialInstagramCircular		\tiVendorAndroid
	\tiSocialLastFm		\tiVendorApple
	\tiSocialLastFmCircular		\tiVendorMicrosoft
	\tiSocialLinkedin		

typicons requires either LuaLaTeX or XeLaTeX.

Table 649: fontawesome5 Brand Icons

	\faAccessibleIcon		\faGit		\faRaspberryPi
	\faAccusoft		\faGithub*		\faRavelry
	\faAcquisitionsIncorporated		\faGithub		\faReact
	\faAdn		\faGithubSquare		\faReacteurope
	\faAdversal		\faGitkraken		\faReadme
	\faAffiliatetheme		\faGitlab		\faRebel
	\faAirbnb		\faGitSquare		\faReddit
	\faAlgolia		\faGitter		\faRedditAlien
	\faAlipay		\faGlide		\faRedditSquare
	\faAmazon		\faGlideG		\faRedhat
	\faAmazonPay		\faGofore		\faRedRiver
	\faAmilia		\faGoodreads		\faRenren
	\faAndroid		\faGoodreadsG		\faReplyd
	\faAngellist		\faGoogle		\faResearchgate
	\faAngrycreative		\faGoogleDrive		\faResolving
	\faAngular		\faGooglePay		\faRev
	\faApper		\faGooglePlay		\faRocketchat
	\faApple		\faGooglePlus		\faRockrms
	\faApplePay		\faGooglePlusG		\faRProject
	\faAppStore		\faGooglePlusSquare		\faRust
	\faAppStoreIos		\faGoogleWallet		\faSafari
	\faArtstation		\faGratipay		\faSalesforce
	\faAsymmetrik		\faGrav		\faSass
	\faAtlassian		\faGripfire		\faSchlix
	\faAudible		\faGrunt		\faScribd
	\faAutoprefixer		\faGuilded		\faSearchengin
	\faAvianex		\faGulp		\faSellcast
	\faAviato		\faHackerNews		\faSellsy
	\faAws		\faHackerNewsSquare		\faServicestack
	\faBandcamp		\faHackerrank		\faShirtsinbulk
	\faBattleNet		\faHips		\faShopify
	\faBehance		\faHireAHelper		\faShopware
	\faBehanceSquare		\faHive		\faSimplybuilt
	\faBimobject		\faHooli		\faSistrix
	\faBitbucket		\faHornbill		\faSith
	\faBitcoin		\faHotjar		\faSketch
	\faBity		\faHouzz		\faSkyatlas
	\faBlackberry		\faHtml5		\faSkype
	\faBlackTie		\faHubspot		\faSlack
	\faBlogger		\faIcon{500px}		\faSlackHash
	\faBloggerB		\faIdeal		\faSlideshare
	\faBluetooth		\faImdb		\faSnapchat
	\faBluetoothB		\faInnosoft		\faSnapchatGhost

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\faBootstrap
\faBuffer
\faBuromobelexperte
\faBuyNLarge
\faBuysellads
\faCanadianMapleLeaf
\faCcAmazonPay
\faCcAmex
\faCcApplePay
\faCcDinersClub
\faCcDiscover
\faCcJcb
\faCcMastercard
\faCcPaypal
\faCcStripe
\faCcVisa
\faCentercode
\faCentos
\faChrome
\faChromecast
\faCloudflare
\faCloudscale
\faCloudsmith
\faCloudversify
\faCodepen
\faCodiepie
\faConfluence
\faConnectdevelop
\faContao
\faCottonBureau
\faCpanel
\faCriticalRole
\faCss3
\faCuttlefish
\faDailymotion
\faDAndD
\faDAndDBeyond
\faDashcube
\faDeezer
\faDelicious
\faDeploydog
\faDeskpro
\faDev
\faDeviantart
\faDhl
\faInstagram
\faInstagramSquare
\faInstalod
\faIntercom
\faInternetExplorer
\faInvision
\faIoxhost
\faItchIo
\faItunes
\faItunesNote
\faJava
\faJedi
\faJediOrder
\faJenkins
\faJira
\faJoget
\faJoomla
\faJs
\faJsfiddle
\faJsSquare
\faKaggle
\faKeybase
\faKeycdn
\faKickstarter
\faKickstarterK
\faKorvue
\faLaravel
\faLastfm
\faLastfmSquare
\faLeanpub
\faLess
\faLine
\faLinkedin
\faLinkedinIn
\faLinode
\faLinux
\faLyft
\faMagento
\faMailchimp
\faMandalorian
\faMarkdown
\faMastodon
\faMaxcdn
\faMdb
\faMedapps
\faSnapchatSquare
\faSoundcloud
\faSourcetree
\faSpeakap
\faSpeakerDeck
\faSpotify
\faSquarespace
\faStackExchange
\faStackOverflow
\faStackpath
\faStaylinked
\faSteam
\faSteamSquare
\faSteamSymbol
\faStickerMule
\faStrava
\faStripe
\faStripeS
\faStudiovinari
\faStumbleupon
\faStumbleuponCircle
\faSuperpowers
\faSupple
\faSuse
\faSwift
\faSymfony
\faTeamspeak
\faTelegram
\faTelegramPlane
\faTencentWeibo
\faThemeco
\faThemeisle
\faTheRedYeti
\faThinkPeaks
\faTiktok
\faTradeFederation
\faTrello
\faTumblr
\faTumblrSquare
\faTwitch
\faTwitter
\faTwitterSquare
\faTypo3
\faUber
\faUbuntu

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\faDiaspora
\faDigg
\faDigitalOcean
\faDiscord
\faDiscourse
\faDochub
\faDocker
\faDraft2digital
\faDropbox
\faDrupal
\faDyalog
\faEarlybirds
\faEbay
\faEdge
\faEdgeLegacy
\faElementor
\faEllo
\faEmber
\faEmpire
\faEnvira
\faErlang
\faEthereum
\faEtsy
\faEvernote
\faExpeditedssl
\faFacebook
\faFacebookF
\faFacebookMessenger
\faFacebookSquare
\faFantasyFlightGames
\faFedex
\faFedora
\faFigma
\faFirefox
\faFirefoxBrowser
\faFirstdraft
\faFirstOrder*
\faFirstOrder
\faFlickr
\faFlipboard
\faFly
\faFontAwesome*
\faFontAwesome
\faFontAwesomeFlag
\faFonticons
\faMedium
\faMediumM
\faMedrt
\faMeetup
\faMegaport
\faMendeley
\faMicroblog
\faMicrosoft
\faMix
\faMixcloud
\faMixer
\faMizuni
\faModx
\faMonero
\faNapster
\faNeos
\faNimblr
\faNode
\faNodeJs
\faNpm
\faNs8
\faNutritionix
\faOctopusDeploy
\faOdnoklassniki
\faOdnoklassnikiSquare
\faOldRepublic
\faOpencart
\faOpenid
\faOpera
\faOptinMonster
\faOrcid
\faOsi
\faPage4
\faPagelines
\faPalfed
\faPatreon
\faPaypal
\faPennyArcade
\faPerbyte
\faPeriscope
\faPhabricator
\faPhoenixFramework
\faPhoenixSquadron
\faPhp
\faPiedPiper*
\faUikit
\faUmbraco
\faUncharted
\faUniregistry
\faUnity
\faUnsplash
\faUntappd
\faUps
\faUsb
\faUsps
\faUssunnah
\faVaadin
\faViacoin
\faViadeo
\faViadeoSquare
\faViber
\faVimeo
\faVimeoSquare
\faVimeoV
\faVine
\faVk
\faVnv
\faVuejs
\faWatchmanMonitoring
\faWaze
\faWeebly
\faWeibo
\faWeixin
\faWhatsapp
\faWhatsappSquare
\faWhmcs
\faWikipediaW
\faWindows
\faWix
\faWizardsOfTheCoast
\faWodu
\faWolfPackBattalion
\faWordpress
\faWordpressSimple
\faWpbeginner
\faWpexplorer
\faWpforms
\faWpressr
\faXbox
\faXing

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\faFonticonsFi
\faFortAwesome*
\faFortAwesome
\faForumbee
\faFoursquare
\faFreebsd
\faFreeCodeCamp
\faFulcrum
\faGalacticRepublic
\faGalacticSenate
\faGetPocket
\faGg
\faGgCircle
\faGit*
\faPiedPiper
\faPiedPiperHat
\faPiedPiperPp
\faPiedPiperSquare
\faPinterest
\faPinterestP
\faPinterestSquare
\faPlaystation
\faProductHunt
\faPushed
\faPython
\faQq
\faQuinscape
\faQuora
\faXingSquare
\faYahoo
\faYammer
\faYandex
\faYandexInternational
\faYarn
\faYCombinator
\faYelp
\faYoast
\faYoutube
\faYoutubeSquare
\faZhihu

Table 650: fontmfizz Brand Icons

\mfAlpinelinux
\mfAngular
\mfAngularAlt
\mfApache
\mfArchlinux
\mfAws
\mfAzure
\mfBackbone
\mfBlackberry
\mfBootstrap
\mfC
\mfCassandra
\mfCentos
\mfClojure
\mfCodeigniter
\mfCodepen
\mfCoffeeBean
\mfCplusplus
\mfCsharp
\mfCss
\mfGoogle
\mfGoogleAlt
\mfGoogleCode
\mfGoogleDevelopers
\mfGradle
\mfGrails
\mfGrailsAlt
\mfGrunt
\mfGulp
\mfGulpAlt
\mfHadoop
\mfHaskell
\mfHeroku
\mfHtml
\mfHtmlfive
\mfHtmlfiveAlt
\mfJava
\mfJavaBold
\mfJavaDuke
\mfJavascript
\mfNpm
\mfObjc
\mfOpenshift
\mfOracle
\mfOracleAlt
\mfOsx
\mfPerl
\mfPhp
\mfPhpAlt
\mfPlayframework
\mfPlayframeworkAlt
\mfPlone
\mfPostgres
\mfPostgresAlt
\mfPython
\mfRaspberrypi
\mfReactjs
\mfRedhat
\mfRedis
\mfRuby

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	\mfCssthree		\mfJavascriptAlt		\mfRubyOnRails
	\mfCssthreeAlt		\mfJetty		\mfRubyOnRailsAlt
	\mfDebian		\mfJquery		\mfRust
	\mfDocker		\mfKde		\mfSass
	\mfDreamhost		\mfLaravel		\mfSatellite
	\mfDthree		\mfLinuxMint		\mfScala
	\mfElixir		\mfLooking		\mfScalaAlt
	\mfElm		\mfMagento		\mfSitefinity
	\mfErlang		\mfMariadb		\mfSolaris
	\mfExherbo		\mfMaven		\mfSpring
	\mfFedora		\mfMongodb		\mfSuse
	\mfFireAlt		\mfMssql		\mfSvg
	\mfFreebsd		\mfMysql		\mfSymfony
	\mfFreecodecamp		\mfMysqlAlt		\mfThreedprint
	\mfGentoo		\mfNetbsd		\mfTomcat
	\mfGit		\mfNginx		\mfUbuntu
	\mfGnome		\mfNginxAlt		\mfUnity
	\mfGo		\mfNginxAlttwo		\mfWordpress
	\mfGoAlt		\mfNodejs		\mfXeleven

fontmfizz requires either LuaLaTeX or XeLaTeX.

Table 651: fontawesome5 Medical Symbols

	\faAllergies		\faFirstAid		\faPills
	\faAmbulance		\faHeadSideCough		\faPrescription
	\faBacteria		\faHeadSideCoughSlash		\faPrescriptionBottle*
	\faBacterium		\faHeadSideMask		\faPrescriptionBottle
	\faBandAid		\faHeadSideVirus		\faProcedures
	\faBiohazard		\faHeartbeat		\faPumpMedical
	\faBookMedical		\faHospital*		\faShieldVirus
	\faBrain		\faHospital		\faStethoscope
	\faBriefcaseMedical		\faHospital[regular]		\faSyringe
	\faCapsules		\faHospitalSymbol		\faTablets
	\faClinicMedical		\faHospitalUser		\faVirus
	\faCommentMedical		\faLaptopMedical		\faViruses
	\faCrutch		\faLungs		\faVirusSlash
	\faDiagnoses		\faLungsVirus		\faXRay
	\faDisease		\faMedkit		
	\faDna		\faNotesMedical		

Table 652: fontawesome5 Disability Symbols

	\faAmericanSignLanguageInterpreting		\faLowVision
	\faAssistiveListeningSystems		\faSignLanguage
	\faBlind		\faTty
	\faBraille		\faWheelchair
	\faDeaf		

Table 653: asapsym Transportation Symbols

	\asapAirplaneLanding		\asapBoat
	\asapAirplaneOverhead		\asapBus
	\asapAirplaneTakeoff		\asapHelicopter
	\asapAutomobile		\asapTaxi
	\asapAutomobileWithKey		\asapTrain
	\asapBicycle		

asapsym requires either LuaLaTeX or XeLaTeX.

Table 654: twemojis Transportation Emoji

	\twemoji{1f6f0}		\twemoji{mountain railway}
	\twemoji{aerial tramway}		\twemoji{no bicycles}
	\twemoji{airplane}		\twemoji{oncoming automobile}
	\twemoji{airplane arrival}		\twemoji{oncoming bus}
	\twemoji{airplane departure}		\twemoji{oncoming police car}
	\twemoji{ambulance}		\twemoji{oncoming taxi}
	\twemoji{articulated lorry}		\twemoji{passenger ship}
	\twemoji{auto rickshaw}		\twemoji{passport control}
	\twemoji{automobile}		\twemoji{person biking}*
	\twemoji{baggage claim}		\twemoji{person mountain biking}*
	\twemoji{bicycle}		\twemoji{person rowing boat}*
	\twemoji{bullet train}		\twemoji{pickup truck}
	\twemoji{bus}		\twemoji{police car}
	\twemoji{bus stop}		\twemoji{police car light}
	\twemoji{canoe}		\twemoji{racing car}
	\twemoji{construction}		\twemoji{railway car}
	\twemoji{customs}		\twemoji{railway track}
	\twemoji{delivery truck}		\twemoji{rocket}
	\twemoji{fire engine}		\twemoji{roller skate}

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\twemoji{flying saucer}
\twemoji{helicopter}
\twemoji{high-speed train}
\twemoji{horizontal traffic light}
\twemoji{kick scooter}
\twemoji{left luggage}
\twemoji{light rail}
\twemoji{locomotive}
\twemoji{man biking}*
\twemoji{man mountain biking}*
\twemoji{man rowing boat}*
\twemoji{metro}
\twemoji{minibus}
\twemoji{monorail}
\twemoji{motor boat}
\twemoji{motor scooter}
\twemoji{motorcycle}
\twemoji{motorway}
\twemoji{mountain cableway}
\twemoji{ship}
\twemoji{skateboard}
\twemoji{sled}
\twemoji{small airplane}
\twemoji{speedboat}
\twemoji{sport utility vehicle}
\twemoji{station}
\twemoji{suspension railway}
\twemoji{taxi}
\twemoji{tractor}
\twemoji{train2}
\twemoji{tram}
\twemoji{tram car}
\twemoji{trolleybus}
\twemoji{vertical traffic light}
\twemoji{woman biking}*
\twemoji{woman mountain biking}*
\twemoji{woman rowing boat}*

Most twemojis symbols have multiple names. Only the most descriptive name for each symbol is shown in this table.

All twemojis symbols are implemented as PDF graphics, not with a font. See also the hwemoji package, which enables direct Unicode entry of emoji characters in pdfLaTeX; the emoji package, which provides a LuaLaTeX interface to different underlying emoji fonts; and the emo package, which uses a font if possible, otherwise PDF graphics .

* Variants of this symbol portraying different colors and styles are not shown. An example is presented after Table 632 on page 290. See the twemojis documentation for more information.

Table 655: asapsym Everyday Objects

\asapBook	\asapHanger	\asapMug
\asapCigarette	\asapMicroscope	\asapPhone
\asapEnvelope	\asapMobilePhone	\asapTablet
\asapGift	\asapMonitor	\asapUtensils

asapsym requires either LuaLaTeX or XeLaTeX.

Table 656: typicons Everyday Objects

	\tiAnchor		\tiFilm		\tiPinOutline
	\tiAnchorOutline		\tiFlag		\tiPiOutline
	\tiAttachment		\tiFlagOutline		\tiPipette
	\tiAttachmentOutline		\tiGift		\tiPlane
	\tiBeaker		\tiGlobe		\tiPlaneOutline
	\tiBeer		\tiGlobeOutline		\tiPlug
	\tiBell		\tiHeadphones		\tiPrinter
	\tiBook		\tiHome		\tiPuzzle
	\tiBriefcase		\tiHomeOutline		\tiPuzzleOutline
	\tiBrush		\tiKey		\tiScissors
	\tiBusinessCard		\tiKeyboard		\tiScissorsOutline
	\tiCalculator		\tiKeyOutline		\tiShoppingBag
	\tiCamera		\tiLeaf		\tiShoppingCart
	\tiCameraOutline		\tiLightbulb		\tiSpanner
	\tiClipboard		\tiLockClosed		\tiSpannerOutline
	\tiCoffee		\tiLockClosedOutline		\tiTag
	\tiCompass		\tiLockOpen		\tiTags
	\tiContacts		\tiLockOpenOutline		\tiTicket
	\tiCreditCard		\tiMail		\tiTrash
	\tiDeviceDesktop		\tiMap		\tiTree
	\tiDeviceLaptop		\tiMicrophone		\tiVideo
	\tiDevicePhone		\tiMicrophoneOutline		\tiVideoOutline
	\tiDeviceTablet		\tiMortarBoard		\tiWine
	\tiDirections		\tiNews		\tiWorld
	\tiEye		\tiPhone		\tiWorldOutline
	\tiEyeOutline		\tiPhoneOutline		
	\tiFeather		\tiPin		

typicons requires either LuaLaTeX or XeLaTeX.

Table 657: fontawesome5 Everyday Objects

	\faAirFreshener		\faGlassMartini		\faRocket
	\faAnchor		\faGlassWhiskey		\faRuler
	\faApple*		\faGraduationCap		\faRulerCombined
	\faArchive		\faGuitar		\faRulerHorizontal
	\faArchway		\faHamburger		\faRulerVertical
	\faAward		\faHammer		\faSatellite
	\faBaby		\faHardHat		\faSatelliteDish
	\faBabyCarriage		\faHatCowboy		\faSchool
	\faBacon		\faHatCowboySide		\faScrewdriver
	\faBath		\faHatWizard		\faScroll
	\faBed		\faHdd		\faSdCard
	\faBeer		\faHdd[regular]		\faSeedling
	\faBell		\faHeadphones*		\faShield*
	\faBell[regular]		\faHeadphones		\faShip
	\faBicycle		\faHeadset		\faShoePrints
	\faBinoculars		\faHelicopter		\faShoppingBag
	\faBirthdayCake		\faHome		\faShoppingBasket
	\faBlender		\faHotdog		\faShoppingCart
	\faBlenderPhone		\faHotel		\faShower
	\faBomb		\faHotTub		\faShuttleVan
	\faBone		\faIceCream		\faSign
	\faBong		\faIgloo		\faSimCard
	\faBox		\faJoint		\faSink
	\faBoxes		\faKey		\faSleigh
	\faBoxOpen		\faKeyboard		\faSmoking
	\faBoxTissue		\faKeyboard[regular]		\faSnowman
	\faBreadSlice		\faLandmark		\faSnowplow
	\faBriefcase		\faLaptop		\faSoap
	\faBroom		\faLeaf		\faSocks
	\faBrush		\faLemon		\faSolarPanel
	\faBuilding		\faLemon[regular]		\faSpaceShuttle
	\faBuilding[regular]		\faLifeRing		\faSprayCan
	\faBullhorn		\faLifeRing[regular]		\faStamp
	\faBus*		\faLightbulb		\faStickyNote
	\faBus		\faLightbulb[regular]		\faStickyNote[regular]
	\faCalculator		\faLock		\faStore*
	\faCamera		\faLockOpen		\faStore
	\faCameraRetro		\faLuggageCart		\faStroopwafel
	\faCandyCane		\faMagnet		\faSubway
	\faCannabis		\faMale		\faSuitcase
	\faCar*		\faMap		\faSuitcaseRolling
	\faCar		\faMap[regular]		\faSwatchbook

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\faCaravan
\faCarBattery
\faCarrot
\faCarSide
\faCashRegister
\faChair
\faChalkboard
\faCheese
\faChild
\faCity
\faCocktail
\faCoffee
\faCoins
\faCompactDisc
\faCompass
\faCompass[regular]
\faConciergeBell
\faCookie
\faCookieBite
\faCouch
\faCreditCard
\faCreditCard[regular]
\faCrown
\faDolly
\faDollyFlatbed
\faDoorClosed
\faDoorOpen
\faDraftingCompass
\faDrum
\faDrumSteelpan
\faDrumstickBite
\faDumpster
\faDungeon
\faEgg
\faEyeDropper
\faFan
\faFaucet
\faFax
\faFeather*
\faFeather
\faFemale
\faFighterJet
\faFireExtinguisher
\faFlask
\faMask
\faMedal
\faMemory
\faMeteor
\faMicrochip
\faMicrophone*
\faMicrophone
\faMicroscope
\faMitten
\faMobile*
\faMobile
\faMoneyBill*[regular]
\faMoneyBill*
\faMoneyBill
\faMoneyBillWave*
\faMoneyBillWave
\faMoneyCheck*
\faMoneyCheck
\faMonument
\faMoon
\faMoon[regular]
\faMortarPestle
\faMotorcycle
\faMountain
\faMouse
\faMugHot
\faNewspaper
\faNewspaper[regular]
\faOilCan
\faPager
\faPaintBrush
\faPaintRoller
\faPalette
\faPallet
\faPaperclip
\faPaperPlane
\faPaperPlane[regular]
\faParachuteBox
\faPencilRuler
\faPepperHot
\faPhone*
\faPhone
\faPiggyBank
\faPizzaSlice
\faSwimmingPool
\faTablet*
\faTablet
\faTag
\faTags
\faTape
\faTaxi
\faTeeth
\faTeethOpen
\faTheaterMasks
\faThermometer
\faThumbtack
\faTicket*
\faToilet
\faToiletPaper
\faToolbox
\faTools
\faTooth
\faTractor
\faTrafficLight
\faTrailer
\faTrain
\faTram
\faTrash*[regular]
\faTrash*
\faTrash
\faTree
\faTrophy
\faTruck
\faTruckLoading
\faTruckMonster
\faTruckMoving
\faTruckPickup
\faTshirt
\faTv
\faUmbrella
\faUmbrellaBeach
\faUniversity
\faUnlock*
\faUnlock
\faUtensils
\faUtensilSpoon
\faVest
\faVestPatches

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\faGamepad
\faGasPump
\faGavel
\faGem
\faGem[regular]
\faGhost
\faGift
\faGifts
\faGlassCheers
\faGlasses
\faGlassMartini*
\faPlane
\faPlug
\faPumpSoap
\faPuzzlePiece
\faRainbow
\faReceipt
\faRecordVinyl
\faRibbon
\faRing
\faRoad
\faRobot
\faVial
\faVials
\faVrCardboard
\faWallet
\faWarehouse
\faWeightHanging
\faWineBottle
\faWineGlass*
\faWineGlass
\faWrench

Table 658: figchild Everyday Objects

\fcAbajourA
\fcAbajourB
\fcAbajourC
\fcAbajourD
\fcAlarmClockA
\fcAlarmClockB
\fcAppleTree
\fcBabe
\fcBall
\fcBallA
\fcBallB
\fcBallC
\fcEar
\fcExcavator
\fcFaceTowel
\fcFan
\fcFanA
\fcFlashlight
\fcFlower
\fcFlowerA
\fcFlowerB
\fcFlowerC
\fcFlowerD
\fcFlowerE
\fcRazor
\fcRobe
\fcSandal
\fcSchoolbag
\fcScissors
\fcScooter
\fcSeeds
\fcSheet
\fcsheetA
\fcsheetB
\fcShip
\fcShower

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\fcBalloon

\fcBaloonsA

\fcBaloonsB

\fcBarquet

\fcBaseballBat

\fcBed

\fcBellA

\fcBike

\fcBinoculars

\fcBoat

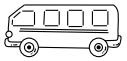
\fcBonnet

\fcBookA

\fcBookB

\fcBroom

\fcBud

 \fcBus

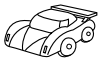
\fcCactoopuntia

\fcCactusA

\fcCactusB

\fcCandle

\fcCar

 \fcCarA

\fcCart

\fcFlowerF

\fcFlowerG

\fcFlowerH

\fcFlowerP

\fcGlass

\fcGloves

\fcHand

\fcHat

\fcHatA

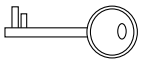
\fcHelicopter

\fcHouse

\fcHouseA

\fcHouseB

\fcJuicy

 \fcKey

\fcKite

\fcKiteA

\fcKnees

\fcLamp

\fcLanguage

\fcLightBulb

\fcLightning

\fcMailbox

\fcSleepingBag

\fcSnowflake

\fcSock

\fcSofaA

\fcSofaB

\fcSpray

\fcSteamroller

\fcStoolA

\fcStoolB

\fcStoolC

\fcSubmarineA

\fcTableLight

\fcTelevision

\fcTent

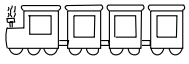
\fcThroat

\fcToiletPaper

\fcTornado

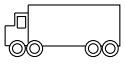
\fcTractorA

\fcTractorB

 \fcTrain

\fcTree

\fcTricycle

 \fcTruck

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\fcCartA

\fcCellPhone

\fcChairA

\fcChairB

\fcChairC

\fcChairD

\fcChristmasTree

\fcChrysanthemum

\fcCoach

\fcComb

\fcComputer

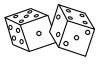
\fcCrane

\fcCrownA

\fcCushion

\fcDaisy

\fcDarts


\fcData

\fcDressingTable

\fcDryer

\fcMailBoxA

\fcMat

\fcMeton

\fcMill

\fcMirror

\fcMonster

\fcMotorcycle

\fcMotorcycleA

\fcNose

\fcPalmTree

\fcPencil

\fcPencilA

\fcPhone

\fcpink

\fcPlane

\fcPlaneA

\fcPumpkinA

\fcPyramid

\fcRake

\fcTruckA

\fcTruckB

\fcTruckC

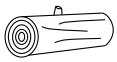
\fcTruckD

\fcTruckE

\fcTruckF

\fcTruckG

\fcTruckH


\fcTrunk

\fcTulip

\fcUmbrella

\fcVan

\fcVase

\fcWagon

\fcWardrobe

\fcWateringCan

\fcYoyo

Table 659: Miscellaneous asapsym Symbols

✚	\asapCross		\asapLocker
	\asapDog		\asapLostAndFound

asapsym requires either LuaLaTeX or XeLaTeX.

Table 660: Miscellaneous typicons Symbols

@	\tiAt		\tiHeartHalfOutline		\tiPointOfInterestOutline
	\tiFlash		\tiHeartOutline		\tiRadar
	\tiFlashOutline		\tiNotes		\tiRadarOutline
	\tiHeart		\tiNotesOutline		\tiSpiral
	\tiHeartFullOutline		\tiPointOfInterest		

typicons requires either LuaLaTeX or XeLaTeX.

Table 661: Miscellaneous fontawesome5 Symbols

	\faAtlas		\faGlobe		\faPersonBooth
	\faAtom		\faGlobeAfrica		\faPhoneSlash
	\faBalanceScale		\faGlobeAmericas		\faPhoneSquare*
	\faBalanceScaleLeft		\faGlobeAsia		\faPhoneSquare
	\faBalanceScaleRight		\faGlobeEurope		\faPhoneVolume
	\faBan		\faHeart		\faPlaneArrival
	\faBarcode		\faHeart[regular]		\faPlaneDeparture
	\faBezierCurve		\faHeartBroken		\faPlaneSlash
	\faBolt		\faHiking		\faPoo
	\faBook		\faHollyBerry		\faPoop
	\faBookDead		\faHouseDamage		\faPooStorm
	\faBookOpen		\faHouseUser		\faRadiation*
	\faBookReader		\faHSquare		\faRadiation
	\faBroadcastTower		\faIdBadge		\faRepublican
	\faBullseye		\faIdBadge[regular]		\faRestroom
	\faBurn		\faIdCard*		\faRunning
	\faCampground		\faIdCard		\faShippingFast
	\faCarCrash		\faIdCard[regular]		\faSkull
	\faCertificate		\faIndustry		\faSkullCrossbones
	\faChalkboardTeacher		\faJournalWhills		\faSmokingBan
	\faChargingStation		\faLaptopHouse		\faSpa
	\faClipboardList		\faMagic		\faSplotch
	\faCogs		\faMapSigns		\faToiletPaperSlash
	\faCube		\faMercury		\faVoteYea
	\faCubes		\faParking		\faWalking
	\faDemocrat		\faPassport		\faWater
	\faDirections		\faPaw		\faWaveSquare
	\faDumpsterFire		\faPeace		\faWeight
	\faFire		\faPeopleArrows		
	\faFunnelDollar		\faPeopleCarry		

Table 662: Miscellaneous fontmfizz Symbols

\mfAntenna	\mfBomb	\mfDatabase	\mfDatabaseAlt	\mfDatabaseAlttwo	\mfGhost
\mfIphone	\mfLineGraph	\mfMicroscope	\mfMobileDevice	\mfMobilePhoneAlt	\mfMobilePhoneBroadcast
\mfPhoneAlt	\mfPhoneGap	\mfPhoneRetro	\mfScript	\mfScriptAlt	\mfShell
\mfSplatter	\mfWireless				

fontmfizz requires either LuaLaTeX or XeLaTeX.

Table 663: rubikcube Rubik's Cube Rotations

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

All rubikcube symbols are implemented with Ti*k*Z 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.

Table 664: sacsymb Orchestrated Objective Reduction Symbols

\ca	\cb	\cc	\cd	\ce	\cf	\cg	\ch	\ci	\cj	\ck	\cl
\cm	\cn	\co	\cq	\cs	\ct	\cu	\cv	\cw			

All sacsymb symbols are implemented with Ti*k*Z graphics, not with a font.

Table 665: academicons Online Academic Profile Icons

A	\aiAcademia		\aiFigshare		\aiOrcid
	\aiAcademiaSquare		\aiFigshareSquare		\aiOrcidSquare
	\aiAcclaim		\aiGoogleScholar		\aiOSF
	\aiAcclaimSquare		\aiGoogleScholarSquare		\aiOSFSquare
	\aiACM		\aiHAL		\aiOverleaf
	\aiACMDL		\aiHALSquare		\aiOverleafSquare
	\aiACMDLSquare		\aiHypothesis		\aiPhilPapers
	\aiACMSquare		\aiHypothesisSquare		\aiPhilPapersSquare
	\aiADS		\aiIDEASRePEc	ρ	\aiPiazza
	\aiADSSquare		\aiIDEASRePEcSquare		\aiPiazzaSquare
	\aiAfricArXiv		\aiIEEE		\aiPreregistered
	\aiAfricArXivSquare		\aiIEEESquare		\aiPreregisteredSquare
	\aiArchive		\aiImpactstory		\aiProtocols
	\aiArchiveSquare		\aiImpactstorySquare		\aiProtocolsSquare
	\aiarXiv		\aiiNaturalist		\aiPsyArXiv
	\aiarXivSquare		\aiiNaturalistSquare		\aiPsyArXivSquare
Rχ	\aibioRxiv		\aiINPN	p	\aiPublons
	\aibioRxivSquare		\aiINPNSquare		\aiPublonsSquare
	\aiCEUR		\aiInspire		\aiPubMed
	\aiCEURSquare		\aiInspireSquare		\aiPubMedSquare
	\aiCIENCIAVITAE		\aiISIDORE		\aiPubPeer
	\aiCIENCIAVITAESquare		\aiISIDORESquare		\aiPubPeerSquare
	\aiClosedAccess	J	\aiJSTOR	R	\aiResearcherID
	\aiClosedAccessSquare		\aiJSTORSquare		\aiResearcherIDSquare
	\aiConversation		\aiLattes	R^G	\aiResearchGate
	\aiConversationSquare		\aiLattesSquare		\aiResearchGateSquare
	\aiCoursera		\aiMathOverflow	ROR	\aiROR
	\aiCourseraSquare		\aiMathOverflowSquare		\aiRORSquare
	\aiCrossref		\aiMendeley		\aiSciHub
	\aiCrossrefSquare		\aiMendeleySquare		\aiSciHubSquare
CV	\aiCV		\aiMoodle	Ψ	\aiSciRate
	\aiCVSquare		\aiMoodleSquare		\aiSciRateSquare
	\aiDataCite		\aiMTMT	SC	\aiScopus
	\aiDataCiteSquare		\aiMTMTSquare		\aiScopusSquare
	\aiDataverse		\aiNAKALA		\aiSemanticScholar
	\aiDataverseSquare		\aiNAKALASquare		\aiSemanticScholarSquare
	\aidblp		\aiOBP		\aiSpringer
	\aidblpSquare		\aiOBPSquare		\aiSpringerSquare
	\aiDepsy		\aiOpenAccess	SSRN	\aiSSRN
	\aiDepsySquare		\aiOpenAccessSquare		\aiSSRNSquare
	\aiDoi		\aiOpenData		\aiStackOverflow
	\aiDoiSquare		\aiOpenDataSquare		\aiStackOverflowSquare
	\aiDryad		\aiOpenEdition		\aiZenodo

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	`\aiDryadSquare`		`\aiOpenEditionSquare`		`\aiZenodoSquare`
E	`\aiElsevier`		`\aiOpenMaterials`	Z	`\aiZotero`
	`\aiElsevierquare`		`\aiOpenMaterialsSquare`		`\aiZoteroSquare`

academicons requires either LuaLaTeX or XeLaTeX.

Table 666: Miscellaneous figchild Symbols

	`\fcAngel`		`\fcGhost`		`\fcPassB`
	`\fcEyebrows`		`\fcLoveLetter`		`\fcWitchHat`
	`\fcEyes`		`\fcPassA`		

All figchild symbols are implemented with Ti*k*Z graphics, not with a font. Not shown above, each symbol takes three arguments: a scale factor, a line color, and a line thickness. See the figchild documentation for more information.

Chapter 11

Fonts with minimal LaTeX support

The symbol fonts shown in this chapter are provided without a corresponding LaTeX 2_ε 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 LaTeX font family. Alas, most of the fonts in this chapter do not even define a LaTeX font family. Hence, except where otherwise specified, a document will need to include code like the following in its preamble:

```
\usepackage{pifont}
\DeclareFontFamily{U}{⟨name⟩}{}
\DeclareFontShape{U}{⟨name⟩}{m}{n}{<-> ⟨font⟩}{}
```

where ⟨*font*⟩ is the name of the `.tfm` font file (or `.mf` font file, from which a `.tfm` font file can be generated automatically), and ⟨*name*⟩ is a name to use to refer to that font. It's generally good practice to use the name of the font file for ⟨*name*⟩, as in the following:

```
\usepackage{pifont}
\DeclareFontFamily{U}{hands}{}
\DeclareFontShape{U}{hands}{m}{n}{<-> hands}{}
```

TABLE 667: hands Fists

☞	`\Pisymbol{hands}{65}`	☞	`\Pisymbol{hands}{67}`
☜	`\Pisymbol{hands}{66}`	☜	`\Pisymbol{hands}{68}`

TABLE 668: greenpoint Recycling Symbols

↻	`\Pisymbol{greenpoint}{71}`

Table 669: 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}
	\Pisymbol{nkarta}{45}	□	\Pisymbol{nkarta}{108}		\Pisymbol{nkarta}{205}
	\Pisymbol{nkarta}{46}		\Pisymbol{nkarta}{109}		\Pisymbol{nkarta}{206}
	\Pisymbol{nkarta}{47}		\Pisymbol{nkarta}{110}		\Pisymbol{nkarta}{207}
0	\Pisymbol{nkarta}{48}	◯	\Pisymbol{nkarta}{111}		\Pisymbol{nkarta}{208}
1	\Pisymbol{nkarta}{49}	◇	\Pisymbol{nkarta}{112}		\Pisymbol{nkarta}{209}
2	\Pisymbol{nkarta}{50}		\Pisymbol{nkarta}{113}	↙	\Pisymbol{nkarta}{210}
3	\Pisymbol{nkarta}{51}		\Pisymbol{nkarta}{114}	←	\Pisymbol{nkarta}{211}
4	\Pisymbol{nkarta}{52}		\Pisymbol{nkarta}{115}	↓	\Pisymbol{nkarta}{212}
5	\Pisymbol{nkarta}{53}		\Pisymbol{nkarta}{116}	↑	\Pisymbol{nkarta}{213}
6	\Pisymbol{nkarta}{54}		\Pisymbol{nkarta}{117}		\Pisymbol{nkarta}{214}
7	\Pisymbol{nkarta}{55}		\Pisymbol{nkarta}{118}		\Pisymbol{nkarta}{215}
8	\Pisymbol{nkarta}{56}		\Pisymbol{nkarta}{119}		\Pisymbol{nkarta}{216}
9	\Pisymbol{nkarta}{57}		\Pisymbol{nkarta}{120}		\Pisymbol{nkarta}{217}
⊡	\Pisymbol{nkarta}{58}		\Pisymbol{nkarta}{121}	●	\Pisymbol{nkarta}{218}
⊙	\Pisymbol{nkarta}{59}	*i*	\Pisymbol{nkarta}{122}		\Pisymbol{nkarta}{219}
	\Pisymbol{nkarta}{60}		\Pisymbol{nkarta}{123}	■	\Pisymbol{nkarta}{220}
	\Pisymbol{nkarta}{61}	↗	\Pisymbol{nkarta}{124}	●	\Pisymbol{nkarta}{221}
	\Pisymbol{nkarta}{62}	↖	\Pisymbol{nkarta}{125}		\Pisymbol{nkarta}{222}
	\Pisymbol{nkarta}{63}		\Pisymbol{nkarta}{126}		\Pisymbol{nkarta}{223}
□	\Pisymbol{nkarta}{64}		\Pisymbol{nkarta}{161}	■	\Pisymbol{nkarta}{224}
❄	\Pisymbol{nkarta}{65}	◆	\Pisymbol{nkarta}{162}		\Pisymbol{nkarta}{225}
	\Pisymbol{nkarta}{66}	▲	\Pisymbol{nkarta}{163}		\Pisymbol{nkarta}{226}
	\Pisymbol{nkarta}{67}		\Pisymbol{nkarta}{164}	•	\Pisymbol{nkarta}{227}
▲	\Pisymbol{nkarta}{68}		\Pisymbol{nkarta}{165}		\Pisymbol{nkarta}{228}
☆	\Pisymbol{nkarta}{69}		\Pisymbol{nkarta}{166}	☆	\Pisymbol{nkarta}{229}
	\Pisymbol{nkarta}{70}		\Pisymbol{nkarta}{167}	○	\Pisymbol{nkarta}{230}
	\Pisymbol{nkarta}{71}		\Pisymbol{nkarta}{168}		\Pisymbol{nkarta}{231}
	\Pisymbol{nkarta}{72}		\Pisymbol{nkarta}{169}		\Pisymbol{nkarta}{232}
	\Pisymbol{nkarta}{73}	■	\Pisymbol{nkarta}{170}		\Pisymbol{nkarta}{233}

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	\Pisymbol{nkarta}{74}		\Pisymbol{nkarta}{171}		\Pisymbol{nkarta}{234}
	\Pisymbol{nkarta}{75}		\Pisymbol{nkarta}{172}		\Pisymbol{nkarta}{235}
	\Pisymbol{nkarta}{76}		\Pisymbol{nkarta}{173}		\Pisymbol{nkarta}{236}
	\Pisymbol{nkarta}{77}		\Pisymbol{nkarta}{174}		\Pisymbol{nkarta}{237}
	\Pisymbol{nkarta}{78}		\Pisymbol{nkarta}{175}		\Pisymbol{nkarta}{238}
	\Pisymbol{nkarta}{79}		\Pisymbol{nkarta}{176}		\Pisymbol{nkarta}{239}
	\Pisymbol{nkarta}{80}		\Pisymbol{nkarta}{177}		\Pisymbol{nkarta}{240}
	\Pisymbol{nkarta}{81}		\Pisymbol{nkarta}{178}		\Pisymbol{nkarta}{241}
	\Pisymbol{nkarta}{82}		\Pisymbol{nkarta}{179}		\Pisymbol{nkarta}{242}
	\Pisymbol{nkarta}{83}		\Pisymbol{nkarta}{180}		\Pisymbol{nkarta}{243}
	\Pisymbol{nkarta}{84}		\Pisymbol{nkarta}{181}		\Pisymbol{nkarta}{244}
	\Pisymbol{nkarta}{85}		\Pisymbol{nkarta}{182}		\Pisymbol{nkarta}{245}
	\Pisymbol{nkarta}{86}		\Pisymbol{nkarta}{183}		\Pisymbol{nkarta}{246}
	\Pisymbol{nkarta}{87}		\Pisymbol{nkarta}{184}		\Pisymbol{nkarta}{247}
	\Pisymbol{nkarta}{88}		\Pisymbol{nkarta}{185}		\Pisymbol{nkarta}{248}
	\Pisymbol{nkarta}{89}		\Pisymbol{nkarta}{186}		\Pisymbol{nkarta}{249}
	\Pisymbol{nkarta}{90}		\Pisymbol{nkarta}{187}		\Pisymbol{nkarta}{250}
	\Pisymbol{nkarta}{91}		\Pisymbol{nkarta}{188}		\Pisymbol{nkarta}{251}
	\Pisymbol{nkarta}{92}		\Pisymbol{nkarta}{189}		\Pisymbol{nkarta}{252}
	\Pisymbol{nkarta}{93}		\Pisymbol{nkarta}{190}		\Pisymbol{nkarta}{253}
	\Pisymbol{nkarta}{94}		\Pisymbol{nkarta}{191}		\Pisymbol{nkarta}{254}
	\Pisymbol{nkarta}{95}		\Pisymbol{nkarta}{192}		

Table 670: moonphase Astronomical Symbols

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

Table 671: 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}
♁	\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}

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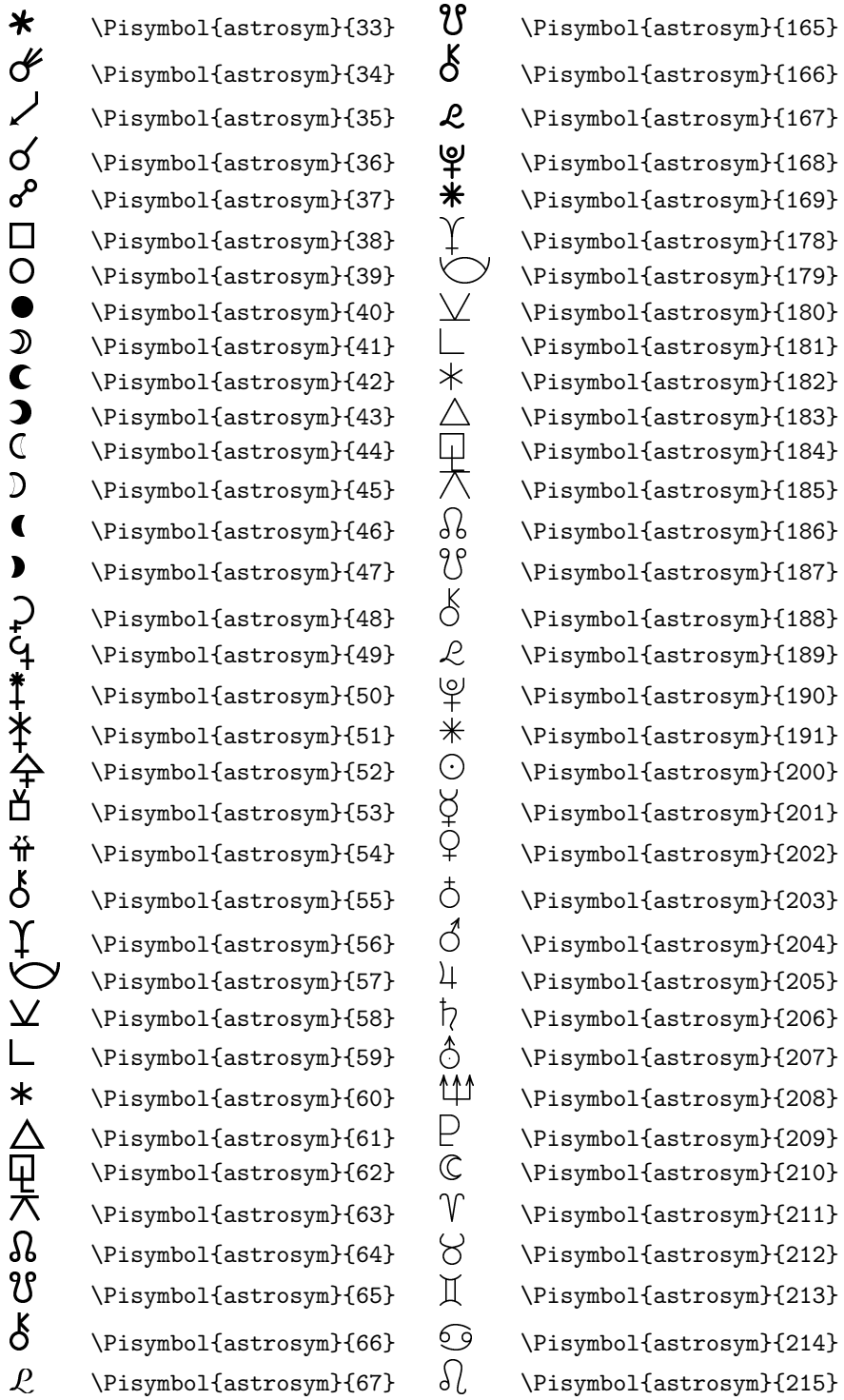

\Pisymbol{astrosym}{33}		\Pisymbol{astrosym}{165}	
\Pisymbol{astrosym}{34}		\Pisymbol{astrosym}{166}	
\Pisymbol{astrosym}{35}		\Pisymbol{astrosym}{167}	
\Pisymbol{astrosym}{36}		\Pisymbol{astrosym}{168}	
\Pisymbol{astrosym}{37}		\Pisymbol{astrosym}{169}	
\Pisymbol{astrosym}{38}		\Pisymbol{astrosym}{178}	
\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}	
\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}	

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⚵	\Pisymbol{astrosym}{68}	♍	\Pisymbol{astrosym}{216}
⚹	\Pisymbol{astrosym}{69}	♎	\Pisymbol{astrosym}{217}
☺	\Pisymbol{astrosym}{90}	♏	\Pisymbol{astrosym}{218}
☻	\Pisymbol{astrosym}{91}	♐	\Pisymbol{astrosym}{219}
☾	\Pisymbol{astrosym}{92}	♑	\Pisymbol{astrosym}{220}
☽	\Pisymbol{astrosym}{93}	♒	\Pisymbol{astrosym}{221}
☾	\Pisymbol{astrosym}{94}	♓	\Pisymbol{astrosym}{222}
☽	\Pisymbol{astrosym}{95}	♄	\Pisymbol{astrosym}{223}
⊙	\Pisymbol{astrosym}{100}	♆	\Pisymbol{astrosym}{224}
☿	\Pisymbol{astrosym}{101}	♇	\Pisymbol{astrosym}{225}
♀	\Pisymbol{astrosym}{102}	♁	\Pisymbol{astrosym}{226}
♁	\Pisymbol{astrosym}{103}	♒	\Pisymbol{astrosym}{227}
♂	\Pisymbol{astrosym}{104}	♒	\Pisymbol{astrosym}{228}
♃	\Pisymbol{astrosym}{105}	⊕	\Pisymbol{astrosym}{229}
♄	\Pisymbol{astrosym}{106}	♂	\Pisymbol{astrosym}{230}
⚷	\Pisymbol{astrosym}{107}	♇	\Pisymbol{astrosym}{231}
♆	\Pisymbol{astrosym}{108}	♎	\Pisymbol{astrosym}{232}
♇	\Pisymbol{astrosym}{109}	✳	\Pisymbol{astrosym}{233}
☾	\Pisymbol{astrosym}{110}	☌	\Pisymbol{astrosym}{234}
♈	\Pisymbol{astrosym}{111}	☄	\Pisymbol{astrosym}{235}
♉	\Pisymbol{astrosym}{112}	☌	\Pisymbol{astrosym}{236}
♊	\Pisymbol{astrosym}{113}	☍	\Pisymbol{astrosym}{237}
♋	\Pisymbol{astrosym}{114}	□	\Pisymbol{astrosym}{238}
♌	\Pisymbol{astrosym}{115}	○	\Pisymbol{astrosym}{239}
♍	\Pisymbol{astrosym}{116}	●	\Pisymbol{astrosym}{240}
♎	\Pisymbol{astrosym}{117}	☽	\Pisymbol{astrosym}{241}
♏	\Pisymbol{astrosym}{118}	☾	\Pisymbol{astrosym}{242}
♐	\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}

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♒	\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 672: 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}
	\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}

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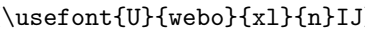
	`\Pisymbol{WebOMintsGD}{83}`		`\Pisymbol{WebOMintsGD}{120}`
	`\Pisymbol{WebOMintsGD}{84}`		`\Pisymbol{WebOMintsGD}{121}`
	`\Pisymbol{WebOMintsGD}{85}`		`\Pisymbol{WebOMintsGD}{122}`
	`\Pisymbol{WebOMintsGD}{86}`		

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}{xl}{n}\char73\char74}`—alternatively, `{\usefont{U}{webo}{xl}{n}IJ}`—will typeset "  ". This can be useful for typesetting a number of webomints glyphs in a row.

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

Table 673: umranda Decorative Borders

	`\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}`
	`\Pisymbol{umranda}{15}`		`\Pisymbol{umranda}{49}`		`\Pisymbol{umranda}{83}`
	`\Pisymbol{umranda}{16}`		`\Pisymbol{umranda}{50}`		`\Pisymbol{umranda}{84}`

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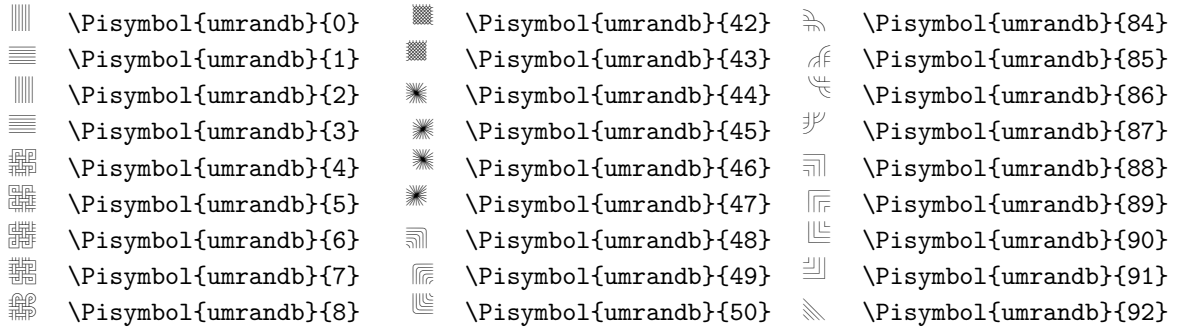
\Pisymbol{umranda}{17}	\Pisymbol{umranda}{51}	\Pisymbol{umranda}{85}
\Pisymbol{umranda}{18}	\Pisymbol{umranda}{52}	\Pisymbol{umranda}{86}
\Pisymbol{umranda}{19}	\Pisymbol{umranda}{53}	\Pisymbol{umranda}{87}
\Pisymbol{umranda}{20}	\Pisymbol{umranda}{54}	\Pisymbol{umranda}{88}
\Pisymbol{umranda}{21}	\Pisymbol{umranda}{55}	\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 674: 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}

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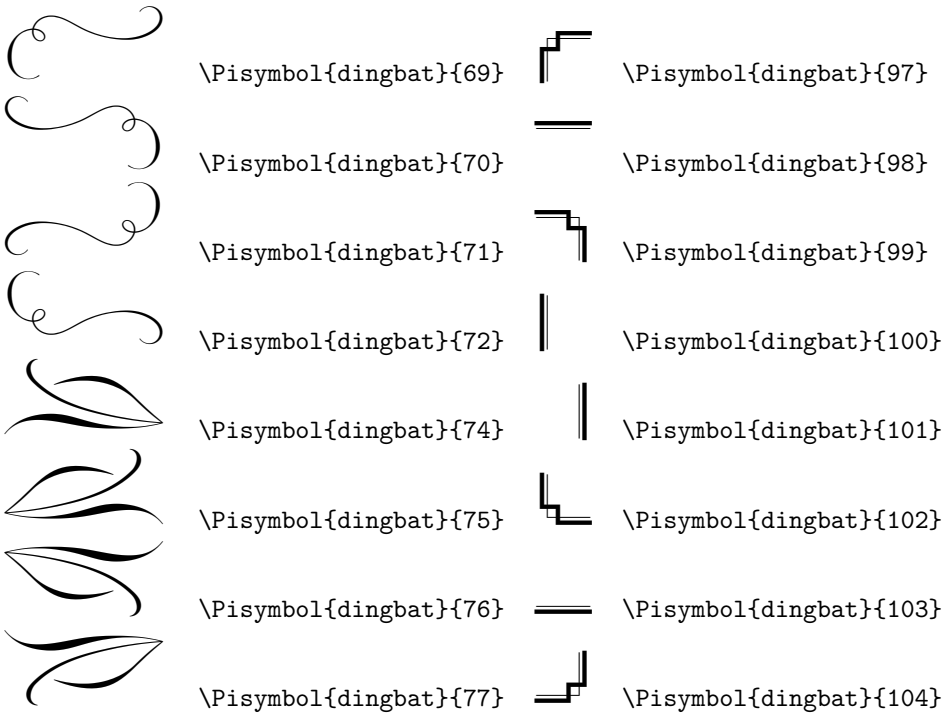
The niceframe package can be used to typeset decorative frames using fonts such as umrandb.

Table 675: 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 403 and Table 451 (both intermixed with symbols from the ark10 font).

The dingbat package includes a udingbat.fd file so a document does not need to specify the \DeclareFontFamily and \DeclareFontShape commands list at the beginning of Chapter 11.

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

Table 676: pgfornament Decorative Borders (Vintage)

\pgfornament{1}		\pgfornament{102}	
\pgfornament{2}		\pgfornament{103}	
\pgfornament{3}		\pgfornament{104}	
\pgfornament{4}		\pgfornament{105}	
\pgfornament{5}		\pgfornament{106}	
\pgfornament{6}		\pgfornament{107}	
\pgfornament{7}		\pgfornament{108}	
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\pgfornament{10}		\pgfornament{111}	
\pgfornament{11}		\pgfornament{112}	
\pgfornament{12}		\pgfornament{113}	
\pgfornament{13}		\pgfornament{114}	
\pgfornament{14}		\pgfornament{115}	
\pgfornament{15}		\pgfornament{116}	
\pgfornament{16}		\pgfornament{117}	
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\pgfornament{18}		\pgfornament{119}	
\pgfornament{19}		\pgfornament{120}	
\pgfornament{20}		\pgfornament{121}	
\pgfornament{21}		\pgfornament{122}	
\pgfornament{22}		\pgfornament{123}	
\pgfornament{23}		\pgfornament{124}	
\pgfornament{24}		\pgfornament{125}	
\pgfornament{25}		\pgfornament{126}	
\pgfornament{26}		\pgfornament{127}	
\pgfornament{27}		\pgfornament{128}	
\pgfornament{28}		\pgfornament{129}	
\pgfornament{29}		\pgfornament{130}	
\pgfornament{30}		\pgfornament{131}	
\pgfornament{31}		\pgfornament{132}	
\pgfornament{32}		\pgfornament{133}	

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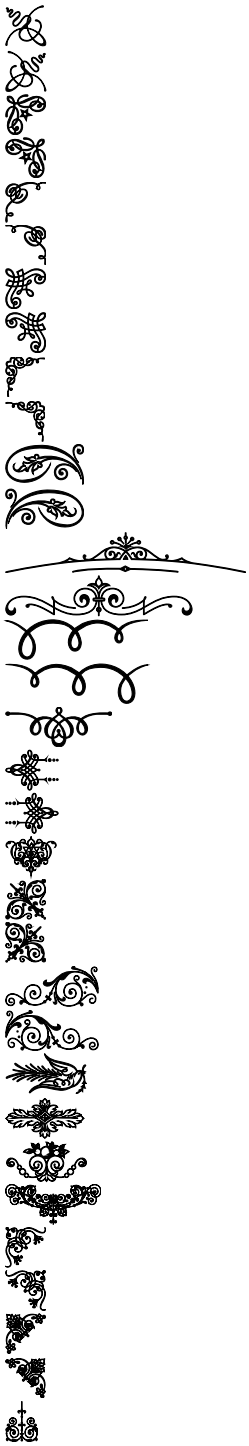

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\pgfornament{166}

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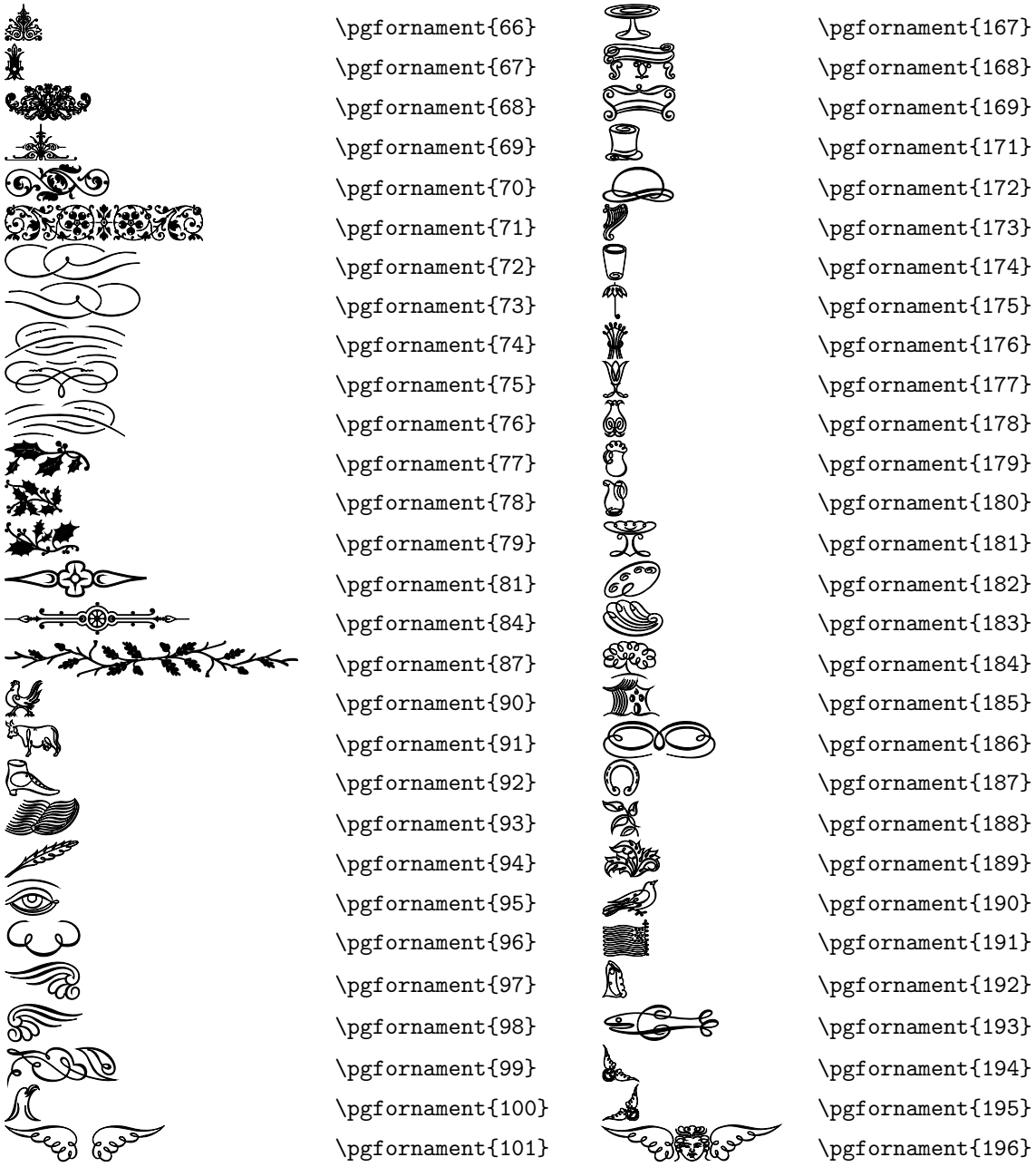

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\pgfornament{193}
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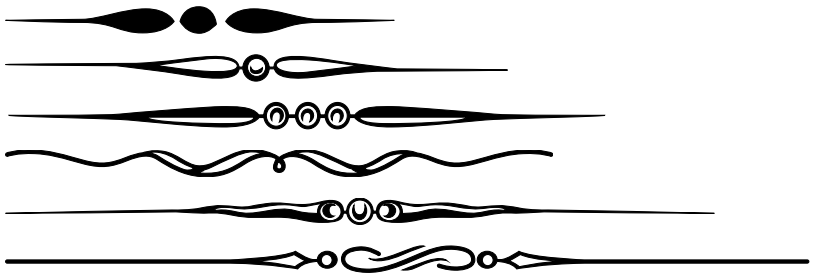
\pgfornament{195}
\pgfornament{196}

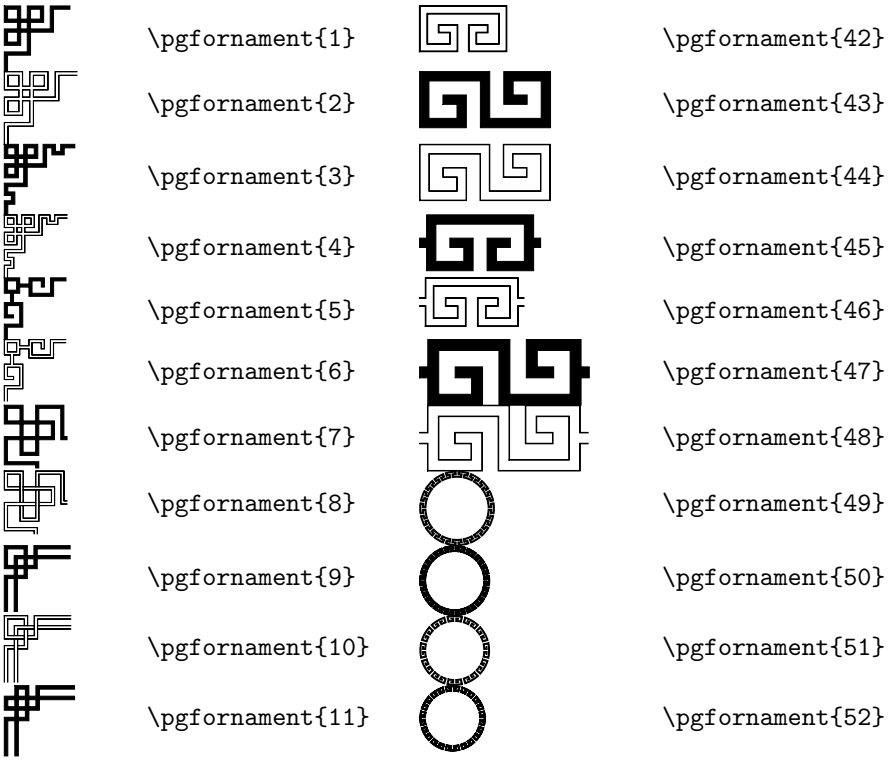
The symbols in this table are selected with `\newpgfornamentfamily {vectorian}`. All pgfornament symbols are implemented with Ti*k*Z graphics, not with a font. The `\pgfornament` command supports resizing, coloring, and rotating symbols. See the pgfornament documentation for more information.

The following symbols are omitted from the table due to their width:



`\pgfornament{80}`
`\pgfornament{82}`
`\pgfornament{83}`
`\pgfornament{85}`
`\pgfornament{86}`
`\pgfornament{88}`

Table 677: pgfornament Decorative Borders (Traditional Chinese Motifs)



`\pgfornament{1}` `\pgfornament{42}`
`\pgfornament{2}` `\pgfornament{43}`
`\pgfornament{3}` `\pgfornament{44}`
`\pgfornament{4}` `\pgfornament{45}`
`\pgfornament{5}` `\pgfornament{46}`
`\pgfornament{6}` `\pgfornament{47}`
`\pgfornament{7}` `\pgfornament{48}`
`\pgfornament{8}` `\pgfornament{49}`
`\pgfornament{9}` `\pgfornament{50}`
`\pgfornament{10}` `\pgfornament{51}`
`\pgfornament{11}` `\pgfornament{52}`

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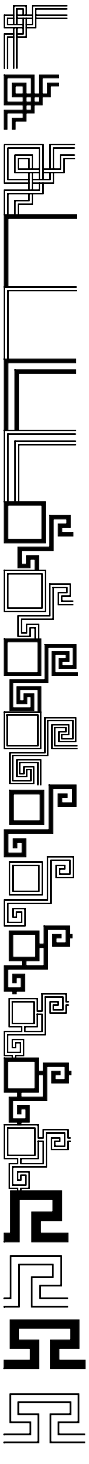

\pgfornament{12}
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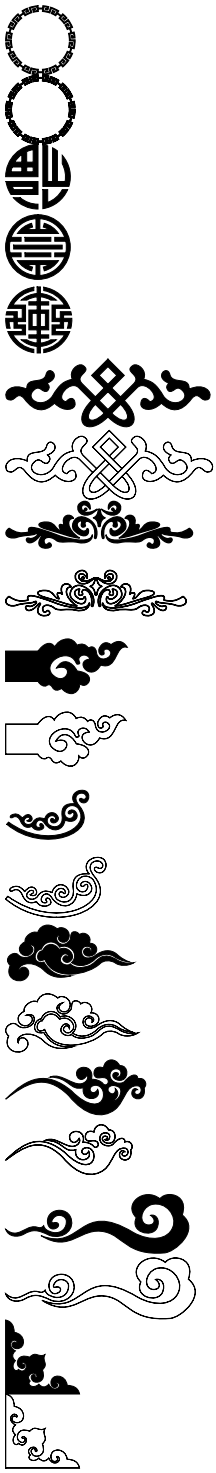
\pgfornament{33}
\pgfornament{34}
\pgfornament{35}
\pgfornament{36}



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\pgfornament{67}
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\pgfornament{72}
\pgfornament{73}

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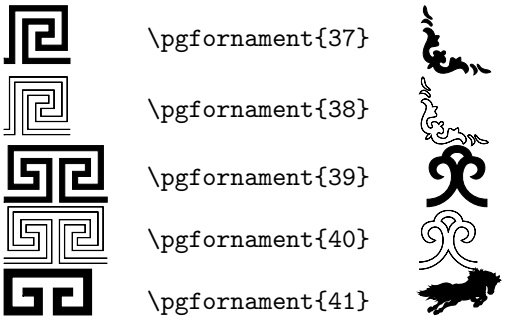
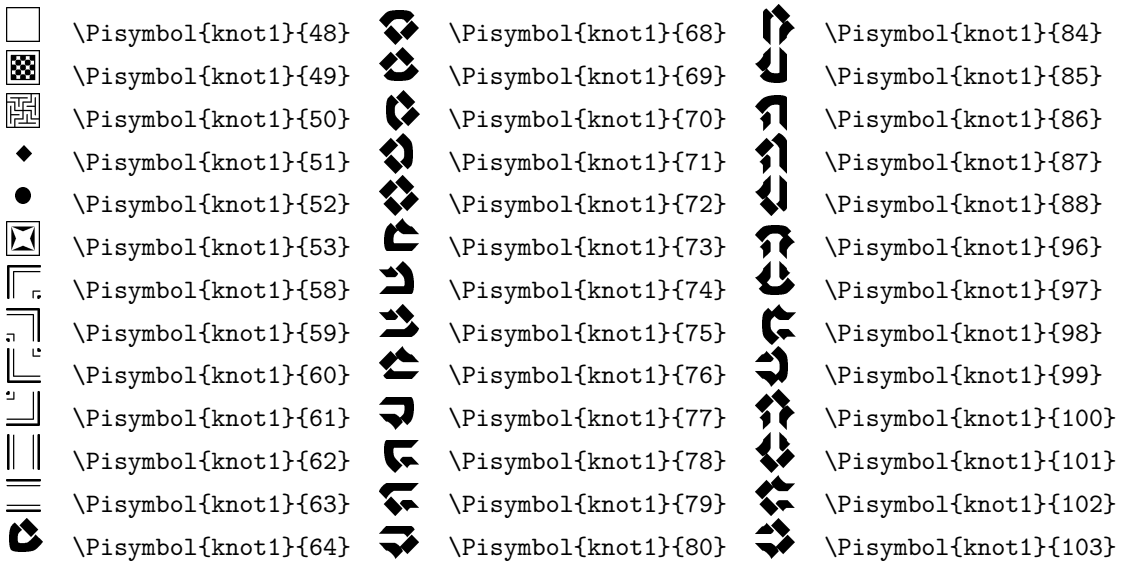


\pgfornament{37}		\pgfornament{74}	
\pgfornament{38}		\pgfornament{75}	
\pgfornament{39}		\pgfornament{76}	
\pgfornament{40}		\pgfornament{77}	
\pgfornament{41}		\pgfornament{78}	

The symbols in this table are selected with `\newpgfornamentfamily{han}`. All pgfornament symbols are implemented with Ti*k*Z graphics, not with a font. The `\pgfornament` command supports resizing, coloring, and rotating symbols. See the pgfornament documentation for more information.

Not shown in the table due to their width are `\pgfornament{29}`, `\pgfornament{30}`, `\pgfornament{31}`, and `\pgfornament{32}`. These represent various horizontal rules (thick, double thin, double thick, and triple thin, respectively).

Table 678: knot Celtic Knots



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\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}
\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}

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\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}
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\Pisymbol{knot3}{63}	\Pisymbol{knot3}{79}	\Pisymbol{knot3}{102}
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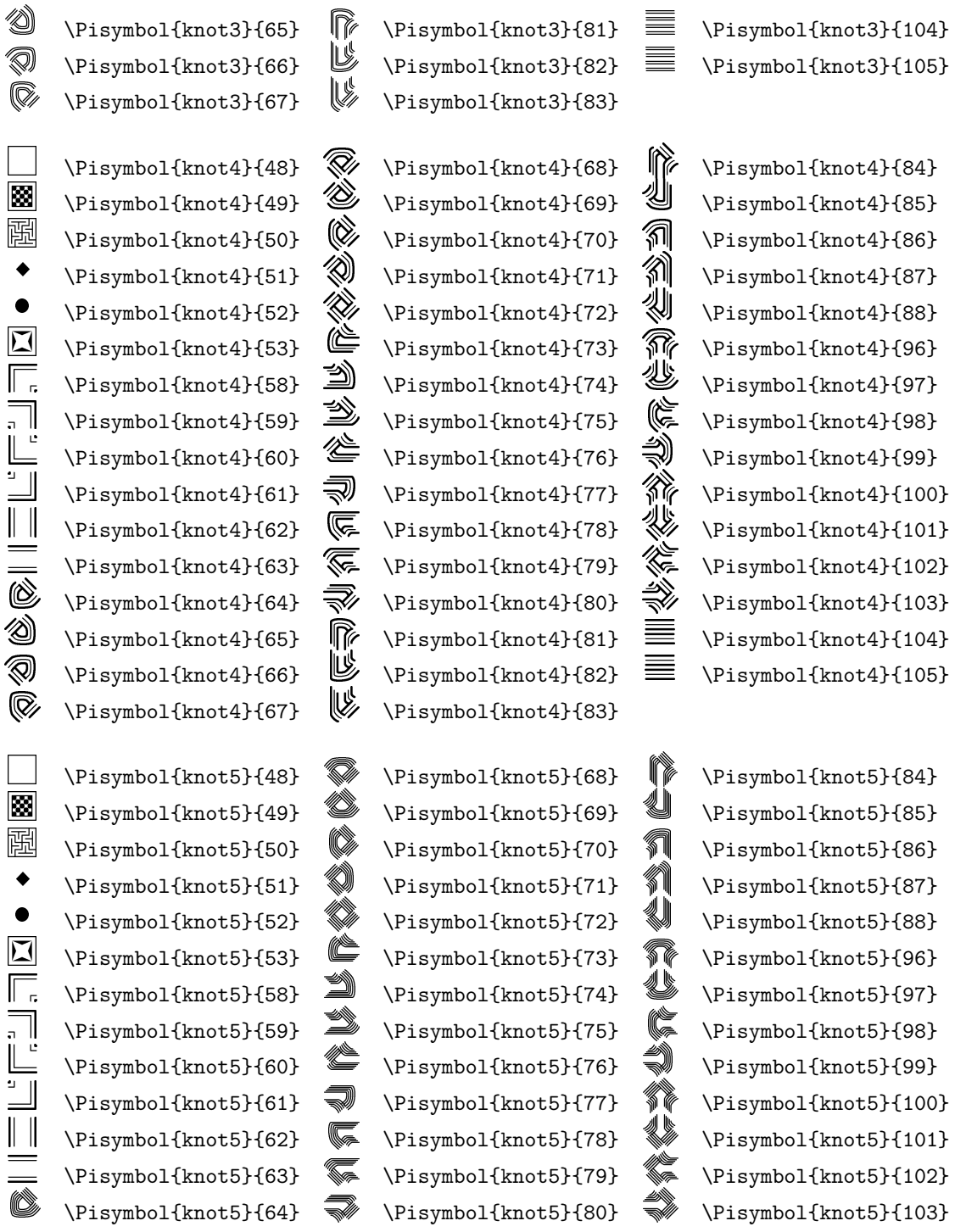

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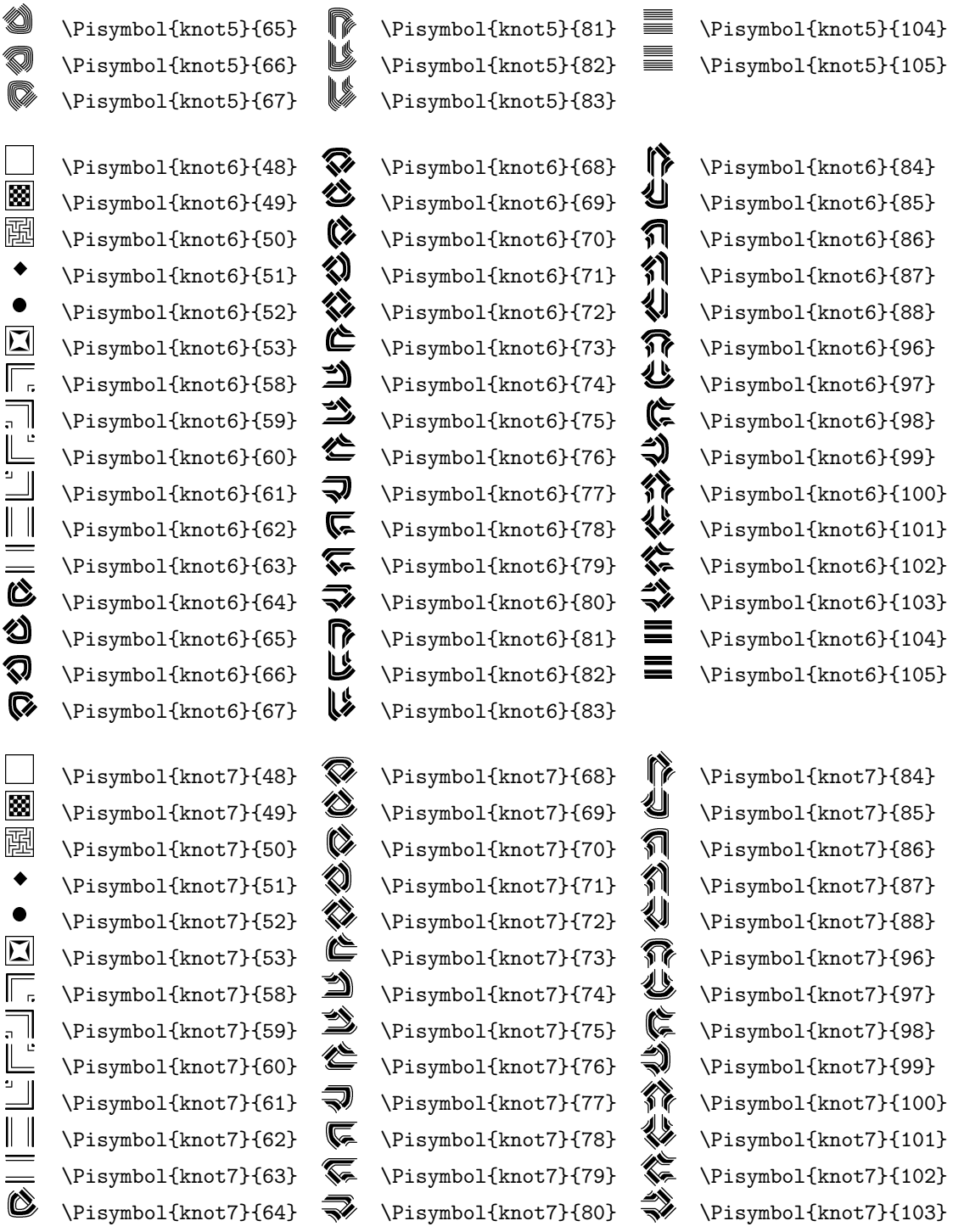

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\Pisymbol{knot7}{98}
\Pisymbol{knot7}{99}
\Pisymbol{knot7}{100}
\Pisymbol{knot7}{101}
\Pisymbol{knot7}{102}
\Pisymbol{knot7}{103}

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\Pisymbol{knot7}{65}	\Pisymbol{knot7}{81}	\Pisymbol{knot7}{104}
\Pisymbol{knot7}{66}	\Pisymbol{knot7}{82}	\Pisymbol{knot7}{105}
\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 @EA							

The niceframe package can be used to typeset decorative frames using fonts such as knot, especially using characters 48–63 of each font variant.

Table 679: dancers Dancing Men

\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}

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\Pisymbol{dancers}{12}
\Pisymbol{dancers}{13}
\Pisymbol{dancers}{14}
\Pisymbol{dancers}{15}
\Pisymbol{dancers}{16}
\Pisymbol{dancers}{17}
\Pisymbol{dancers}{18}
\Pisymbol{dancers}{19}
\Pisymbol{dancers}{20}
\Pisymbol{dancers}{21}
\Pisymbol{dancers}{22}
\Pisymbol{dancers}{23}
\Pisymbol{dancers}{24}
\Pisymbol{dancers}{25}
\Pisymbol{dancers}{26}
\Pisymbol{dancers}{27}
\Pisymbol{dancers}{28}
\Pisymbol{dancers}{29}
\Pisymbol{dancers}{30}
\Pisymbol{dancers}{31}
\Pisymbol{dancers}{32}
\Pisymbol{dancers}{33}
\Pisymbol{dancers}{34}
\Pisymbol{dancers}{35}
\Pisymbol{dancers}{36}
\Pisymbol{dancers}{37}
\Pisymbol{dancers}{38}
\Pisymbol{dancers}{39}
\Pisymbol{dancers}{40}
\Pisymbol{dancers}{41}
\Pisymbol{dancers}{98}
\Pisymbol{dancers}{99}
\Pisymbol{dancers}{100}
\Pisymbol{dancers}{101}
\Pisymbol{dancers}{102}
\Pisymbol{dancers}{103}
\Pisymbol{dancers}{104}
\Pisymbol{dancers}{105}
\Pisymbol{dancers}{106}
\Pisymbol{dancers}{107}
\Pisymbol{dancers}{108}
\Pisymbol{dancers}{109}
\Pisymbol{dancers}{110}
\Pisymbol{dancers}{111}
\Pisymbol{dancers}{112}
\Pisymbol{dancers}{113}
\Pisymbol{dancers}{114}
\Pisymbol{dancers}{115}
\Pisymbol{dancers}{116}
\Pisymbol{dancers}{117}
\Pisymbol{dancers}{118}
\Pisymbol{dancers}{119}
\Pisymbol{dancers}{120}
\Pisymbol{dancers}{121}
\Pisymbol{dancers}{122}
\Pisymbol{dancers}{123}
\Pisymbol{dancers}{124}
\Pisymbol{dancers}{125}
\Pisymbol{dancers}{126}
\Pisymbol{dancers}{127}
\Pisymbol{dancers}{184}
\Pisymbol{dancers}{185}
\Pisymbol{dancers}{186}
\Pisymbol{dancers}{187}
\Pisymbol{dancers}{188}
\Pisymbol{dancers}{189}
\Pisymbol{dancers}{190}
\Pisymbol{dancers}{191}
\Pisymbol{dancers}{192}
\Pisymbol{dancers}{193}
\Pisymbol{dancers}{194}
\Pisymbol{dancers}{195}
\Pisymbol{dancers}{196}
\Pisymbol{dancers}{197}
\Pisymbol{dancers}{198}
\Pisymbol{dancers}{199}
\Pisymbol{dancers}{200}
\Pisymbol{dancers}{201}
\Pisymbol{dancers}{202}
\Pisymbol{dancers}{203}
\Pisymbol{dancers}{204}
\Pisymbol{dancers}{205}
\Pisymbol{dancers}{206}
\Pisymbol{dancers}{207}
\Pisymbol{dancers}{208}
\Pisymbol{dancers}{209}
\Pisymbol{dancers}{210}
\Pisymbol{dancers}{211}
\Pisymbol{dancers}{212}
\Pisymbol{dancers}{213}

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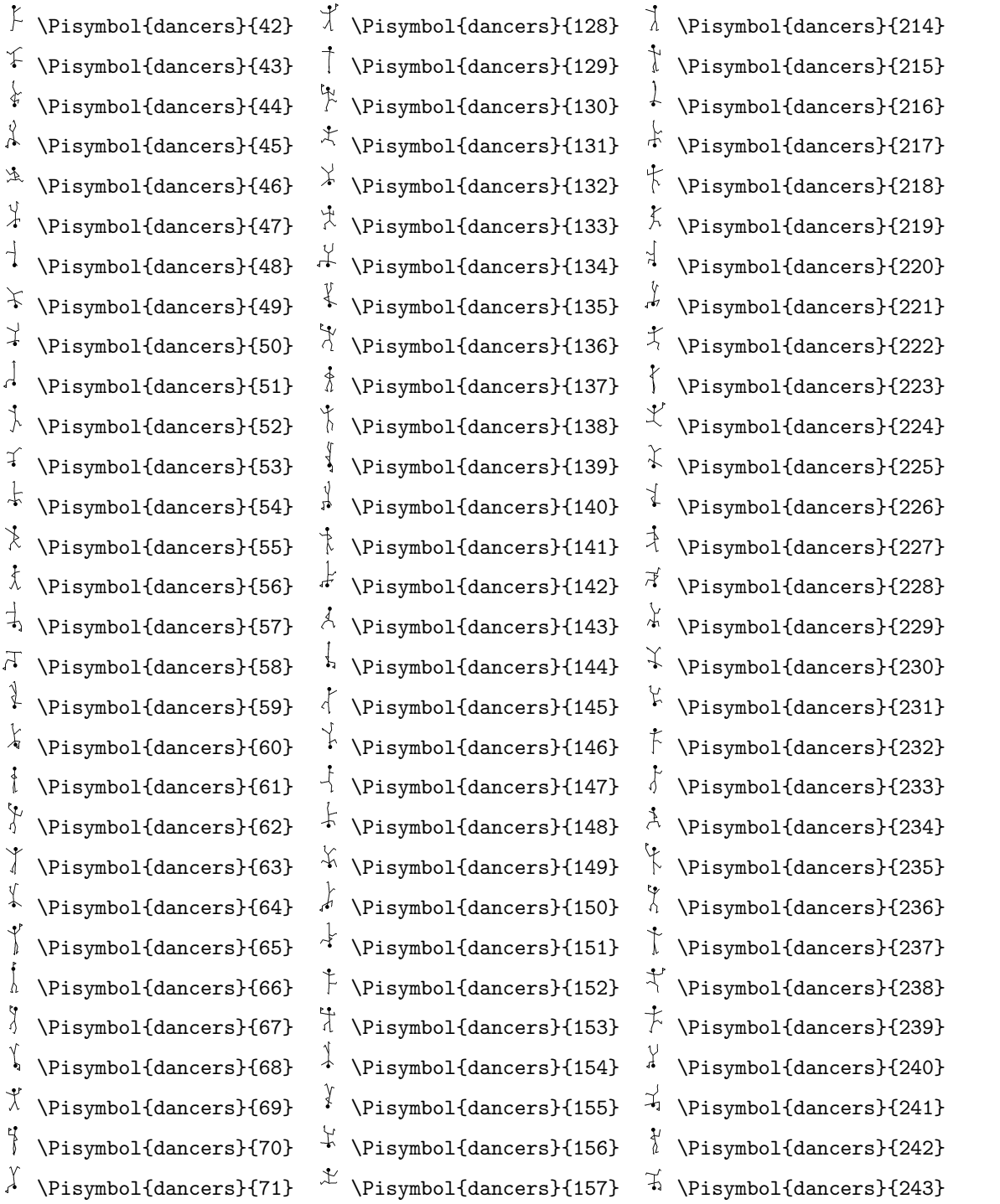

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\Pisymbol{dancers}{72}	\Pisymbol{dancers}{158}	\Pisymbol{dancers}{244}
\Pisymbol{dancers}{73}	\Pisymbol{dancers}{159}	\Pisymbol{dancers}{245}
\Pisymbol{dancers}{74}	\Pisymbol{dancers}{160}	\Pisymbol{dancers}{246}
\Pisymbol{dancers}{75}	\Pisymbol{dancers}{161}	\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}
\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 680: 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}

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⁋⁋⁋	\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}
⁋	\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}

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\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":

(person) vs. (pillar) vs. (empty)

Table 681: lcircuit Logic Gates and VLSI Symbols

\usebox{\ande}		\usebox{\nfete}		\usebox{\ots}	
\usebox{\andn}		\usebox{\nfetn}		\usebox{\otw}	
\usebox{\ands}		\usebox{\nfets}		\usebox{\pfete}	
\usebox{\andw}		\usebox{\nfetw}		\usebox{\pfetn}	
\usebox{\capew}		\usebox{\nore}		\usebox{\pfets}	
\usebox{\capns}		\usebox{\norn}		\usebox{\pfetw}	
\usebox{\exore}		\usebox{\nors}		\usebox{\resew}	
\usebox{\exorn}		\usebox{\norw}		\usebox{\resns}	
\usebox{\exors}		\usebox{\note}		\usebox{\tgateew}	
\usebox{\exorw}		\usebox{\notn}		\usebox{\tgatens}	
\usebox{\nande}		\usebox{\nots}		\usebox{\tje}	
\usebox{\nandn}		\usebox{\notw}		\usebox{\tjn}	
\usebox{\nands}		\usebox{\ore}		\usebox{\tjs}	

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	`\usebox{\nandw}`		`\usebox{\orn}`		`\usebox{\tjw}`
	`\usebox{\nexore}`		`\usebox{\ors}`		`\usebox{\vddpin}`
	`\usebox{\nexorn}`		`\usebox{\orw}`		`\usebox{\vsspin}`
	`\usebox{\nexors}`		`\usebox{\ote}`		
	`\usebox{\nexorw}`		`\usebox{\otn}`		

Each of these symbols first must be defined via an `\input` of the corresponding `.mac` file. For example, before a document can invoke `\usebox{\nande}` it first must `\input{nande.mac}`.

All lcircuit symbols are defined using a LaTeX `picture` environment, not a font.

Table 682: 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}`

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	\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 683: 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 684: figbas Figured-Bass Ligatures

2+	\Pisymbol{figbas}{50}	6̸	\Pisymbol{figbas}{54}
4+	\Pisymbol{figbas}{52}	9̸	\Pisymbol{figbas}{57}
5̸	\Pisymbol{figbas}{53}		

Shown here are the figured-bass ligatures based on Computer Modern. figbas additionally provides versions of these symbols based on Computer Modern Sans and Palatino/Palladio.

`{\usefont{U}{figbas}{m}{n}2 4 5 6 9}` is an equivalent means of producing these symbols.

Table 685: magic Trading Card Symbols

⓪	`\Pisymbol{magic}{48}`	⑥	`\Pisymbol{magic}{54}`	◕	`\Pisymbol{magic}{82}`
①	`\Pisymbol{magic}{49}`	⑦	`\Pisymbol{magic}{55}`	⛏	`\Pisymbol{magic}{84}`
②	`\Pisymbol{magic}{50}`	⑧	`\Pisymbol{magic}{56}`	●	`\Pisymbol{magic}{85}`
③	`\Pisymbol{magic}{51}`	⑨	`\Pisymbol{magic}{57}`	◎	`\Pisymbol{magic}{87}`
④	`\Pisymbol{magic}{52}`	☠	`\Pisymbol{magic}{66}`	Ⓧ	`\Pisymbol{magic}{88}`
⑤	`\Pisymbol{magic}{53}`	♣	`\Pisymbol{magic}{71}`	⑩	`\Pisymbol{magic}{90}`

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
☠	B	Black magic symbol
♣	G	Green magic symbol
◕	R	Red magic symbol
⛏	T	Tap symbol (tilted "T" in a circle)
●	U	Blue magic symbol
◎	W	White magic symbol
Ⓧ	X	Circled "X" (for mana cost, e.g., Fireball)
⑩	Z	Circled "10" (for mana cost, e.g., Aladdin's Lamp)

Table 686: bartel-chess-fonts Chess Pieces and Chessboard Squares

♙	`\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}`

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\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}
\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}{157}
\Pisymbol{fselch}{38}	\Pisymbol{fselch}{93}	\Pisymbol{fselch}{163}
\Pisymbol{fselch}{39}	\Pisymbol{fselch}{94}	\Pisymbol{fselch}{169}
\Pisymbol{fselch}{40}	\Pisymbol{fselch}{95}	\Pisymbol{fselch}{175}
\Pisymbol{fselch}{41}	\Pisymbol{fselch}{96}	\Pisymbol{fselch}{180}
\Pisymbol{fselch}{42}	\Pisymbol{fselch}{97}	\Pisymbol{fselch}{186}
\Pisymbol{fselch}{43}	\Pisymbol{fselch}{98}	\Pisymbol{fselch}{192}
\Pisymbol{fselch}{44}	\Pisymbol{fselch}{99}	\Pisymbol{fselch}{198}
\Pisymbol{fselch}{45}	\Pisymbol{fselch}{100}	\Pisymbol{fselch}{204}
\Pisymbol{fselch}{46}	\Pisymbol{fselch}{101}	\Pisymbol{fselch}{210}
\Pisymbol{fselch}{47}	\Pisymbol{fselch}{102}	\Pisymbol{fselch}{216}
\Pisymbol{fselch}{48}	\Pisymbol{fselch}{103}	\Pisymbol{fselch}{222}
\Pisymbol{fselch}{49}	\Pisymbol{fselch}{104}	\Pisymbol{fselch}{228}
\Pisymbol{fselch}{50}	\Pisymbol{fselch}{105}	\Pisymbol{fselch}{234}
\Pisymbol{fselch}{51}	\Pisymbol{fselch}{106}	\Pisymbol{fselch}{240}
\Pisymbol{fselch}{52}	\Pisymbol{fselch}{107}	\Pisymbol{fselch}{246}

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`\Pisymbol{fselch}{53}`

`\Pisymbol{fselch}{54}`

`\Pisymbol{fselch}{108}`

`\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 "LaTeX 2_ε Font Selection" [LaT19] for advice on how to expose these sorts of fonts to LaTeX using `\DeclareFontFamily` and `\DeclareFontShape`.

Chapter 12

Additional Information

Unlike the previous chapters of this document, Chapter 12 does not contain new symbol tables. Rather, it provides additional help in using the Comprehensive LaTeX 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 LaTeX. And finally, it lists some statistics about this document itself.

12.1 Symbol Name Clashes

Unfortunately, a number of symbol names are not unique; they appear in more than one package. Depending on how the symbols are defined in each package, LaTeX will either output an error message or replace an earlier-defined symbol with a later-defined symbol. Table 687 on page 365 presents a selection of name clashes that appear in this document.

Using multiple symbols with the same name in the same document—or even merely loading conflicting symbol packages—can be tricky but, as evidenced by the existence of Table 687, not impossible. The general procedure is to load the first package, rename the conflicting symbols, and then load the second package. Examine the LaTeX 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 $\mathcal{AMS}$ symbol sets, and LaTeX 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 687 because they are designed to be compatible with the symbols they replace. Table 688 on page 366 illustrates what "compatible" means in this context.

To use the new txfonts/pxfonts symbols without altering the document's main font, merely reset the default font families back to their original values after loading one of those packages:

```
\renewcommand\rmdefault{cmr}
\renewcommand\sfdefault{cmss}
\renewcommand\ttdefault{cmtt}
```

Table 687: Symbol Name Clashes

Symbol	LaTeX 2ε	AMS	stmaryrd	wasysym	mathabx	marvosym	bbding	ifsym	dingbat	wsuipa
\baro			⏀							⊖
\bigtriangledown	▽		▽							
\bigtriangleup	△		△							
\checkmark		✓							✓	
\Circle				○				○		
\Cross						+	✚	×		
\ggg		⋙			⋙					
\Letter						⊠		⊠		
\lightning			↯	↯		↯		↯		
\Lightning										
\lll		⋘			⋘					
\Square				□			□	□		
\Sun					⊙	⊙		☼		
\TriangleDown							▶	▷		
\TriangleUp							◀	◁		

Table 688: Example of a Benign Name Clash

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

12.2 Resizing symbols

Mathematical symbols listed in this document as "variable-sized" are designed to stretch vertically. Each variable-sized symbol comes in one or more basic sizes plus a variation comprising both stretchable and nonstretchable segments. Table 689 on page 366 presents the symbols `\}` and `\uparrow` in their default size, in their `\big`, `\Big`, `\bigg`, and `\Bigg` sizes, in an even larger size achieved using `\left`/`\right`, and—for contrast—in a large size achieved by changing the font size using LaTeX 2ε'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.

Table 689: Sample resized delimiters

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

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 TeX backend and will produce jagged symbols when scaling a bitmapped font.

All variable-sized delimiters are defined (by the corresponding `.tfm` file) in terms of up to five segments, as illustrated by Figure 12.1 on the following page. The top, middle, and bottom segments are of a fixed size.

The top-middle and middle-bottom segments (which are constrained to be the same character) are repeated as many times as necessary to achieve the desired height.

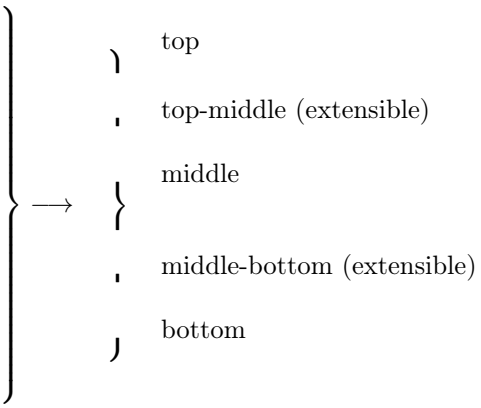


Figure 12.1: Implementation of variable-sized delimiters

12.3 Where can I find the symbol for . . . ?

If you can't find some symbol you're looking for in this document, there are a few possible explanations:

- The symbol isn't intuitively named. As a few examples, the ifsym command to draw dice is "`\Cube`"; a plus sign with a circle around it ("exclusive or" to computer engineers) is "`\oplus`"; and lightning bolts in fonts designed by German speakers may have "blitz" in their names as in the ulsy package. The moral of the story is to be creative with synonyms when searching the index.
- The symbol is defined by some package that I overlooked (or deemed unimportant). If there's some symbol package that you think should be included in the Comprehensive LaTeX 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 LaTeX binding for it. For example, the PostScript Symbol font contains a "↵" symbol, which may be useful for representing a carriage return, but there is no package (as far as I know) for accessing that symbol. To produce an unnamed symbol, you need to switch to the font explicitly with LaTeX 2_ε's low-level font commands [LaT19] and use TeX'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 ("ſ") using character 115 from the Latin Modern fonts in the TS1 font encoding:[1]

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

Then, "`\textlongs ucce\textlongs sful`" will produce "fuccefsful"—in the current font style (roman, italic, bold, etc.)

In fact, `\char` is not strictly necesssary in all cases; the character can often be entered symbolically. For example, the symbol for an impulse train or Tate-Shafarevich group ("Ш") is actually an uppercase *sha* in

[1] Since January 2020, the wasysym package provides a `\longs` symbol. See Table 48.

the Cyrillic alphabet. (Cyrillic is supported by the OT2 font encoding, for instance). While a *sha* can be defined numerically as "`{\fontencoding{OT2}\selectfont\char88}`" it may be more intuitive to use the OT2 font encoding's "SH" ligature: "`{\fontencoding{OT2}\selectfont SH}`". Another possibility is to use the T2A font encoding's `\CYRSH` command: "`{\fontencoding{T2A}\selectfont\CYRSH}`".

For the specific case of the U font encoding, which is used for symbol or "pi" fonts, the pifont package defines a convenient `\Pisymbol` command. `\Pisymbol` typesets a specified character (by number) in a specified font family. For example, "`\Pisymbol{psy}{191}`" produces the aforementioned "↵" symbol by typesetting character number 191 in the `psy` (PostScript Symbol) font family.

12.3.1 Reflecting and rotating existing symbols

A common request on `comp.text.tex` is for a reversed or rotated version of an existing symbol. As a last resort, these effects can be achieved with the graphicx (or graphics) package's `\reflectbox` and `\rotatebox` macros. For example, `\textsuperscript{\reflectbox{?}}` produces an irony mark ("ʕ"), and `\rotatebox[origin=c]{180}{$\iota$}` 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 ("⊐") and whole ("⊇") relations used in Dedekind's set notation:

```
\newcommand\partof{\mathrel{\raisebox{0.45ex}{$\mathfrak{3}$}}}
\newcommand\wholeof{\mathrel{\reflectbox{$\partof$}}}
```

The disadvantage of the graphicx/graphics approach is that not every TEX backend handles graphical transformations.[2] 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` ("ɜ") or wsuipa's `\revepsilon` ("ɜ") may be used to express the mathematical notion of "such that" in a cleaner manner than with `\reflectbox` or `\rotatebox`.[3]

12.3.2 Joining and overlapping existing symbols

Symbols that do not exist in any font can sometimes be fabricated out of existing symbols. The LATEX 2ε source file `fontdef.dtx` contains a number of such definitions. For example, `\models` (see Table 98 on page 67) is defined in that file with:

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

where `\mathrel` and `\joinrel` are used to control the horizontal spacing. `\def` is the TEX primitive upon which LATEX's `\newcommand` is based. See The TEXbook [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, LATEX defines `\hbar` ("ħ") as a "⁻" character (`\mathchar'26`) followed by a backspace of 9 math units (`\mkern-9mu`), followed by the letter "*h*":

```
\def\hbar{{\mathchar'26\mkern-9muh}}
```

[2] As an example, Xdvi ignores both `\reflectbox` and `\rotatebox`.

[3] More common symbols for representing "such that" include "`|`", "`:`", and "`s.t.`".

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 −9 mu kern would have produced the less-attractive "$\bar{d}$" glyph.

The amsmath package provides `\overset` and `\underset` commands for placing one symbol respectively above or below another. For example, `\overset{G}{\sim}`[4] 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` ("⁂") from a June 2007 post to `comp.text.tex` by Peter Flynn:

```
\newcommand{\asterism}{\smash{%
   \raisebox{-.5ex}{%
     \setlength{\tabcolsep}{-.5pt}%
     \begin{tabular}{@{}cc@{}}%
       \multicolumn2c*\\[-2ex]*&*%
     \end{tabular}}}}
```

Note how the space between columns (`\tabcolsep`) and rows (`\\[...]`) is made negative to squeeze the asterisks closer together.

There is a TEX primitive called `\mathaccent` that centers one mathematical symbol atop another. For example, one can define `\dotcup` ("⊍")—the composition of a `\cup` and a `\cdot`—as follows:

```
\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 LATEX but takes a list of vertical material instead of `\\`-separated rows. Also, it vertically centers the result on the math axis. (Many operators, such as "+" and "−" are also vertically centered on the math axis.) Enrico Gregorio posted the following symbol definition to `comp.text.tex` in March 2004 in response to a query about an alternate way to denote equivalence:

```
\newcommand*{\threesim}{%
  \mathrel{\vcenter{\offinterlineskip
  \hbox{$\sim$}\vskip-.35ex\hbox{$\sim$}\vskip-.35ex\hbox{$\sim$}}}}
```

The `\threesim` symbol, which vertically centers three `\sim` ("∼") symbols with 0.35 x-heights of space between them, is rendered as "≋". `\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: $a \div b \mathrel{\threesim} c \times d$.

A related LATEX command, borrowed from Plain TEX, is `\ooalign`. `\ooalign` vertically overlaps symbols and works both within and outside of math mode. Essentially, it creates a single-column `tabular` environment with zero vertical distance between rows. However, because it is based directly on TEX's `\ialign`

[4] LATEX's `\stackrel` command is similar but is limited to placing a symbol above a binary relation.

primitive, `\ooalign` uses TEX's tabular syntax instead of LATEX's (i.e., with `\cr` as the row terminator instead of `\\`). The following example of `\ooalign`, a macro that defines a standard-state symbol (`\stst`, "$^{\ominus}$") as a superscripted Plimsoll line (`\barcirc`, "$\ominus$"),[5] is due to an October 2007 `comp.text.tex` post by Donald Arseneau:

```
\makeatletter
\providecommand\barcirc{\mathpalette\@barred\circ}
\def\@barred#1#2{\ooalign{\hfil$#1-$\hfil\cr\hfil$#1#2$\hfil\cr}}
\newcommand\stst{^{\protect\barcirc}}
\makeatother
```

In the preceding code, note the `\ooalign` call's use of `\hfil` to horizontally center a minus sign ("−") and a `\circ` ("∘").

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` ("∋") and two minus signs ("−") to produce "∋", an obscure variation on the infrequently used "϶" symbol for "such that"discussed on page 368:

```
\newcommand{\suchthat}{%
  \mathrel{\ooalign{$\ni$\cr\kern-1pt$-$\kern-6.5pt$-$}}}
```

The slashed package, although originally designed for producing Feynman slashed-character notation, in fact facilitates the production of *arbitrary* overlapped symbols. The default behavior is to overwrite a given character with "/". For example, `\slashed{D}` produces "$\not{D}$". However, the `\declareslashed` command provides the flexibility to specify the mathematical context of the composite character (operator, relation, punctuation, etc., as will be discussed in Section 12.4), the overlapping symbol, horizontal and vertical adjustments in symbol-relative units, and the character to be overlapped. Consider, for example, the symbol for reduced quadrupole moment ("$\not{I}$"). This can be declared as follows:

```
\newcommand{\rqm}{{%
  \declareslashed{}{\text{-}}{0.04}{0}{I}\slashed{I}}}
```

`\declareslashed{·}{·}{·}{·}{I}` affects the meaning of all subsequent `\slashed{I}` commands in the same scope. The preceding definition of `\rqm` therefore uses an extra set of curly braces to limit that scope to a single `\slashed{I}`. In addition, `\rqm` uses amstext's `\text` macro (described on page 372) to make `\declareslashed` use a text-mode hyphen ("-") instead of a math-mode minus sign ("−") and to ensure that the hyphen scales properly in size in subscripts and superscripts. See slashed's documentation (located in `slashed.sty` itself) for a detailed usage description of the `\slashed` and `\declareslashed` commands.

Somewhat simpler than slashed is the centernot package. centernot provides a single command, `\centernot`, which, like `\not`, puts a slash over the subsequent mathematical symbol. However, instead of putting the slash at a fixed location, `\centernot` centers the slash over its argument. `\centernot` might be used, for example, to create a "does not imply" symbol:

$\not\Longrightarrow$ `\not\Longrightarrow`

vs.

$\centernot\Longrightarrow$ `\centernot\Longrightarrow`

See the centernot documentation for more information.

[5] While `\barcirc` illustrates how to combine symbols using `\ooalign`, the plimsoll package's `\plimsoll` command (Table 353 on page 165) and the stmaryrd package's `\minuso` command (Table 55 on page 38) provide a similar glyph ($\ominus$) as a single, indivisible symbol.

12.3.3 Making new symbols work in superscripts and subscripts

To make composite symbols work properly within subscripts and superscripts, you may need to use TEX's `\mathchoice` primitive. `\mathchoice` evaluates one of four expressions, based on whether the current math style is display, text, script, or scriptscript. (See The 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 "⊥" symbol out of `\top` and `\bot` ("⊤" and "⊥"):

```
\def\topbotatom#1{\hbox{\hbox to 0pt{$#1\bot$\hss}$#1\top$}}
\newcommand*{\topbot}{\mathrel{\mathchoice{\topbotatom\displaystyle}
                                  {\topbotatom\textstyle}
                                  {\topbotatom\scriptstyle}
                                  {\topbotatom\scriptscriptstyle}}}
```

The following is another example that uses `\mathchoice` to construct symbols in different math modes. The code defines a principal value integral symbol, which is an integral sign with a line through it.

```
\def\Xint#1{\mathchoice
   {\XXint\displaystyle\textstyle{#1}}%
   {\XXint\textstyle\scriptstyle{#1}}%
   {\XXint\scriptstyle\scriptscriptstyle{#1}}%
   {\XXint\scriptscriptstyle\scriptscriptstyle{#1}}%
   \!\int}
\def\XXint#1#2#3{{\setbox0=\hbox{$#1{#2#3}{\int}$}
     \vcenter{\hbox{$#2#3$}}\kern-.5\wd0}}
\def\ddashint{\Xint=}
\def\dashint{\Xint-}
```

(The preceding code was taken verbatim from `http://www.texfaq.org/FAQ-prinvalint.html`.) `\dashint` produces a single-dashed integral sign ("⨍"), while `\ddashint` produces a double-dashed one ("⨎"). The `\Xint` macro defined above can also be used to generate a wealth of new integrals: "∲" (`\Xint\circlearrowright`), "∳" (`\Xint\circlearrowleft`), "⫰" (`\Xint\subset`), "⨜" (`\Xint\infty`), and so forth.

LATEX 2ε 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 ("⫫") to `comp.text.tex` in June 2000:

```
\newcommand\independent{\protect\mathpalette{\protect\independenT}{\perp}}
\def\independenT#1#2{\mathrel{\rlap{$#1#2$}\mkern2mu{#1#2}}}
```

The `\independent` macro uses `\mathpalette` to pass the `\independenT` helper macro both the current math style and the `\perp` symbol. `\independenT` typesets `\perp` in the current math style, moves two math units to the right, and finally typesets a second—overlapping—copy of `\perp`, again in the current math style. `\rlap`, which enables text overlap, is described on page 372.

Some people like their square-root signs with a trailing "hook" (i.e., "$\sqrt{\ }$") as this helps visually distinguish expressions like "$\sqrt{3x}$" from those like "$\sqrt{3}x$". In March 2002, Dan Luecking posted a `\mathpalette`-based definition of a hooked square-root symbol to `comp.text.tex`. This code was subsequently refined by Max Dohse and Scott Pakin into the version shown below, which accepts a root as an optional argument, for consistency with `\sqrt`.

```
\newcommand{\hksqrt}[2][]{\mathpalette\DHLhksqrt{[#1]{#2\,}}}
\def\DHLhksqrt#1#2{\setbox0=\hbox{$#1\sqrt#2$}\dimen0=\ht0
  \advance\dimen0-0.2\ht0
  \setbox2=\hbox{\vrule height\ht0 depth -\dimen0}%
  {\box0\lower0.4pt\box2}}
```

Notice how `\hksqrt` uses `\mathpalette` to pass the current math style (`\displaystyle`, `\textstyle`, etc.) to `\DHLhksqrt` as argument `#1`. `\DHLhksqrt` subsequently uses that style within an `\hbox`. The rest of the code is simply using TEX primitives to position a hook of height 0.2 times the `\sqrt` height at the right of the `\sqrt`. See The TEXbook [Knu86a] for more understanding of TEX "boxes" and "dimens".

Sometimes, however, amstext's `\text` macro is all that is necessary to make composite symbols appear correctly in subscripts and superscripts, as in the following definitions of `\neswarrow` ("↙") and `\nwsearrow` ("↖↘"):[6]

```
\newcommand{\neswarrow}{\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 "AB". However, the result of the former is the width of "A", and the result of the latter is the width of "B"—`\llap{...}` and `\rlap{...}` take up zero space.

In a June 2002 post to `comp.text.tex`, Donald Arseneau presented a general macro for aligning an arbitrary number of symbols on their horizontal centers and vertical baselines:

```
\makeatletter
  \def\moverlay{\mathpalette\mov@rlay}
  \def\mov@rlay#1#2{\leavevmode\vtop{%
     \baselineskip\z@skip \lineskiplimit-\maxdimen
     \ialign{\hfil$#1##$\hfil\cr#2\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 `\\`). For example, the `\topbot` command defined above could have been expressed as "`\moverlay{\top\cr\bot}`" and the `\neswarrow` command defined above could have been expressed as "`\moverlay{\nearrow\cr\swarrow}`".

The basic concept behind `\moverlay`'s implementation is that `\moverlay` typesets the given symbols in a table that utilizes a zero `\baselineskip`. This causes every row to be typeset at the same vertical position. See The TEXbook [Knu86a] for explanations of the TEX primitives used by `\moverlay`.

Steven B. Segletes answered a question on TEX Stack Exchange, "AMS inequalities: a variant of `\gtrsim` and `\lesssim`" on typesetting `\gtrsim` ("≳") and `\lesssim` ("≲") with the `\sim` symbol slanted to match the angle of the greater-than/less-than sign. His solution incorporates the graphicx package's `\rotatebox` for rotating the "∼", the stackengine package's `\stackengine` command for stacking two symbols on top of each other, and the scalerel package's `\ThisStyle`, `\SavedStyle`, and `\LMex` commands for scaling the symbol based on the surrounding context. The following code due to Segletes defines the `\gtrsimslant` ("⪴") and `\lesssimslant` ("⪳") symbols:[7]

[6] Note that if your goal is to typeset commutative diagrams or pushout/pullback diagrams, then you should probably be using XY-pic.

[7] The code as posted on TEX Stack Exchange named these `\vargtrsim` and `\varlesssim`. They are renamed here for naming consistency with symbols such as `\geqslant` ("⩾").

```
\newcommand\lesssimslant{\mathrel{\ensurestackMath{\ThisStyle{%
  \stackengine{-.4\LMex}{\SavedStyle<}{%
    \rotatebox{-25}{$\SavedStyle\sim$}}{U}{r}{F}{T}{S}}}}}
\newcommand\gtrsimslant{\mathrel{\ensurestackMath{\ThisStyle{%
  \stackengine{-.4\LMex}{\SavedStyle>}{%
    \rotatebox{25}{$\SavedStyle\sim$}}{U}{l}{F}{T}{S}}}}}
```

12.3.4 Modifying LaTeX-generated symbols

Oftentimes, symbols composed in the LaTeX 2_ε source code can be modified with minimal effort to produce useful variations. For example, `fontdef.dtx` composes the `\ddots` symbol (see Table 306 on page 151) out of three periods, raised 7 pt., 4 pt., and 1 pt., respectively:

```
\def\ddots{\mathinner{\mkern1mu\raise7\p@
    \vbox{\kern7\p@\hbox{.}}\mkern2mu
    \raise4\p@\hbox{.}\mkern2mu\raise\p@\hbox{.}\mkern1mu}}
```

`\p@` is a LaTeX 2_ε shortcut for "`pt`" or "`1.0pt`". The remaining commands are defined in The TeXbook [Knu86a]. To draw a version of `\ddots` with the dots going along the opposite diagonal, we merely have to reorder the `\raise7\p@`, `\raise4\p@`, and `\raise\p@`:

```
\makeatletter
  \def\revddots{\mathinner{\mkern1mu\raise\p@
    \vbox{\kern7\p@\hbox{.}}\mkern2mu
    \raise4\p@\hbox{.}\mkern2mu\raise7\p@\hbox{.}\mkern1mu}}
\makeatother
```

`\revddots` is essentially identical to the mathdots package's `\iddots` command or the yhmath package's `\adots` command.

12.3.5 Encircling symbols

A simple, special case of combining existing symbols is to overlay a circle atop a given symbol. LaTeX's built-in `\textcircled` (Table 19 on page 26) does exactly that: `\textcircled{A}` produces "Ⓐ". The circledsteps package enhances this capability by using Ti*k*Z to draw circles—rather, ovals—that extend to fit their content, that can be colored, and that can align either the original symbol or the circled symbol on the baseline. As a simple example, `f\Circled{ghi}j` produces "f(ghi)j", in contrast with `f\textcircled{ghi}j`, which produces "fⓖⓗⓘj".

12.3.6 Producing complex accents

Accents are another special case of combining existing symbols to make new symbols. While various tables in this document show how to add an accent to an existing symbol, some applications, such as transliterations from non-Latin alphabets, require *multiple* accents per character. For instance, the creator of pdfTeX writes his name as "Hàn Thế Thành". The dblaccnt package enables LaTeX to stack accents, as in "`H\‘an Th\’{\^e} Th\‘anh`" (albeit not in the OT1 font encoding). In addition, the wsuipa package defines `\diatop` and `\diaunder` macros for putting one or more diacritics or accents above or below a given character. For example, `\diaunder[{\diatop[\’|\=]}|\textsubdot{r}]` produces "r̈́". See the wsuipa documentation for more information.

The accents package facilitates the fabrication of accents in math mode. Its `\accentset` command enables *any* character to be used as an accent. For instance, `\accentset{\star}{f}` produces "$\overset{\star}{f}$" and `\accentset{e}{X}` produces "$\overset{e}{X}$". `\underaccent` does the same thing, but places the accent beneath the

character. This enables constructs like `\underaccent{\tilde}{V}`, which produces "$\underset{\sim}{V}$". accents provides other accent-related features as well; see the documentation for more information.

12.3.7 Creating extensible symbols

A relatively simple example of creating extensible symbols stems from a `comp.text.tex` post by Donald Arseneau (June 2003). The following code defines an equals sign that extends as far to the right as possible, just like LaTeX's `\hrulefill` command:

```
\makeatletter
\def\equalsfill{$\m@th\mathord=\mkern-7mu
  \cleaders\hbox{$\!\mathord=\!$}\hfill
  \mkern-7mu\mathord=$}
\makeatother
```

TeX'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 LaTeX's `\stackrel` command, which stacks one mathematical expression (slightly reduced in size) atop another. Hence, "`\stackrel{a}{\rightarrow}`" produces "$\stackrel{a}{\rightarrow}$" and "X `\stackrel{\text{definition}}{\hbox{\equalsfill}}` Y" produces "$X \stackrel{\text{definition}}{=\!=\!=\!=\!=\!=\!=} Y$".

If all that needs to extend are horizontal and vertical lines—as opposed to repeated symbols such as the "=" in the previous example—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 287). For a more complete solution for typesetting actuarial symbols see the actuarialsymbol package.

A more complex example of composing accents is the following definition of extensible `\overbracket`, `\underbracket`, `\overparenthesis`, and `\underparenthesis` symbols, taken from a May 2002 `comp.text.tex` post by Donald Arseneau:

```
\makeatletter
\def\overbracket#1{\mathop{\vbox{\ialign{##\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{$\m@th\braceld\leaders\vrule\hfill\bracerd$}
\def\upparenthfill{$\m@th\bracelu\leaders\vrule\hfill\braceru$}
\def\upbracketfill{$\m@th\makesm@sh{\llap{\vrule\@height3\p@\@width.7\p@}}%
  \leaders\vrule\@height.7\p@\hfill
  \makesm@sh{\rlap{\vrule\@height3\p@\@width.7\p@}}$}
\def\downbracketfill{$\m@th
  \makesm@sh{\llap{\vrule\@height.7\p@\@depth2.3\p@\@width.7\p@}}%
  \leaders\vrule\@height.7\p@\hfill
  \makesm@sh{\rlap{\vrule\@height.7\p@\@depth2.3\p@\@width.7\p@}}$}
\makeatother
```

Table 690 showcases these accents. The TEXbook [Knu86a] or another book on TEX primitives is indispensible 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., `\braceld` [“⎛”] for `\downparenthfill`), a horizontal rule that stretches as wide as possible, and a right symbol (e.g., `\bracerd` [“⎞”] for `\downparenthfill`). `\overbracket`, `\underbracket`, `\overparenthesis`, and `\underparenthesis` merely create a table whose width is determined by the given text, thereby constraining the width of the horizontal rules.

Table 690: Manually Composed Extensible Accents

$\overbracket{abc}$	`\overbracket{abc}`	$\overparenthesis{abc}$	`\overparenthesis{abc}`
$\underbracket{abc}$	`\underbracket{abc}`	$\underparenthesis{abc}$	`\underparenthesis{abc}`

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

$$\underbracket{\overbracket{A\overbracket{BC}D}}$$.

See the simplewick documentation for more information.

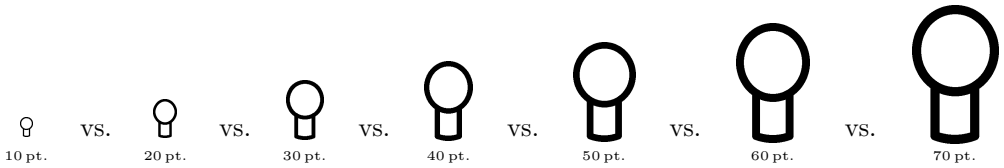
12.3.8 Developing new symbols from scratch

Sometimes is it simply not possible to define a new symbol in terms of existing symbols. Fortunately, most, if not all, TEX distributions are shipped with a tool called METAFONT which is designed specifically for creating fonts to be used with TEX. The METAFONTbook [Knu86b] is the authoritative text on METAFONT. If you plan to design your own symbols with METAFONT, The METAFONTbook is essential reading. You may also want to read the freely available METAFONT primer located at `http://metafont.tutorial.free.fr/`. The following is an extremely brief tutorial on how to create a new LATEX symbol using METAFONT. Its primary purpose is to cover the LATEX-specific operations not mentioned in The METAFONTbook and to demonstrate that symbol-font creation is not necessarily a difficult task.

Suppose we need a symbol to represent a light bulb (“💡”).[8] The first step is to draw this in METAFONT.

[8] I’m not a very good artist; you’ll have to pretend that “💡” looks like a light bulb.

It is common to separate the font into two files: a size-dependent file, which specifies the design size and various font-specific parameters that are a function of the design size; and a size-independent file, which draws characters in the given size. Figure 12.2 shows the METAFONT code for `lightbulb10.mf`. `lightbulb10.mf` specifies various parameters that produce a 10 pt. light bulb then loads `lightbulb.mf`. Ideally, one should produce `lightbulb`⟨*size*⟩`.mf` files for a variety of ⟨*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:




```
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 12.2: Sample METAFONT size-specific file (`lightbulb10.mf`)

`lightbulb.mf`, shown in Figure 12.3, draws a light bulb using the parameters defined in `lightbulb10.mf`. Note that the the filenames "`lightbulb10.mf`" and "`lightbulb.mf`" do not follow the Berry font-naming scheme [Ber01]; the Berry font-naming scheme is largely irrelevant for symbol fonts, which generally lack bold, italic, small-caps, slanted, and other such variants.

The code in Figures Figure 12.2 and Figure 12.3 is heavily commented and should demonstrate some of the basic concepts behind METAFONT usage: declaring variables, defining points, drawing lines and curves, and preparing to debug or fine-tune the output. Again, The METAFONTbook [Knu86b] is the definitive reference on METAFONT programming.

METAFONT can produce "proofs" of fonts—large, labeled versions that showcase the logical structure of each character. In fact, proof mode is METAFONT's default mode. To produce a proof of `lightbulb10.mf`, issue the following commands at the operating-system prompt:

```
prompt> mf lightbulb10.mf                    ⇐ Produces lightbulb10.2602gf
prompt> gftodvi lightbulb10.2602gf           ⇐ Produces lightbulb10.dvi
```

You can then view `lightbulb10.dvi` with any DVI viewer. The result is shown in Figure 12.4. Observe how the grid defined with *makegrid* at the bottom of Figure 12.3 draws vertical lines at positions 0, *sb*, $w/2$, and $w - sb$ and horizontal lines at positions 0, $-1pt$, y_2, and h. Similarly, observe how the *penlabels* command labels all of the important coordinates: $z_1, z_2, \ldots, z_8$ and z_{67}, which `lightbulb.mf` defines to lie between z_6 and z_7.

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
```

```
mode_setup;                                          % Target a given printer.

define_pixels(em, cap, sb);                          % Convert to device-specific units.
define_corrected_pixels(o);                          % Same, but add a device-specific fudge factor.

%% Define a light bulb at the character position for "A"
%% with width 1/2em#, height cap#, and depth 1pt#.
beginchar("A", 1/2em#, cap#, 1pt#); "A light bulb";
    pickup pencircle scaled 1/2pt;                   % Use a pen with a small, circular tip.

    %% Define the points we need.
    top z1 = (w/2, h + o);                           % z1 is at the top of a circle.
    rt z2 = (w + sb + o - x4, y4);                   % z2 is at the same height as z4 but the opposite side.
    bot z3 = (z1 - (0, w - sb - o));                 % z3 is at the bottom of the circle.
    lft z4 = (sb - o, 1/2[y1, y3]);                  % z4 is on the left of the circle.
    path bulb;                                       % Define a path for the bulb itself.
    bulb = z1 .. z2 .. z3 .. z4 .. cycle;            % The bulb is a closed path.

    z5 = point 2 - 1/3 of bulb;                      % z5 lies on the bulb, a little to the right of z3.
    z6 = (x5, 0);                                    % z6 is at the bottom, directly under z5.
    z7 = (x8, 0);                                    % z7 is at the bottom, directly under z8.
    z8 = point 2 + 1/3 of bulb;                      % z8 lies on the bulb, a little to the left of z3.
    bot z67 = (1/2[x6, x7], pen_bot - o - 1/8pt);    % z67 lies halfway between z6 and z7 but a jot
lower.

    %% Draw the bulb and the base.
    draw bulb;                                       % Draw the bulb proper.
    draw z5 -- z6 .. z67 .. z7 -- z8;                % Draw the base of the bulb.

    %% Display key positions and points to help us debug.
    makegrid(0, sb, w/2, w - sb)(0, -1pt, y2, h);    % Label "interesting" x and y coordinates.
    penlabels(1, 2, 3, 4, 5, 6, 67, 7, 8);           % Label control points for debugging.
endchar;
end
```

Figure 12.3: Sample METAFONT size-independent file (`lightbulb.mf`)

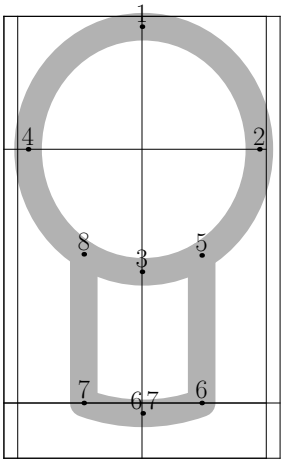


Figure 12.4: Proof diagram of `lightbulb10.mf`

```
This is TeX, Version 3.14159 (Web2C 7.3.1)
(/usr/share/texmf/tex/plain/base/testfont.tex
Name of the font to test = lightbulb10
Now type a test command (\help for help):)
*\table

*\bye
[1]
Output written on testfont.dvi (1 page, 1516 bytes).
Transcript written on testfont.log.
```

The resulting table, stored in `testfont.dvi` and illustrated in Figure 12.5, shows every character in the font. To understand how to read the table, note that the character code for "A"—the only character defined by `lightbulb10.mf`—is 41 in hexadecimal (base 16) and 101 in octal (base 8).

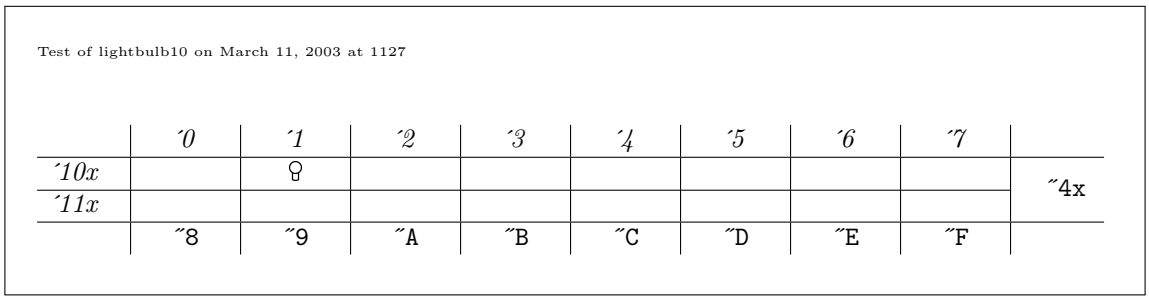


Figure 12.5: Font table produced by `testfont.tex`

The LightBulb10 font is now usable by TEX. LATEX 2_ε, however, needs more information before documents can use the font. First, we create a font-description file that tells LATEX 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 is important; it must be of the form "⟨*encoding*⟩⟨*family*⟩`.fd`", where ⟨*encoding*⟩ is the lowercase version of the encoding name (typically "u" for symbol fonts) and ⟨*family*⟩ is the name of the font family. For LightBulb10, let's call this "bulb". Figure 12.6 lists the contents of `ubulb.fd`. The document "LATEX 2_ε Font Selection" [LAT19] describes `\DeclareFontFamily` and `\DeclareFontShape` in detail, but the gist of `ubulb.fd` is first to declare a `U`-encoded version of the `bulb` font family and then to specify that a LATEX 2_ε 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 12.6: LATEX 2_ε font-description file (`ubulb.fd`)

The final step is to write a LATEX 2_ε style file that defines a name for each symbol in the font. Because we have only one symbol our style file, `lightbulb.sty` (Figure 12.7), is rather trivial. Note that instead of typesetting "`A`" we could have had `\lightbulb` typeset "`\char65`", "`\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 12.7: LaTeX 2_ε 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.texfaq.org/FAQ-textrace.html` for pointers to tools that can produce Type 1 fonts from METAFONT.

12.4 Math-mode spacing

Terms such as "binary operators", "relations", and "punctuation" in Chapter 3 primarily regard the surrounding spacing. (See the Short Math Guide for 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 "`$A \mathbin{\dot{\cup}} B$`" ("$A \mathbin{\dot\cup} B$"). See The TeXbook [Knu86a] for the definitive description of math-mode spacing.

The purpose of the "log-like symbols" in Table 203 and Table 204 is to provide the correct amount of spacing around and within multiletter function names. Table 691 on page 379 contrasts the output of the log-like symbols with various, naïve alternatives. In addition to spacing, the log-like symbols also handle subscripts properly. For example, "`\max_{p \in P}`" produces "$\max_{p\in P}$" in text, but "$\max\limits_{p\in P}$" as part of a displayed formula.

Table 691: Spacing Around/Within Log-like Symbols

LaTeX expression	Output	
`$r \sin \theta$`	$r \sin \theta$	(best)
`$r sin \theta$`	$rsin\theta$	
`$r \mbox{sin} \theta$`	$r\mathrm{sin}\theta$	
`$r \mathrm{sin} \theta$`	$r\mathrm{sin}\theta$	

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 692 contrasts symbols declared with `\DeclareMathOperator` and `\DeclareMathOperator*` in both text style (`$...$`) and display style (`\[...\]`).[9]

Table 692: Defining new log-like symbols

Declaration function	`$\newlogsym_{p \in P}$`	`\[ \newlogsym_{p \in P} \]`
`\DeclareMathOperator`	$\operatorname{newlogsym}_{p\in P}$	$\operatorname{newlogsym}_{p\in P}$
`\DeclareMathOperator*`	$\operatorname{newlogsym}_{p\in P}$	$\operatorname*{newlogsym}_{p\in P}$

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 204 utilize this spacing convention.

12.5 Bold mathematical symbols

LaTeX does not normally use bold symbols when typesetting mathematics. However, bold symbols are occasionally needed, for example when naming vectors. Any of the approaches described at `http://www.texfaq.org/FAQ-boldgreek.html` can be used to produce bold mathematical symbols. Table 693 contrasts the output produced by these various techniques. As the table illustrates, these techniques exhibit variation in their formatting of Latin letters (upright vs. italic), formatting of Greek letters (bold vs. normal), formatting of operators and relations (bold vs. normal), and spacing. xfakebold's `\setBold` command is unique in that it takes a thickness argument and supports arbitrary symbol thickness, although it works only with vector fonts, not bitmapped fonts.

Table 693: Producing bold mathematical symbols

Package	Code	Output	
none	`$\alpha + b = \Gamma \div D$`	$\alpha + b = \Gamma \div D$	(no bold)
none	`$\mathbf{\alpha + b = \Gamma \div D}$`	$\mathbf{\alpha + b = \Gamma \div D}$	
none	`\boldmath$\alpha + b = \Gamma \div D$`	$\boldsymbol{\alpha + b = \Gamma \div D}$	
amsbsy	`$\pmb{\alpha + b = \Gamma \div D}$`	$\boldsymbol{\alpha + b = \Gamma \div D}$	(faked bold)
amsbsy	`$\boldsymbol{\alpha + b = \Gamma \div D}$`	$\boldsymbol{\alpha + b = \Gamma \div D}$	
bm	`$\bm{\alpha + b = \Gamma \div D}$`	$\boldsymbol{\alpha + b = \Gamma \div D}$	
fixmath	`$\mathbold{\alpha + b = \Gamma \div D}$`	$\boldsymbol{\alpha + b = \Gamma \div D}$	

xfakebold	`\setBold[0.3]`
	`  $\alpha + b = \Gamma \div D$`
	`\unsetBold`
		$\boldsymbol{\alpha + b = \Gamma \div D}$	(faked bold)

12.6 ASCII and Latin 1 quick reference

Table 694 on page 381 amalgamates data from various other tables in this document into a convenient reference for LaTeX 2_ε typesetting of ASCII characters, i.e., the characters available on a typical U.S. computer

[9] Note that `\displaystyle` can be used to force display style within `$...$` and `\textstyle` can be used to force text style within `\[...\]`.

keyboard. The first two columns list the character's ASCII code in decimal and hexadecimal. The third column shows what the character looks like. The fourth column lists the LaTeX 2_ε command to typeset the character as a text character. And the fourth column lists the LaTeX 2_ε command to typeset the character within a `\texttt{...}` command (or, more generally, when `\ttfamily` is in effect).

Table 694: LaTeX 2_ε ASCII Table

Dec	Hex	Char	Body text	\texttt	Dec	Hex	Char	Body text	\texttt
33	21	!	!	!	62	3E	>	\textgreater	>
34	22	"	\textquotedbl	"	63	3F	?	?	?
35	23	#	\#	\#	64	40	@	@	@
36	24	$	\$	\$	65	41	A	A	A
37	25	%	\%	\%	66	42	B	B	B
38	26	&	\&	\&	67	43	C	C	C
39	27	’	’	’	⋮	⋮	⋮	⋮	⋮
40	28	(	(	(	90	5A	Z	Z	Z
41	29	)	)	)	91	5B	[	[	[
42	2A	*	*	*	92	5C	\	\textbackslash	\char‘\\
43	2B	+	+	+	93	5D	]	]	]
44	2C	,	,	,	94	5E	^	\textasciicircum	\textasciicircum
45	2D	-	-	-	95	5F	_	_	\char‘_
46	2E	.	.	.	96	60	‘	‘	‘
47	2F	/	/	/	97	61	a	a	a
48	30	0	0	0	98	62	b	b	b
49	31	1	1	1	99	63	c	c	c
50	32	2	2	2	⋮	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮	122	7A	z	z	z
57	39	9	9	9	123	7B	{	\{	\char‘\{
58	3A	:	:	:	124	7C	|	\textbar	|
59	3B	;	;	;	125	7D	}	\}	\char‘\}
60	3C	<	\textless	<	126	7E	~	\textasciitilde	\textasciitilde
61	3D	=	=	=					

The following are some additional notes about the contents of Table 694:

- “"” is not available in the OT1 font encoding.
- Table 694 shows a close quote for character 39 for consistency with the open quote shown for character 96. A straight quote can be typeset using `\textquotesingle` (cf. Table 47).
- The characters “<”, “>”, and “|” do work as expected in math mode, although they produce, respectively, “¡”, “¿”, and “—” in text mode when using the OT1 font encoding.[10] The following are some alternatives for typesetting “<”, “>”, and “|”:
  - Specify a document font encoding other than OT1 (as described on page 16).
  - Use the appropriate symbol commands from Table 2 on page 19, viz. `\textless`, `\textgreater`, and `\textbar`.

[10] Donald Knuth didn't think such symbols were important outside of mathematics so he omitted them from his text fonts.

  - Enter the symbols in math mode instead of text mode, i.e., `$<$`, `$>$`, and `$|$`.

  Note that for typesetting metavariables many people prefer `\textlangle` and `\textrangle` to `\textless` and `\textgreater`; i.e., "⟨*filename*⟩" instead of "<*filename*>".

- Although "`/`" does not require any special treatment, LaTeX additionally defines a `\slash` command which outputs the same glyph but permits a line break afterwards. That is, "`increase/decrease`" is always typeset as a single entity while "`increase\slash{}decrease`" may be typeset with "increase/" on one line and "decrease" on the next.

- `\textasciicircum` can be used instead of `\^{}`, and `\textasciitilde` can be used instead of `\~{}`. Note that `\textasciitilde` and `\~{}` produce raised, diacritic tildes. "Text" (i.e., vertically centered) tildes can be generated with either the math-mode `\sim` command (shown in Table 98 on page 67), which produces a somewhat wide "∼", or the textcomp package's `\texttildelow` (shown in Table 47 on page 34), which produces a vertically centered "~" in most fonts but a baseline-oriented "~" in Computer Modern, txfonts, pxfonts, and various other fonts originating from the TeX world. If your goal is to typeset tildes in URLs or Unix filenames, your best bet is to use the url package, which has a number of nice features such as proper line-breaking of such names.

- The various `\char` commands within `\texttt` are necessary only in the OT1 font encoding. In other encodings (e.g., T1), commands such as `\{`, `\}`, `\_`, and `\textbackslash` all work properly.

- The code page 437 (IBM PC) version of ASCII characters 1 to 31 can be typeset using the ascii package. See Table 368 on page 170.

- To replace "‘" and "’" with the more computer-like (and more visibly distinct) "`" and "'" within a `verbatim` environment, use the upquote package. Outside of `verbatim`, you can use `\char18` and `\char13` to get the modified quote characters. (The former is actually a grave accent.)

Similar to Table 694, Table 695 on the following page is an amalgamation of data from other tables in this document. While Table 694 shows how to typeset the 7-bit ASCII character set, Table 695 shows the Latin 1 (Western European) character set, also known as ISO-8859-1.

The following are some additional notes about the contents of Table 695:

- A "(tc)" after a symbol name means that the textcomp package must be loaded to access that symbol. A "(T1)" means that the symbol requires the T1 font encoding. The fontenc package can change the font encoding document-wide.

- Many of the `\text...` accents can also be produced using the accent commands shown in Table 19 on page 26 plus an empty argument. For instance, `\={}` is essentially the same as `\textasciimacron`.

- The commands in the "LaTeX 2ε" columns work both in body text and within a `\texttt{...}` 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 LaTeX'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 16) or use the textcomp package, which redefines `\pounds` to use the TS1 font encoding.

- Character 173, `\-`, is shown as "-" but is actually a discretionary hyphen; it appears only at the end of a line.

Table 695: LaTeX 2_ε Latin 1 Table

Dec	Hex	Char	LaTeX 2_ε	
161	A1	¡	!‘	
162	A2	¢	\textcent	(tc)
163	A3	£	\pounds	
164	A4	¤	\textcurrency	(tc)
165	A5	¥	\textyen	(tc)
166	A6	¦	\textbrokenbar	(tc)
167	A7	§	\S	
168	A8	¨	\textasciidieresis	(tc)
169	A9	©	\textcopyright	
170	AA	ª	\textordfeminine	
171	AB	«	\guillemetleft	(T1)
172	AC	¬	\textlnot	(tc)
173	AD	-	\-	
174	AE	®	\textregistered	
175	AF	¯	\textasciimacron	(tc)
176	B0	°	\textdegree	(tc)
177	B1	±	\textpm	(tc)
178	B2	²	\texttwosuperior	(tc)
179	B3	³	\textthreesuperior	(tc)
180	B4	´	\textasciiacute	(tc)
181	B5	µ	\textmu	(tc)
182	B6	¶	\P	
183	B7	·	\textperiodcentered	
184	B8	¸	\c{}	
185	B9	¹	\textonesuperior	(tc)
186	BA	º	\textordmasculine	
187	BB	»	\guillemetright	(T1)
188	BC	¼	\textonequarter	(tc)
189	BD	½	\textonehalf	(tc)
190	BE	¾	\textthreequarters	(tc)
191	BF	¿	?‘	
192	C0	À	\‘{A}	
193	C1	Á	\’{A}	
194	C2	Â	\^{A}	
195	C3	Ã	\~{A}	
196	C4	Ä	\"{A}	
197	C5	Å	\AA	
198	C6	Æ	\AE	
199	C7	Ç	\c{C}	
200	C8	È	\‘{E}	
201	C9	É	\’{E}	
202	CA	Ê	\^{E}	
203	CB	Ë	\"{E}	
204	CC	Ì	\‘{I}	
205	CD	Í	\’{I}	
206	CE	Î	\^{I}	
207	CF	Ï	\"{I}	
208	D0	Ð	\DH	(T1)

Dec	Hex	Char	LaTeX 2_ε	
209	D1	Ñ	\~{N}	
210	D2	Ò	\‘{O}	
211	D3	Ó	\’{O}	
212	D4	Ô	\^{O}	
213	D5	Õ	\~{O}	
214	D6	Ö	\"{O}	
215	D7	×	\texttimes	(tc)
216	D8	Ø	\O	
217	D9	Ù	\‘{U}	
218	DA	Ú	\’{U}	
219	DB	Û	\^{U}	
220	DC	Ü	\"{U}	
221	DD	Ý	\’{Y}	
222	DE	Þ	\TH	(T1)
223	DF	ß	\ss	
224	E0	à	\‘{a}	
225	E1	á	\’{a}	
226	E2	â	\^{a}	
227	E3	ã	\~{a}	
228	E4	ä	\"{a}	
229	E5	å	\aa	
230	E6	æ	\ae	
231	E7	ç	\c{c}	
232	E8	è	\‘{e}	
233	E9	é	\’{e}	
234	EA	ê	\^{e}	
235	EB	ë	\"{e}	
236	EC	ì	\‘{ı}	
237	ED	í	\’{ı}	
238	EE	î	\^{ı}	
239	EF	ï	\"{ı}	
240	F0	ð	\dh	(T1)
241	F1	ñ	\~{n}	
242	F2	ò	\‘{o}	
243	F3	ó	\’{o}	
244	F4	ô	\^{o}	
245	F5	õ	\~{o}	
246	F6	ö	\"{o}	
247	F7	÷	\textdiv	(tc)
248	F8	ø	\o	
249	F9	ù	\‘{u}	
250	FA	ú	\’{u}	
251	FB	û	\^{u}	
252	FC	ü	\"{u}	
253	FD	ý	\’{y}	
254	FE	þ	\th	(T1)
255	FF	ÿ	\"{y}	

Table 696: LaTeX 2ε Code Page 1252 Table

Dec	Hex	Char	LaTeX 2ε		Dec	Hex	Char	LaTeX 2ε	
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	ˆ	\^{}		152	98	˜	\~{}	
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	Ÿ	\"{Y}	

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 696 presents the characters with which CP1252 augments the standard Latin 1 table.

The following are some additional notes about the contents of Table 696:

- As in Table 695, a “(tc)” after a symbol name means that the textcomp package must be loaded to access that symbol. A “(T1)” means that the symbol requires the T1 font encoding. The fontenc package can change the font encoding document-wide.
- Not all characters in the 128–159 range are defined.
- Look up “euro signs” in the index for alternatives to `\texteuro`.

While too large to incorporate into this document, a listing of ISO 8879:1986 SGML/XML character entities and their LaTeX equivalents is available from `http://www.bitjungle.com/isoent/`. Some of the characters presented there make use of isoent, a LaTeX 2ε package (available from the same URL) that fakes some of the missing ISO glyphs using the LaTeX `picture` environment.[11]

12.7 Unicode characters

Unicode is a “universal character set”—a standard for encoding (i.e., assigning unique numbers to) the symbols appearing in many of the world’s languages. While ASCII can represent 128 symbols and Latin 1 can represent 256 symbols, Unicode can represent an astonishing 1,114,112 symbols.

Because TeX and LaTeX predate the Unicode standard and Unicode fonts by almost a decade, support for Unicode has had to be added to the base TeX and LaTeX systems. Note first that LaTeX 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.

[11] isoent is not featured in this document, because it is not available from CTAN and because the faked symbols are not “true” characters; they exist in only one size, regardless of the body text’s font size.

12.7.1 Inputting Unicode characters

To include Unicode characters in a `.tex` file, load the ucs package and load the inputenc package with the utf8x ("UTF-8 extended") option.[12] These packages enable LaTeX to translate UTF-8 sequences to LaTeX commands, which are subsequently processed as normal. For example, the UTF-8 text "`Copyright ©
2024`"—"©" is not an ASCII character and therefore cannot be input directly without packages such as ucs/inputenc—is converted internally by inputenc to "`Copyright \textcopyright{} 2024`" and therefore typeset as "Copyright © 2024".

The ucs/inputenc combination supports only a tiny subset of Unicode's million-plus symbols. Additional symbols can be added manually using the `\DeclareUnicodeCharacter` command. `\DeclareUnicodeCharacter` takes two arguments: a Unicode number and a LaTeX command to execute when the corresponding Unicode character is encountered in the input. For example, the Unicode character "degree celsius" ("℃") appears at character position U+2103.[13] 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℃.
\end{document}
```

which produces

> It was a balmy 21℃.

See the ucs documentation for more information and for descriptions of the various options that control ucs's behavior.

12.7.2 Outputting Unicode characters

Orthogonal to the ability to include Unicode characters in a LaTeX input file is the ability to include a given Unicode character in the corresponding output file. By far the easiest approach is to use LuaLaTeX or XeLaTeX instead of pdfLaTeX or ordinary LaTeX. LuaLaTeX and XeLaTeX handle Unicode input and output natively and can utilize system fonts directly without having to expose them via `.tfm`, `.fd`, and other such files. To output a Unicode character, a LuaLaTeX or XeLaTeX document can either include that character directly as UTF-8 text or use TeX's `\char` primitive, which LuaLaTeX/XeLaTeX extends to accept numbers larger than 255.

Suppose we want to output the symbols for versicle ("℣") and response ("℟") in a document. The Unicode charts list "versicle" at position U+2123 and "response" at position U+211F. We therefore need to install a font that contains those characters at their proper positions. One such font that is freely available from CTAN is Junicode (`Junicode.ttf`) from the junicode package. The fontspec package makes it easy for a LuaLaTeX/XeLaTeX document to utilize a system font. The following example defines a `\textjuni` command that uses fontspec to typeset its argument in Junicode:

[12] UTF-8 is the 8-bit Unicode Transformation Format, a popular mechanism for representing Unicode symbol numbers as sequences of one to four bytes.

[13] The Unicode convention is to express character positions as "U+⟨*hexadecimal number*⟩".

```
\documentclass{article}
\usepackage{fontspec}

\newcommand{\textjuni}[1]{{\fontspec{Junicode}#1}}

\begin{document}
We use ``\textjuni{\char"2123}'' for a versicle
and ``\textjuni{\char"211F}'' for a response.
\end{document}
```

which produces

> We use "℣" 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.

12.8 About this document

History David Carlisle wrote the first version of this document in October, 1994. It originally contained all of the native LaTeX symbols (Table 53, Table 79, Table 98, Table 153, Table 203, Table 208, Table 244, Table 245, Table 259, Table 270, Table 334, and a few tables that have since been reorganized) and was designed to be nearly identical to the tables in Chapter 3 of Leslie Lamport's book [Lam86]. Even the table captions and the order of the symbols within each table matched! The $\mathcal{AMS}$ symbols (Table 54, Table 99, Table 100, Table 156, Table 157, Table 209, Table 218, Table 238, and Table 335) and an initial Math Alphabets table (Table 348) were added thereafter. Later, Alexander Holt provided the stmaryrd tables (Table 55, Table 81, Table 101, Table 159, Table 199, and Table 239).

In January, 2001, Scott Pakin took responsibility for maintaining the symbol list and has since implemented a complete overhaul of the document. The result, now called, "The Comprehensive LaTeX Symbol List", includes the following new features:

- the addition of a handful of new math alphabets, dozens of new font tables, and thousands of new symbols
- the categorization of the symbol tables into body-text symbols, mathematical symbols, science and technology symbols, dingbats, ancient languages, and other symbols, to provide a more user-friendly document structure
- an index, table of contents, hyperlinks, and a frequently-requested symbol list, to help users quickly locate symbols
- symbol tables rewritten to list the symbols in alphabetical order
- appendices providing additional information relevant to using symbols in LaTeX
- tables showing how to typeset all of the characters in the ASCII and Latin 1 font encodings

Furthermore, the internal structure of the document has been completely altered from David Carlisle's original version. Most of the changes are geared towards making the document easier to extend, modify, and reformat.

Build characteristics Table 697 on page 387 lists some of this document's build characteristics. Most important is the list of packages that LaTeX couldn't find, but that `symbols.tex` otherwise would have been able to take advantage of. Complete, prebuilt versions of this document are available from CTAN via `https://www.ctan.org/pkg/comprehensive/`. Table 698 shows the package date (specified in the `.sty` file with `\ProvidesPackage`) for each package that was used to build this document and that specifies a package date. Packages are not listed in any particular order in either Table 697 or Table 698.

Table 697: Document Characteristics

Characteristic	Value
Source file:	`symbols.tex`
Build date:	January 3, 2024
Symbols documented:	20323
Packages included:	textcomp latexsym amssymb stmaryrd euscript wasysym pifont manfnt bbding undertilde ifsym tipa tipx extraipa wsuipa phonetic ulsy ar metre txfonts mathabx fclfont skak ascii dingbat skull eurosym esvect yfonts yhmath esint mathdots trsym universa upgreek overrightarrow chemarr chemarrow nath trfsigns abraces mathtools phaistos arcs vietnam t4phonet holtpolt semtrans dictsym extarrows protosem harmony hieroglf cclicenses mathdesign arev MnSymbol fdsymbol boisik cmll extpfeil keystroke fge turnstile simpsons epsdice feyn staves igo colonequals shuffle fourier dozenal pmboxdraw pigpen clock teubner linearA linearb cypriot sarabian GHA2e harpoon steinmetz milstd recycle DotArrow ushort hhcount ogonek combelow musixtex ccicons adfsymbols adforn bigints soyombo tfrupee knitting textgreek begriff frege countriesofeurope cookingsymbols prodint epiolmec mdwmath rsfso fontawesome5 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 oplotsymbl cmupint realhats euflag scsnowman endofproofwd mismath musicography rojud utfsym worldflags plimsoll twemojis sacsymb overarrows resmes pdfmsym sillypage academicons typicons figbas asapsym fontmfizz hamnosys figchild logix pgfornament lcircuit quantikz accents nicefrac xfakebold junicode mathrsfs chancery urwchancal calligra bbold mbboard dsfont bbm dsserif
Packages omitted:	*none*

Table 698: Package versions used in the preparation of this document

Name	Date	Name	Date	Name	Date
textcomp	2020-02-02	latexsym	1998-08-17	amssymb	2013-01-14
stmaryrd	1994-03-03	euscript	2009-06-22	wasysym	2020-01-19
pifont	2020-03-25	manfnt	1999-07-01	bbding	1999-04-15
undertilde	2000-08-08	ifsym	2000-04-18	tipa	2002-08-08
tipx	2003-01-01	wsuipa	1994-07-16	ar	2012-01-23
metre	2001-12-05	txfonts	2008-01-22	mathabx	2003-07-29
skak	2018-01-08	ascii	2006-05-30	dingbat	2001-04-27
skull	2002-01-23	eurosym	1998-08-06	yfonts	2019-04-04
mathdots	2014-06-11	trsym	2000-06-25	universa	2019-08-26
upgreek	2003-02-12	chemarr	2016-05-16	abraces	2022-11-06
mathtools	2022-06-29	phaistos	2004-04-23	arcs	2004-05-09
t4phonet	2004-06-01	semtrans	1998-02-10	dictsym	2004-07-26
extarrows	2020-03-12	protosem	2005-03-18	harmony	2007-05-04
hieroglf	2015-06-02	cclicenses	2005-05-20	MnSymbol	2007-01-21
fdsymbol	2011-11-01	boisik	2009-08-21	extpfeil	2009-10-31
keystroke	2010-04-23	fge	2015-05-19	turnstile	2007-06-23
epsdice	2007-02-15	feyn	2022-07-20	colonequals	2016-05-16
shuffle	2008-10-27	dozenal	2018-05-11	pmboxdraw	2019-12-05
pigpen	2008-12-07	clock	2001-04-10	teubner	2023-08-25
linearA	2006-03-13	linearb	2005-06-22	cypriot	2009-05-22
sarabian	2005-11-12	CJHJA2e	1997-06-01	harpoon	1994-11-02
steinmetz	2009-06-14	milstd	2009-06-25	DotArrow	2007-02-12
ushort	2001-06-13	hhcount	1995-03-31	ogonek	1995-07-17
combelow	2010-05-02	musixtex	2001-07-08	ccicons	2017-10-30
adforn	2019-10-13	bigints	2010-02-15	soyombo	1996-09-01
tfrupee	2010-12-15	knitting	2019-04-03	textgreek	2011-10-09
frege	2012-08-04	countriesofeurope	2018-12-29	cookingsymbols	2014-12-28
epiolmec	2003-11-05	mdwmath	1996-04-11	fontawesome5	2022-05-02
stix	2018-04-17	starfont	2010-09-29	tikzsymbols	2021-12-14
actuarialangle	2019-06-13	bclogo	2016-01-10	bullcntr	2007-04-02
rubikcube	2018-02-25	svrsymbols	2019-02-12	halloweenmath	2019-11-01
emf	2016-09-09	oplotsymbl	2017-08-04	cmupint	2020-04-13
realhats	2022-06-13	euflag	2020-05-22	scsnowman	2023-02-23
musicography	2023-09-08	rojud	2020-10-25	utfsym	2022-04-17
plimsoll	2020-10-09	twemojis	2021-04-19	sacsymb	2023-02-06
overarrows	2023-02-15	resmes	2022-12-27	sillypage	2023-03-04
academicons	2021-11-26	typicons	2015-05-20	asapsym	2016-03-20
fontmfizz	2017-03-19	hamnosys	2022-02-08	figchild	2022-03-22
logix	2022-06-22	pgfornament	2020-05-26	quantikz	2023-05-24
accents	2006-05-12	nicefrac	1998-08-04	xfakebold	2023-11-21
calligra	2012-04-10				

12.9 Copyright and license

The Comprehensive LaTeX Symbol List
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and version 1.3c or later is part of all distributions of LaTeX version 2006/05/20 or later.

This work has the LPPL maintenance status "maintained".

The current maintainer of this work is Scott Pakin.

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[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] LATEX3 Project Team. A new math accent. *LATEX News*. Issue 9, June 1998. Available from `https://www.latex-project.org/news/latex2e-news/ltnews09.pdf` and also included in many TEX distributions.

[LAT19] LATEX3 Project Team. LATEX 2_ε font selection, October 2019. Available from `http://mirrors.ctan.org/macros/latex/base/fntguide.pdf` and also included in many TEX distributions.

Index

Similar-looking glyphs are compressed into a single index entry with a superscript "+" indicating that glyph variations exist. For example, the entry "integral, contour (∮)+" presents only "∮" but indicates that variations also are available. In this case, those variations are "∮", "∮", "∮", "∮", "∮", and "∮"—essentially font differences along the lines of "A" vs. "A" vs. "𝒜". Substantially different glyphs with the same name are not merged. For example, both "×" and "∏" are presented for "product".

Accents are shown over/under a gray box (e.g., "´" for "accents, acute"). Symbols appearing in a table that spans pages sometimes are associated with all of the pages that table covers. The author hopes to correct this issue in a future version of the Comprehensive LaTeX Symbol List.

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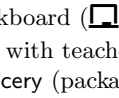 295
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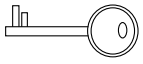
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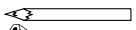 325–327
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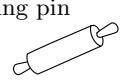 286–287
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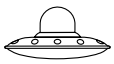
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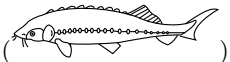
sturgeon () 264–267
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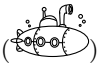
submarine () . . 325–327
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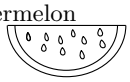 286–287
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