Symbols & Logical Syntax in \LaTeX

Lewis Britton

Greek & Hebrew Characters

Alphabetical Letters

A, α	\Alpha, \alpha	Ι, ι	\Iota, \iota	Ρ, ρ, ρ	\Rho, \rho, \varrho
B, β	\Beta, \beta	K, κ, \varkappa	\Kappa, \kappa, \varkappa	Σ , σ , ς	\Sigma, \sigma, \varsigma
Γ, γ	\Gamma, \gamma	$\Lambda,~\lambda$	\Lambda, \lambda	T, τ	\Tau, \tau
$\Delta, \ \delta$	\Delta, \delta	M, μ	\Mu, \mu	Υ , υ	\Upsilon, \upsilon
E, ϵ , ε	\Epsilon, \epsilon, \varepsilon	N, ν	\Nu, \nu	Φ, ϕ, φ	\Phi, \phi, \varphi
Z, ζ	\Zeta, \zeta	Ξ, ξ	\Xi, \xi	Χ, χ,	\Chi, \chi
H, η	\Eta, \eta	О, о	\Omicron, \omicron	Ψ, ψ	\Psi, \psi
Θ , θ , ϑ	\Theta, \theta, \vartheta	Π, π, ϖ	\Pi, \pi, \varpi	Ω, ω	\Omega, \omega

Miscellaneous Characters & Punctuation

F	\digamma	C	\complement	_	\angle	3	\Im	G	\Game
×	\aleph	ℓ	\ell	4	\measuredangle	R	∖Re	E	\Finv
コ	\beth	ð	\eth	∢	\sphericalangle	ប	\mho	∂	\partial
٦	\daleth	\hbar	\hbar	$\sqrt{}$	\surd	80	\wp	TM , ©	\trademark, \copyright
ב	\gimel	ħ	\hslash	Ц	\natural	k	\Bbbk	£, \$	\pounds, \\$
\imath	\imath	Т	\top	#	\sharp	Ø	\emptyset	\Diamond , \Diamond	\diamondsuit, \lozenge
J	\jmath	1	\bot	b	\flat	∞	∞	\Diamond	\heartsuit
∇	\nabla	§	\S	Δ	\vartriangle	□, □	\Box, \square	*	\clubsuit
\triangle	\triangle	Ø	\varnothing	▽	\triangledown	♦	\Diamond	^	\spadesuit
A	\blacktriangle		\blacksquare		\diagdown] =	\exists	*	\bigstar
•	\blacktriangledown	•	\blacklozenge	/	\diagup	∄	\nexists		

Text Mode Miscellaneous Characters & Punctuation

ó	\'{o}	ō	\b{o}	ŏ	\v o	Ø, ø	\0, \0	•	\ P	£, \$	$\pounds, \$$
ò	\'{o}	ò	\.{o}	ó	\d o	Å, å	\AA, \a	§	\S	!, ?	!,?
ö	\"{o}	ó	\d{o}	ô	\r o	Æ,æ	\AE, \ae	†	\dag	., ,	., ,
ô	\^{o}	Q	\c{o}	ő	\H o	ß	\ss	‡	\ddag	٠, ٠,	·, ·
õ	\~{o}	ŏ	\u{o}	o	\t o	1	\i	TM , ©	\trademark, \copyright	", "	", " or "
ō	\={o}	ő	\H{o}	oo	\t{oo}	1	\i	(R), (R)	\textregistered, \circledR	:, ;	:,;

Basic Math Mode

Alphabets

$XYX \ xyz$	XYZ\ xyz	XYZ xyz	$\mathbf{XYZ} \times \mathbf{xyz}$	XYZ	\mathbb{XYZ}
$XYZ \ xyz$	\mathnormal{XYZ\ xyz}	XYZ xyz	$XYZ \ xyz$	xyz	\mathcal{XYZ}
$XYZ \ xyz$	\mathit{XYZ\ xyz}	XYZ xyz	$XYZ\ xyz$	XY3	\mathfrak{XYZ}
XYZ vvz	\mathrm{XVZ\ xvz}				

${\rm Spacing}$

xyz	xyz	Default math	abad		a\!b\mspace{-3mu}c\negthinspace d	Neg. 3mu 'thin'
x y z	x\ y\ z	Expanded	dad		a\negmedspace b\mspace{-4mu}c\negmedspace d	Neg. 4mu 'medium'
$\sin x \cos y$	\sin x\cos y	Operator	død		a\negthickspace b\mspace{-5mu}c\negthickspace d	Neg. 5mu 'thick'
abcd	ab\mspace{3mu}c\thinspace d	3mu 'thin'	a	b	ab	Width of 'xxx'
$a\ b\ c\ d$	a\:b\mspace{4mu}c\medspace d	4mu 'medium'		-	- (
a h c d	a):h/menace{5mu}c/thickenace d	5mu 'thick'				

Math Accents & Constructs

Note that most basic accents can be stacked. For example, $\accepte{acute\{x\}}$ yields \acute{x} . Or, $\accepte{acute\{x\}}$ yields \acute{x} .

ź	\acute{x}	\dot{x}	\dot{x}	\overline{xyz}	\overline{xyz}	$\leftarrow \frac{xyz}{abc}$	\xleftarrow[abc]{xyz}	$\sum_{}^{K}$	\overset{K}{\sum}
\grave{x}	\grave{x}	\ddot{x}	\ddot{x}	xyz	\underline{xyz}	\xrightarrow{xyz} \xrightarrow{abc}	\xrightarrow[abc]{xyz}	$\sum_{k=1}$	lem:lem:lem:lem:lem:lem:lem:lem:lem:lem:
\bar{x}	\bar{x}	ž	$\c \c \$	\overrightarrow{xyz}	\overrightarrow{xyz}	\widehat{xyz}	\overbrace{xyz}	\sqrt{x}	\sqrt{x}
\hat{x}	\hat{x}	\vec{x}	\vec{x}	xyz	\overleftarrow{xyz}	xyz	\underbrace{xyz}	$\sqrt[n]{x}$	\sqrt[n]{x}
\tilde{x}	\tilde{x}	\widehat{xyz}	\widehat{xyz}	\overrightarrow{xyz}	\overleftrightarrow{xyz}	f, f', f'	f, f', f\prime		
$reve{x}$	\breve{x}	\widetilde{xyz}	\widetilde{xyz}	$\frac{abc}{xyz}$	\frac{abc}{xyz}	$\sum_{i=1}^{x} \sum_{k=1}^{j} a_{ik}$	$\left\{_y^x\right\}_{k^j}\sim$		

Binary Relations

Note that you can produce according negations by either adding the \not command as a prefix or ordinarily by preceding the commands with 'n'. For example, \not= or \neq turns = to \neq .

<	<	>	>	=	=	\in	\in	∋	\ni or \owns
\leq	$\leq or \leq o$	\geq	\geq or \ge	≡	\equiv	-	\vdash	-	\dashv
«	\11	>>	\gg	Ė	\doteq		\mid		\parallel
\prec	\prec	>	\succ	~	\sim	_	\smile	_	\frown
\preceq	\preceq	≽	\succeq	~	\simeq	3	\exists	_	\lnot or \neg
\subset	\subset	\supset	\supset	≈	\approx	=	\models	上	\perp
\subseteq	\subseteq	⊇	\supseteq	\simeq	\cong	\asymp	\asymp	\propto	\propto
	\sqsubset		\sqsupset	M	Join	≠	\neq	\forall	\forall
Γ	\sasiihsetea		\sasiinsetea	M	\howtie	⊄	\notin	/ \	\nrime \hacknrime

...

Binary Operators

Standard Operators

+	+	_	-	V \	lor or \vee	\wedge	\land or \wedge	□ □	\lhd	\triangleright	\rhd
\pm	\pm	Ŧ	\mp	⊕ \	oplus	\ominus	\ominus	∣⊴	\unline	⊵	\unrhd
×	\times		\cdot	⊙ \	odot	\oslash	\oslash	•	\bullet	0	\circ
÷	\div	\	\setminus	⊗ \	otimes	\circ	\bigcirc	*	\ast	*	\star
U	\cup	\cap	\cap	Δ \	bigtriangleup	∇	\bigtriangledown	ı 🔷	\diamond	₹	\wr
\sqcup	\sqcup	П	\sqcap	< \	triangleleft	\triangleright	\triangleright	П	\aggreen	₩	\uplus
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $											edge
					Func	01011	.5				
arco	cos \ar	coss	csc \cs	c injl	im \injlim	ma	x \max	tan	\tan		
arcs	in \ar	csin	deg \de	g ker	\ker	mir	n \min	tanh	\tanh		

proj lim

sec

 \sin

 \sinh

sup

\lg

\lim

 \ln

\log

\liminf

\limsup

 \varinjlim

ļim

lim

 $\overline{\lim}$

 226_0^1

\projlim

\sec

\sin

\sinh

sup

\varinjlim

\varprojlim

\varliminf

\varlimsup

\circlearrowright

\multimap

\operatorname{226}_0^1

...

Delimiters

arctan

arg

cos

cot

 \cosh

 \coth

det

dim

exp

gcd

hom

 \inf

\arctan

\arg

\cos

\cosh

\cot

\det

\dim

\exp

\gcd

\hom

\inf

 \lim

ln

log

lim inf

 \limsup

Note that you can produce according relatively sized symbols by preceding the commands with \left or \right. For example, \left(\frac{abc}{xyz}\right) turns $(\frac{abc}{xyz})$ to $(\frac{abc}{xyz})$. Sometimes commands can be preceded with '1' or 'r' e.g., \left\text{Vert makes } ||xyz||. Thus, giving the \Vert command properties of paired symbols.

Standard Delimiters

(([\lbrack or [($\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	L	\lfloor	Г	\ulcorner	↑	\uparrow
))]	\rbrack or]	>	\rangle	[\lceil	٦	\urcorner	↓	\downarrow
	\vert or	{	\lbrace or $\$	٦	\lceil	/	/	L	\llcorner	1	\Uparrow
	\Vert or \	}	\rbrace or \}	L	\lfloor	\	\backslash	١	\rcorner	₩	\Downarrow

Large Delimiters

ι	\lgroup	ر	\rgroup	_	\lmoustache	_	\rmoustache		\arrowvert	\Arrowvert	\bracevert

Arrows

	← \lei	ftarrow	or \get	ts \rightarrow	\rightar	row or	\to	←	\Lefta	rrow		\Rightarrow	\Right	tarr	OW
	< \lor	nglefta	rrow	\longrightarrow	\longrig	htarro	W	←	\Longl	eftarr	·ow	\Rightarrow	\Long1	righ	tarrow
	↔ \lei	ftright	arrow	\longleftrightarrow	\longlae	ftright	tarrow	\Leftrightarrow	\Leftr	ightar	row	\iff	\Long]	left	rightarrow
	↑ \upa	arrow		↓	\downarr	OW		1	\Uparr	OW		↓	\Downa	arro	W
	\$ \upo	downarr	OW	\mapsto	\mapsto			\$	Updown	arrow		\longmapsto	\longr	naps	to
	← \hoo	oklefta	rrow	\hookrightarrow	\hookrig	htarro	W	\iff	\iff (larger	spaces)				
	√ \nea	arrow			\searrow			/	\swarr	OW			\nwarı	row	
	< \nle	eftarro	W	→	\nrighta	rrow		#	\nLeft	arrow		*	\nRigh	htar	row
	↔ \nle	eftrigh	tarrow					⇔	\nLeft	righta	rrow				
		_		ļ				ņ		_		1			
+	\dashleftarro	w	>	\dashrigh	tarrow	⊨ =	\left	leftarrow	S	\Rightarrow	\rightr	coghtarro	√s ±	\rightarrow	$\label{leftright} \$
⊭	\Lleftarrow		\Rightarrow	\Rrightar	row	11	\upupa	arrows		#	\downdo	wnarrows	₹	\rightarrow	\rightleftarrows
1	\upharpoonlef	t	1	\upharpoo	nright	1	\downl	harpoonle	ft	l	\downha	rpoonrig	nt =	=	\leftrightharpoons
~~	\twoheadlefta	rrow	→	\twoheadr	ightarrow	←	\lefta	arrowtail		\rightarrow	\righta	rrowtail	=	<u></u>	\rightleftharpoons
ń	\Lsh		r	\Rsh		- ←	\100pa	arrowleft		9→	\loopar	rowright			

Q

\curvearrowright \rightsquigarrow

Matrices

Note that any of the following can also be displayed inline as well as stand-alone. It's recommended that you use smallmatrix for this. Thus, you must preced and succeed \begin and \end smallmatrix with \left<delimiter> and \right<delimiter>, respectively. For example, \left(\begin{smallmatrix}a & b & c\x & y & z\end{smallmatrix}\right) yields $\begin{pmatrix} a & b & c \\ x & y & z \end{pmatrix}$.

\circlearrowleft

\leftrightsquigarrow

Basic Syntax

Dots

Array Environment

•••

Sizes

Math Mode

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad \text{displaystyle x=\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}} \\ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad \text{textstyle x=\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}} \\ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad \text{scriptstyle x=\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}} \\ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad \text{scriptscriptstyle x=\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}} \\ \text{scriptscriptscriptscriptstyle x=\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}} \\ \text{scriptscriptscriptscriptstyle x=\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}} \\ \text{scriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscriptscrip$$

Text Mode

tiny	\tiny{tiny}	normal	\normalsize{normal}	huge	\huge{huge}
script	\scriptsize{script}	large	\large{large}		
footnote	\footnotesize{footnote}	Large	\Large{Large}	Huge	\Huge{Huge}
small	\small{small}	LARGE	\LARGE{LARGE}		