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 , v	\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	£, \$	$, \$
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	$\mathbf{XYZ} \mathbf{xyz}$	XYZ	\mathbb{XYZ}
XYZ xyz	\mathnormal{XYZ\ xyz}	XYZ xyz	$XYZ\ xyz$	xyz	\mathbf{XYZ}
XYZ xyz	\mathit{XYZ\ xyz}	XYZ xyz	$XYZ\ xyz$	XY3	\mathbf{XYZ}
XYZ xyz	\mathrm{XYZ\ xyz}				

Spacing

		D. C	1.1	. \ 1 \ \ \ [2 - 2 - \ 1 \ \ 1	N 9 (41.1)
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	dad	$\verb a negthickspace b mspace{-5mu}c negthickspace d $	Neg. 5mu 'thick'
$a\ b\ c\ d$	ab\mspace{3mu}c\thinspace d	3mu 'thin'	a b	ab	Width of 'xxx'
$a\ b\ c\ d$	$a\:b\mspace{4mu}c\mspace d$	4mu 'medium'			
$a\ b\ c\ d$	a\;b\mspace{5mu}c\thickspace 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} .

\acute{x}	\acute{x}	\dot{x}	\dot{x}	\overline{xyz}	\overline{xyz}	$\stackrel{xyz}{\leftarrow}$	\xleftarrow[abc]{xyz}	\sum_{K}	$\operatorname{Voverset}\{K\}_{\sum}$
ù	\grave{x}	\ddot{x}	\ddot{x}	xyz	\underline{xyz}	\xrightarrow{xyz}	\xrightarrow[abc]{xyz}	$\sum_{k=1}$	lem:lem:lem:lem:lem:lem:lem:lem:lem:lem:
						<u>~</u>		n=1	
\bar{x}	\bar{x}	ž	\check{x}	\overrightarrow{xyz}	\overrightarrow{xyz}	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}	$y \sum_{k}^{j}$	$\label{final} $$ \left(y^x \right)_{k^j} \sum_{k^j} \sum_{k^j} \sum_{k^j} \sum_{k^j} \left(y^k \right)_{k^j} $		

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 .

Standard Relations

<	<	>	>	=	=	\in	\in	€	\ni or \owns
\leq	$\leq or \leq o$	\geq	\geq or \ge	≡	\equiv	-	\vdash	⊣	\dashv
«	\11	>>	\gg	Ė	\doteq		\mid	ll l	\parallel
\prec	\prec	>	\succ	~	\sim	_	\smile	_	\frown
\preceq	\preceq	≽	\succeq	~	\simeq	3	\exists	_	\lnot or \neg
\subset	\subset	\supset	\supset	\approx	\approx	=	\models	丄	\perp
\subseteq	\subseteq	⊇	\supseteq	\simeq	\cong	\asymp	\asymp	\propto	\propto
	\sqsubset		\sqsupset	M	Join	≠	\neq	\forall	\forall
	\sasubsetea		\sasupsetea	\bowtie	\bowtie	∉	\notin	7. \	\prime. \backprime

Additional Relations

<	\lessdot	>	\gtrdot	\subseteq	\subseteqq	\supseteq	\supseteqq
≤	\leqslant	≥	\geqslant	€	\Subset	∍	\Supset
<	\eqslantless	⊳	\eqslantgtr		\sqsubset	\Box	\sqsupset
\leq	\leqq	\geq	\geqq	·:.	\therefore	·.·	\because
~	\lll or \llless	>>>	\gggtr	1	\shotmid	П	\shortparallel
≨	\lessapprox	≥	\gtrapprox	~	\smallsmile	$\overline{}$	\smallfrown
≶	\lessgtr	≷	\gtrless	⊲	\vartriangleleft	\triangleright	\vert riangleright
VI/VII/	\lesseqgtr	\IV\IV	\gtreqless	⊴	\trianglelefteq	⊵	\trianglerighteq
⋚	\lesseqqgtr	$ \geq $	\gtreqqless	◀	$\blue{blacktriangleleft}$	•	\blacktriangleright
≼	\precurlyeq	≽	\succcurlyeq	÷	\doteqdot or \Doteq	<u>•</u>	\circeq
\Rightarrow	\curlyeqprec	⋟	\curlyeqsucc	≓	\risingdotseq	Έ.	\fallingdotseq
\preceq	\precsim	≿	\succsim	≖	\eqcirc	≜	\tirangleeq
≋	\precapprox	±≋	\succapprox		\bumpeq	≎	\Bumpeq

Binary Operators

Standard Operators

+	+	_	-	\ \	\lor or \vee	_ ^	\land or \wedge	⊲	\1hd	\triangleright	\rhd
\pm	\pm	Ŧ	\mp	0	\oplus	Θ	\ominus	⊴	\unlhd	⊵	\unrhd
×	\times		\cdot	0	\odot	0	\oslash	•	\bullet	0	\circ
÷	\div	\	\setminus	8	\otimes	0	\bigcirc	*	\ast	*	\star
U	\cup	\cap	\cap	Δ	\bigtriangleup	∇	\bigtriangledown	♦	\diamond	₹	\wr
\sqcup	\sqcup	П	\sqcap	◁	\triangleleft	⊳	\triangleright	П	\amalg	₩	\uplus

Additional Operators

÷	\dotplus		\centerdot	⊞	\boxplus		\boxminus	*	\divideontimes
\bowtie	\ltimes	×	\rtimes	\boxtimes	\boxtimes		\boxdot	*	\circledast
U	\Cup or \doublecup	M	\Cap or \doublecap	\rightarrow	\leftthreetimes	/	\rightthreetimes	0	\circledcirc
$\underline{\vee}$	\veebar	_	\barwedge	Υ	\curlyvee	人	\curlywedge	Θ	\circleddash
_	\doublebarwedge	Т	\intercal	\	\setminus	\	\smallsetminus		

Large Operators

\sum	\sum	 	\int	ſſſ	$\ilde{\label{limit}}$	\cap	\bigcap	\oplus	\bigoplus	V	bigvee
Π	\prod	∮	\oint	ſſſſ	$\ilde{\text{liiint}}$	U	\bigcup	\otimes	\bigotimes	\wedge	\bigwedge
П	\coprod	l ff	\iint			[+J	\bigoplus	\odot	\bigodot		\bigsqcup

Functions

arco	os \arcoss	csc	\csc	inj lim	\injlim	max	\max	tan	\tan
arcs	in \arcsin	deg	\deg	ker	\ker	min	\min	tanh	\tanh
arct	an \arctan	det	\det	lg	\lg	Pr	\Pr	\varinjlim	\varinjlim
arg	\arg	dim	\dim	lim	\lim	proj lim	\projlim	lim	\varprojlim
cos	\cos	exp	\exp	lim inf	\liminf	sec	\sec	lim	\varliminf
cosh	\cosh	gcd	\gcd	lim sup	\label{limsup}	sin	\sin	$\overline{\lim}$	\varlimsup
\cot	\cot	hom	\mbox{hom}	ln	\ln	sinh	\sinh	226_0^1	\operatorname{226}_0^1
41		c	١٠.٠	1	\ 7			1	

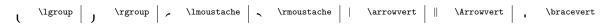
Delimiters

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

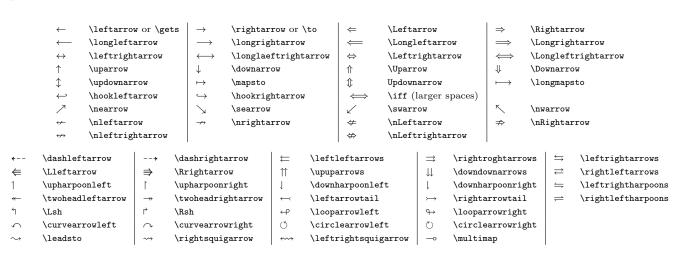
Standard Delimiters

(([\lbrack or [(\langle	L	\lfloor	Г	\ulcorner	↑	\uparrow
))]	\rbrack or]	>	\rangle	[\lceil	٦	\urcorner	↓	\downarrow
	\vert or	{	\lbrace or $\{$	Γ	\lceil	/	/	L	\llcorner	1	\Uparrow
- II	\Vert or \	}	\rbrace or \}	l ı	\lfloor	\	\backslash		\rcorner	JL	\Downarrow

Large Delimiters



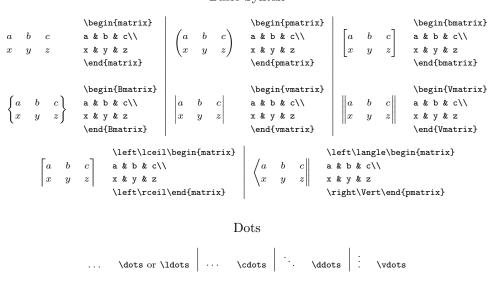
Arrows



Matrices & Arrays

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 $\begin{pmatrix} a & b & c \\ x & y & z \end{pmatrix}$.

Basic Syntax



Array Environment

Note that arrays operate in the same manner as tables such that they permit column alignment 1, c and r etc., columns can be divided using pipes (|) new row lines with \setminus , and the use of $\$ to name a few examples. Columns are separated the same as within tables; with (n-1) & ampersand symbols, for n columns. Some simple examples follow.

Relative Font Sizes

Math Mode

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad \text{displaystyle x=\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}}$$

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

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

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}		