LATEX Mathematical Symbols

The more unusual symbols are not defined in base LATEX (NFSS) and require \usepackage{amssymb}

1 Greek and Hebrew letters

α	\alpha	κ	\kappa	ψ	\psi	F	\digamma	Δ	\Delta	Θ	\Theta
β	\beta	λ	\lambda	ρ	\rho	ε	\varepsilon	Γ	\Gamma	Υ	\Upsilon
χ	\chi	μ	\mu	σ	\sigma	\varkappa	\varkappa	Λ	\Lambda	Ξ	\Xi
δ	\delta	ν	\nu	au	\tau	φ	\varphi	Ω	\Omega		
ϵ	\epsilon	o	0	θ	\theta	ϖ	\varpi	Φ	\Phi	×	\aleph
η	\eta	ω	\omega	v	\upsilon	ϱ	\varrho	Π	\Pi	コ	\beth
γ	\gamma	ϕ	\phi	ξ	\xi	ς	\varsigma	Ψ	\Psi	٦	\daleth
ι	\iota	π	\pi	ζ	\zeta	ϑ	\vartheta	\sum	\Sigma	ב	\gimel

2 LATEX math constructs

$\frac{abc}{xyz}$	$\frac{abc}{xyz}$	\overline{abc}	$\verb \overline \{abc\}$	\overrightarrow{abc}	$\verb \overrightarrow{ } abc $
f'	f'	\underline{abc}	\underline{abc}	\overleftarrow{abc}	$\verb \overleftarrow{ } abc $
\sqrt{abc}	\sqrt{abc}	\widehat{abc}	\widehat{abc}	\widehat{abc}	$\operatorname{\mathtt{oronoon}}$
$\sqrt[n]{abc}$	$\sqrt[n]{abc}$	\widetilde{abc}	$\verb \widetilde \{abc\}$	\underline{abc}	$\verb \underbrace \{abc\}$

3 Delimiters

	{	\{	L	\lfloor	/	/	⇑	\Uparrow	∟	\llcorner
\vert	}	\}		\rfloor	\	\backslash	↑	\uparrow	_	\lrcorner
\	<	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	Γ	\lceil	[[\Downarrow	\Downarrow	Γ	\ulcorner
\Vert	\rangle	\rangle	1	\rceil]]	\downarrow	\downarrow	٦	\urcorner

Use the pair $\ \left| \text{left} s_1 \right| = \text{left} \left| \text{cand } \text{right} s_2 \right| = \text{left} \left| \text{cand } \text{s}_2 \right| = \text{left} \left| \text{cand } \text{cand } \text{s}_2 \right| = \text{left} \left| \text{cand } \text{cand$

4 Variable-sized symbols (displayed formulae show larger version)

\sum	\sum	ſ	$\$ int	+	\biguplus	\oplus	\bigoplus	V	\bigvee
Π	\prod	∮	\oint	\cap	\bigcap	\otimes	\bigotimes	\wedge	\bigwedge
\prod	\coprod	Ĭſ	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	U	\bigcup	\odot	\bigodot		\bigsqcup

5 Standard Function Names

Function names should appear in Roman, not Italic, e.g., Correct: $tan(at-n\pi) \longrightarrow tan(at-n\pi)$ Incorrect: $tan(at-n\pi) \longrightarrow tan(at-n\pi)$

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

6 Binary Operation/Relation Symbols

*	\ast	\pm	\pm	\cap	\cap	\triangleleft	\lhd
*	\star	Ŧ	\mp	U	\cup	\triangleright	\rhd
	\cdot	П	\amalg	\forall	\uplus	< □	\triangleleft
0	\circ	\odot	\odot	П	\sqcap	\triangleright	\triangleright
•	\bullet	\ominus	\ominus	Ш	\sqcup	⊴	\unlhd
O	\bigcirc	\oplus	\oplus	\wedge	\wedge	<u> </u>	\unrhd
\lambda	\diamond	Ø	\oslash	\ \	\vee	∇	\bigtriangledown
×	\times	8	\otimes	†	\dagger	$\stackrel{\vee}{\triangle}$	\bigtriangleup
÷	\div	€	\wr	‡	\ddagger \ddagger	\	\setminus
	\centerdot		\Box	*	\barwedge	<u>\</u>	\veebar
*	\circledast		\boxplus	人	\curlywedge	Ϋ́	\curlyvee
••	\circledast \circledcirc		\boxpius \boxminus		\Cap	U	\Cup
	\circledcirc		\boxtimes	<u></u>	\bot	T	\top
⊝ ∔					\intercal		-
	\dotplus \divideontimes		\boxdot	<u>T</u>			\rightthreetimes
*	\d1v1deont1mes		\square	^	\doublebarwedge	λ	\leftthreetimes
≡	\equiv	\leq	\leq	\geq	\geq	\perp	\perp
\cong	\cong	\prec	\prec	\succ	\succ		\mid
\neq	\neq	\preceq	\preceq	\succeq	\succeq		\parallel
\sim	\sim	~	\11	\gg	\gg	\bowtie	\bowtie
\simeq	\simeq	\subset	\subset	\supset	\supset	M	\Join
\approx	\approx	\subseteq	\subseteq	\supseteq	\supseteq	\bowtie	\ltimes
\simeq	\asymp		\sqsubset		\sqsupset	\rtimes	\rtimes
\doteq	\doteq		\sqsubseteq	\supseteq	\sqsupseteq	$\overline{}$	\smile
\propto	\propto	\exists	\dashv	<u> </u>	\vdash	$\overline{}$	\frown
=	\models	\in	\in	∋	\ni	∉	\notin
·						,	
\approx	\approxeq	\leq	\leqq	\geq	\geqq	≶	\lessgtr
\sim	\thicksim	\leq	\leqslant	\geqslant	\geqslant	\leq	\lesseqgtr
\sim	\backsim	≨	\lessapprox	\gtrapprox	\gtrapprox	W	\lesseqqgtr
\geq	\backsimeq	~	\111	>>>	\ggg	\geq	\gtreqqless
\triangleq	\triangleq	<	\lessdot	≽	\gtrdot	<u>></u>	\gtreqless
<u>•</u>	\circeq	<	\lesssim	\gtrsim	\gtrsim	\geqslant	\gtrless
<u>~</u>	\bumpeq	\lesssim \ll	\eqslantless		\eqslantgtr)	\backepsilon
≎	\Bumpeq	\preceq	\precsim	%Y2Y W	\succsim	Ŏ	\between
÷	\doteqdot	X7X	\precapprox	∑	\succapprox	ĥ	\pitchfork
≈	\thickapprox	~ ∈	\Subset	≈	\Supset	ı	\shortmid
≒.	\fallingdotseq	\subseteq	\subseteqq	\supseteq	\supseteqq		\smallfrown
<u>=</u>	\risingdotseq	_	\sqsubset	_	\sqsupset	\cup	\smallsmile
∝	\varpropto	_ ≼	\preccurlyeq	≽	\succcurlyeq	I	\Vdash
·.	\therefore	¥	\curlyeqprec	>	\curlyeqsucc	=	\vDash
• • •	\because	4	\blacktriangleleft	•	\blacktriangleright	III	\Vvdash
• ==	\eqcirc	⊴	\trianglelefteq	⊵	\trianglerighteq	11	\shortparallel
\neq	\neq	\triangleleft	\vartriangleleft	\triangleright	\vartriangleright	H	\nshortparallel
~ ′′	,	J	\ 7	\/		<i>d</i>	
¥	\ncong	\$	\nleq	***	\ngeq	⊭	\nsubseteq
ł	\nmid	$\not\geq$	\nleqq	\neq	\ngeqq	\neq	\nsupseteq
#	\nparallel	≰	\nleqslant	*	\ngeqslant	$\not\equiv$	\nsubseteqq
1	\nshortmid	*	\nless		\ngtr	\neq	\nsupseteqq
Ħ	\nshortparallel	+	\nprec	7	\nsucc	\subsetneq	\subsetneq
∞	\nsim	$\not\preceq$	\npreceq	$\not\succeq$	\nsucceq		\supsetneq
$\not\Vdash$	\nVDash	≨	\precnapprox	≿ ≋	\succnapprox	≠	\subsetneqq
¥	\nvDash	$\not \supset$	\precnsim	\searrow	\succnsim	\supseteq	\supsetneqq
$\not\vdash$	\nvdash	≨	\lnapprox	⋧	\gnapprox	\neq	\varsubsetneq
	\ntriangleleft	\leq	\lneq	\geq	\gneq	\supseteq	\varsupsetneq
⊉	\n	≨	\lneqq	\geq	\gneqq	≨	\varsubsetneqq
\not	\ntriangleright	#^\$^\#\\$\#\\$\#\#\	\lnsim	#V*V#V*V*Y**	\gnsim	$ \supseteq $	$\var{supsetneqq}$
⋭	\n	\leq	\lvertneqq	\geq	\gvertneqq		

7 Arrow symbols

	J				
\leftarrow	\leftarrow		\longleftarrow	↑	\uparrow
\Leftarrow	\Leftarrow	\iff	\Longleftarrow	\uparrow	\Uparrow
\longrightarrow	\rightarrow	\longrightarrow	\longrightarrow	\downarrow	\downarrow
\Rightarrow	\Rightarrow	\Longrightarrow	\Longrightarrow	\Downarrow	\Downarrow
\longleftrightarrow	\leftrightarrow	\longleftrightarrow	\longleftrightarrow	1	\updownarrow
\Leftrightarrow	\Leftrightarrow	\iff	\Longleftrightarrow	1	\Updownarrow
\mapsto	\mapsto	\longmapsto	\longmapsto	7	\nearrow
\leftarrow	\hookleftarrow	\hookrightarrow	\hookrightarrow		\searrow
_	\leftharpoonup	\rightarrow	\rightharpoonup	/	\swarrow
$\overline{}$	\leftharpoondown	\rightarrow	\rightharpoondown	_	\nwarrow
\rightleftharpoons	\rightleftharpoons	~→	\leadsto		
>	\dashrightarrow	←	\dashleftarrow	⊭	\leftleftarrows
$\stackrel{\longleftarrow}{\longrightarrow}$	\leftrightarrows	\Leftarrow	\Lleftarrow	←	\twoheadleftarrow
\leftarrow	\leftarrowtail	\leftarrow P	\looparrowleft	\leftrightharpoons	\leftrightharpoons
$ \leftarrow $	\curvearrowleft	Q	\circlearrowleft	Ħ	\Lsh
$\uparrow\uparrow$	\upuparrows	1	\upharpoonleft	1	\downharpoonleft
_0	\multimap	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	$\$ leftrightsquigarrow	\Rightarrow	\rightrightarrows
\rightleftharpoons	$\$ rightleftarrows	\Rightarrow	\rightrightarrows	$\stackrel{\longrightarrow}{\longleftrightarrow}$	\rightleftarrows
\longrightarrow	\twoheadrightarrow	\rightarrowtail	\rightarrowtail	\rightarrow	$\label{looparrowright}$
\rightleftharpoons	\rightleftharpoons	\curvearrowright	\curvearrowright	\bigcirc	\circlearrowright
ightharpoons	\Rsh	$\downarrow\downarrow$	\downdownarrows	1	\upharpoonright
ļ	\downharpoonright	~ →	\rightsquigarrow		
←	\nleftarrow	\rightarrow	\nrightarrow	#	\nLeftarrow
\Rightarrow	\nRightarrow	\leftrightarrow	\nleftrightarrow	⇔	\n

8 Miscellaneous symbols

∞	\infty	\forall	\forall	\Bbbk	\Bbbk	Ø	\wp
∇	\nabla	∃	\exists	\star	\bigstar	_	\angle
∂	\partial	∄	\nexists		\diagdown	4	\measuredangle
\mathfrak{F}	\eth	Ø	\emptyset	/	\diagup	\triangleleft	\sphericalangle
*	\clubsuit	Ø	\vert varnothing	\Diamond	\Diamond	C	\complement
\Diamond	\diamondsuit	\imath	\imath	\exists	\Finv	∇	\triangledown
\Diamond	\heartsuit	Ĵ	\jmath	G	\Game	\triangle	\triangle
•	\spadesuit	ℓ	\ell	\hbar	\hbar	Δ	\vartriangle
• • •	\cdots	ſſſſ	\iiiint	\hbar	\hslash	•	\blacklozenge
:	\vdots	$\int \int \int$	\iiint	\Diamond	\lozenge		\blacksquare
	\ldots	ĨĴĴ	\iint	Ω	\mho	•	\blacktriangle
٠	\ddots	#	\sharp	,	\prime	•	\blacktrinagledown
\Im	\Im	b	\flat		\square	1	\backprime
\Re	\Re	þ	\natural	$\sqrt{}$	\surd	\odot	\circledS

9 Math mode accents

$cute{a}$	\acute{a}	\bar{a}	$\text{ar{a}}$	Á	\Acute{\Acute{A}}	$ar{ar{A}}$	\Bar{\Bar{A}}
$reve{a}$	$\verb \breve {a} $	\check{a}	$\verb+\check+\{a\}$	Ă	\Breve{\Breve{A}}	Ă	$\Check{\Check{A}}$
\ddot{a}	\dot{a}	\dot{a}	$\det\{a\}$	Ä	\Ddot{\Ddot{A}}	\dot{A}	\Dot{\Dot{A}}
\grave{a}	$\texttt{\grave}\{a\}$	\hat{a}	\hat{a}	À	$\Grave{\Grave{A}}$	$\hat{\hat{A}}_{}$	\Hat{\Hat{A}}
\tilde{a}	\hat{a}	\vec{a}	$\operatorname{\vec}\{a\}$	$ ilde{ ilde{A}}$	<pre>\Tilde{\Tilde{A}}</pre>	$ec{ec{A}}$	\Vec{\Vec{A}}

10 Array environment, examples

Simplest version: $\begin{array}{cols} row_1 \setminus row_2 \setminus \dots row_m \end{array}$ where cols includes one character [1rc] for each column (with optional characters | inserted for vertical lines) and row_i includes character & a total of (n-1) times to separate the n elements in the row. Examples:

$$\left(\begin{array}{cc} 2\tau & 7\phi - \frac{5}{12} \\ 3\psi & \frac{\pi}{8} \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) \text{ and } \left[\begin{array}{cc} 3 & 4 & 5 \\ 1 & 3 & 729 \end{array} \right]$$

 $f(z) = \left\{ \left\{ \left\{ \frac{z^2}+\cos z \right\} & \left\{ fcr \right\} \right. \\ \left\{ \left[z \right] < 0 & \left[fcr \right] & 3 \right] \\ \left\{ z \right] < 0 & \left[fcr \right] & 3 \right] \\ \left\{ sin\left\{ z \right\} & \left[fcr \right] & \left[z \right] > 5 \\ \left\{ array \right\} \right] .$

$$f(z) = \begin{cases} \overline{z^2 + \cos z} & \text{for } |z| < 3\\ 0 & \text{for } 3 \le |z| \le 5\\ \sin \overline{z} & \text{for } |z| > 5 \end{cases}$$

11 Other Styles (math mode only)

Caligraphic letters: \$\mathcal{A}\\$ etc.: $\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$

Mathbb letters: \$\mathbb{A}\\$ etc.: ABCDEFGHIJKLMNOPQRSTUVWXYZ

Mathfrak letters: \$\mathfrak{A}\$ etc.: ABCDEFGSJJKLMMDPQRGTUVWXJJabc123

 $\textbf{Math Sans serif letters: } \\ \textbf{Mathsf{A}} \\ \textbf{Setc.: ABCDEFGHIJKLMNOPQRSTUVWXYZabc123} \\ \textbf{Math Sans serif letters: } \\ \textbf{Mathsf{A}} \\ \textbf{Setc.: ABCDEFGHIJKLMNOPQRSTUVWXYZabc123} \\ \textbf{Mathsf{A}} \\ \textbf{MathsfaA} \\ \textbf{MathsfaA} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{MathsfaA} \\ \textbf{MathsfaA} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{Mathsf{A}} \\ \textbf{Mat$

 $Math\ bold\ letters:\ \$\mathbf{A}\ \$\ etc.:\ ABCDEFGHIJKLMNOPQRSTUVWXYZ\ abc\ 123$

 $\begin{tabular}{ll} Math bold italic letters: define $$\mathbf{A} \otimes \mathbf{F} GHIJKLMNOPQRSTUVWXYZ & abc & 123 \end{tabular}$

12 Font sizes

Math Mode: $\int f^{-1}(x - x_a) dx$ $\int f^{-1}(x - x_a) dx$ $\int f^{-1}(x - x_a) dx$ $\int f^{-1}(x - x_a) dx$

\${\displaystyle \int f^{-1}(x-x_a)\,dx}\$
\${\textstyle \int f^{-1}(x-x_a)\,dx}\$
\${\scriptstyle \int f^{-1}(x-x_a)\,dx}\$
\${\scriptscriptstyle \int f^{-1}(x-x_a)\,dx}\$

Text Mode: \sc

 $\label{eq:local_small_small} $$ \begin{array}{ll} \text{\colored} & \text{\colored} \\ \text{\colored} \\ \text{\colored} \\ \text{\colored} & \text{\colored} \\ \text{\c$

 $\label{eq:huge} \begin{array}{l} \text{huge} = huge \\ \text{Huge} = Huge \end{array}$

13 Text Mode: Accents and Symbols

\'{o} \"{o} \^{o} \'{o} \d s ó ö ô ò \~{o} \={o} \.{o} \u{o} \H{o} \t{oo} \c{o} \d{o} \r s Q ″ ∖H s ō \b{o} Å \AA å \aa \ss \i ۱j 1 J Ø \P $\hat{\mathbf{s}}$ \t s \v s \0 \S \0 Ø Æ \AE \ddag © \copyright æ \ae \dag \pounds