IATEX 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	Ω		
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}	\overleftarrow{abc}
	\sqrt{abc}	\widehat{abc}	\widehat{abc}	\widehat{abc}	$\operatorname{\mathtt{Noverbrace}}\{\operatorname{abc}\}$
$\sqrt[n]{abc}$	$\sqrt[n]{abc}$	abc	$\verb \widetilde \{abc\}$	\underbrace{abc}	\underbrace{abc}

3 Delimiters

	{	\{	L	\lfloor	/	/	\uparrow	\Uparrow	L	\llcorner
\vert	}	\}		\rfloor	\	\backslash	\uparrow	\uparrow	_	\lrcorner
\1	<	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	Γ	\lceil	[[\Downarrow	\Downarrow	Г	\ulcorner
\Vert	\rangle	\rangle	1	\rceil	1	1		\downarrow	\neg	\urcorner

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

\sum	\sum	<pre>∫ \int</pre>	.	\biguplus	\oplus	\bigoplus	V	\bigvee
	\prod	∮ \oin	t N	\bigcap	\otimes	\bigotimes	\wedge	\bigwedge
H	\coprod	∫∫ \iin	t []	\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	干	\mp	U	\cup	\triangleright	\rhd
	\cdot	Й	\amalg	\forall	\uplus	◁	\triangleleft
0	\circ	\odot	\odot	П	\sqcap	\triangleright	\triangleright
•	\bullet	\ominus	\ominus	Ш	\sqcup	\leq	\unlhd
\bigcirc	\bigcirc	\oplus	\oplus	\wedge	\wedge	\succeq	\unrhd
♦	\diamond	0	\oslash	<i>/ \</i>	\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	<u></u>	\Cap	U	\Cup
					_	T	=
⊝	\circleddash		\boxtimes	Τ	\bot		\top
<u> </u>	\dotplus		\boxdot	<u>T</u>	\intercal		\rightthreetimes
*	\divideontimes		\square	^	\doublebarwedge	\rightarrow	\leftthreetimes
=	\equiv	\leq	\leq	\geq	\geq	\perp	\perp
\cong	\cong	$\stackrel{-}{\prec}$	\prec	>	\succ		\mid
\neq	\neq	\preceq	\preceq	\succeq	\succeq	İ	\parallel
\sim	\sim	_ «	\11	_ ≫	\gg	\bowtie	\bowtie
\simeq	\simeq	Ċ	\subset	Š	\supset	×	\Join
\approx	\approx	\subseteq	\subseteq	\supseteq	\supseteq	×	\ltimes
\simeq	\asymp	_	\sqsubset	_	\sqsupset	×	\rtimes
≟	\doteq		\sqsubseteq	⊒	\sqsupseteq		\smile
\propto	\propto	=	\dashv	<i>=</i> ⊢	\vdash	$\overline{}$	\frown
<u></u>	\models	\in	\in	€	\ni	∉	\notin
_	/mode12	_	/111	J	/111	۶	/1100111
\approx	\approxeq	\leq	\leqq	\geq	\geqq	\leq	\lessgtr
\sim	\thicksim	\leq	\leqslant	\geqslant	\geqslant	\leq	\lesseqgtr
\sim	\backsim	≨	\lessapprox	\gtrapprox	\gtrapprox	W	\lesseqqgtr
\leq	\backsimeq	~	\111	>>>	\ggg	\geq	\gtreqqless
\triangleq	\triangleq	<	\lessdot	>	\gtrdot	>	\gtreqless
<u>•</u>	\circeq	\lesssim	\lesssim	\gtrsim	\gtrsim	\geqslant	\gtrless
≏	\bumpeq	<i>(</i>	\eqslantless		\eqslantgtr	€	\backepsilon
≎	\Bumpeq	W Y?Y?	\precsim	%Y	\succsim	Ŏ	\between
÷	\doteqdot	\sim	\precapprox	~ _	\succapprox	Å	\pitchfork
· ≈	\thickapprox	≈ ∈	\Subset	≈	\Supset	1	\shortmid
≒.	\fallingdotseq	\subseteq	\subseteqq		\supseteqq	^	\smallfrown
≓	\risingdotseq	=	\sqsubset	\supseteq	\sqsupset	\cup	\smallsmile
\propto	\varpropto	≼	\preccurlyeq	≽	\succcurlyeq	I	\Vdash
·:	\therefore	$\stackrel{\sim}{ imes}$	\curlyeqprec	<u>/</u>	\curlyeqsucc	<u> </u>	\vDash
• • •	\because	À	\blacktriangleleft	, >	\blacktriangleright	i⊢	\Vvdash
•	\eqcirc	⊴	\trianglelefteq	⊵	\trianglerighteq		\shortparallel
	\neq	7	\vartriangleleft	\triangleright	\vartriangleright	11	\nshortparallel
\neq	\med	7	(var criangiereic		/vartriangleright	Ħ	(IISHOI charaffer
\ncong	\ncong	≰	\nleq	≱	\ngeq	⊈	\nsubseteq
1	\nmid	\$\$\$\$	\nleqq	***	\ngeqq	⊉	\nsupseteq
$\dot{\dagger}$	\nparallel	₹	\nleqslant	¥	\ngeqslant	Ź	\nsubseteqq
'' ∤	\nshortmid	<i>t</i>	\nless	*	\ngtr	∌	\nsupseteqq
' #	\nshortparallel		\nprec		\nsucc	<i>=</i>	\subsetneq
~ ~	\nsim	⊀	\npreceq	$^{''}\!$	\nsucceq	Ź	\supsetneq
¥	\nVDash	<i>+</i>	\precnapprox	<i>≠</i>	\succnapprox	Ž	\subsetneqq
<i>x</i> ¹ ⊭	\nvDash	≈ ≺	\precnappiox	≈ ≻	\succnsim	₹	\supsetneqq
¥	\nvdash	× <	\lnapprox	$\stackrel{\sim}{>}$	\gnapprox	\neq	\varsubsetneqq
	\ntriangleleft	#^\$^\#^\$\@\\$\#\\$\	\lnapprox \lneq	#V&V#V*V*V*X#Y#X	\gnapprox \gneq		\varsupsetneq
⊅ A	\ntrianglelefteq	<i>></i>	=	<i>\$</i>		\neq	\varsubsetneqq
\$ ₹		\neq	\lneqq	₹	\gneqq	₹	
⋫	\ntriangleright	<i></i> ≥⁄	\lnsim	$\stackrel{\checkmark}{>}$	\gnsim	≠	\varsupsetneqq
$\not\sqsubset$	\n		$lem:lemma_lemma$		\gvertneqq		

7 Arrow symbols

	v				
\leftarrow	\leftarrow	←	\longleftarrow	↑	\uparrow
\Leftarrow	\Leftarrow	\iff	\Longleftarrow	\uparrow	\Uparrow
\rightarrow	\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		\rightharpoonup	/	\swarrow
$\overline{}$	\leftharpoondown	\rightarrow	\rightharpoondown	_	\nwarrow
\rightleftharpoons	\rightleftharpoons	~ →	\leadsto		
>	\dashrightarrow	←	\dashleftarrow	\Leftarrow	\leftleftarrows
\Longrightarrow	$\$ leftrightarrows	\Leftarrow	\Lleftarrow	~~	\twoheadleftarrow
\longleftrightarrow	\leftarrowtail	\leftarrow	\looparrowleft	\leftrightharpoons	\leftrightharpoons
$ \leftarrow $	\curvearrowleft	Q	\circlearrowleft	$ \uparrow $	\Lsh
$\uparrow\uparrow$	\upuparrows	1	\upharpoonleft	1	\downharpoonleft
_	\multimap	~~~	$\$ leftrightsquigarrow	\Rightarrow	\rightrightarrows
ightleftarrows	$\$ rightleftarrows	\Rightarrow	\rightrightarrows	$\stackrel{\longleftarrow}{\longleftrightarrow}$	\rightleftarrows
\longrightarrow	$\$ twoheadrightarrow	\rightarrowtail	\rightarrowtail	\rightarrow	\looparrowright
\rightleftharpoons	$\$ rightleftharpoons	\curvearrowright	\curvearrowright	\bigcirc	\circlearrowright
Γ,	\Rsh	$\downarrow\downarrow$	\downdownarrows	1	\upharpoonright
ļ	\downharpoonright	~ →	\rightsquigarrow		
↔	\nleftarrow	$\rightarrow \rightarrow$	\nrightarrow	#	\nLeftarrow
\Rightarrow	\n Rightarrow	$\leftrightarrow \rightarrow$	\nleftrightarrow	#	\n

8 Miscellaneous symbols

∞	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	\forall	\forall	\Bbbk	\Bbbk	Ø	\wp
∇	\nabla	3	\exists	*	\bigstar	_	\angle
∂	\partial	∄	\nexists		\diagdown	4	\measuredangle
ð	\eth	Ø	\emptyset	/	\diagup	⋖	\sphericalangle
*	\clubsuit	Ø	\varnothing	\Diamond	\Diamond	C	\complement
\Diamond	\diamondsuit	\imath	\imath	Е	\Finv	∇	\triangledown
\Diamond	\heartsuit	Ĵ	\jmath	G	\Game	\triangle	\triangle
	\spadesuit	ℓ	\ell	\hbar	\hbar	Δ	\vartriangle
	\cdots	ſſſſ	\iiiint	\hbar	\hslash	•	\blacklozenge
÷	\vdots	ſſſ	\iiint	\Diamond	\lozenge		\blacksquare
	\ldots	ĴĴ	\iint	Ω	\mho	A	\blacktriangle
٠	\ddots	#	\sharp	,	\prime	▼	\blacktrinagledown
\Im	\Im	þ	\flat		\square	1	\backprime
\Re	\Re	Ц	\natural	$\sqrt{}$	\surd	\bigcirc	\circledS

9 Math mode accents

$cute{a}$	$\texttt{\acute}\{a\}$	\bar{a}	$\text{ar{a}}$	Á	\Acute{\Acute{A}}	$ar{ar{A}}$	\Bar{\Bar{A}}
$reve{a}$	$\texttt{\breve}\{a\}$	\check{a}	$\verb+\check+\{a\}$	Ă	\Breve{\Breve{A}}	Å	$\Check{\Check{A}}$
\ddot{a}	\dot{a}	\dot{a}	\dot{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}	$\verb \tilde \{a\}$	\vec{a}	$\operatorname{\vec}\{a\}$	$ ilde{ ilde{A}}$	<pre>\Tilde{\Tilde{A}}</pre>	$ec{ec{A}}$	$\Vec{\Vec{A}}$

10 Array environment, examples

 $\operatorname{begin{array}\{\mathit{cols}\}\ \mathit{row}_1 \setminus \mathit{row}_2 \setminus \ldots \mathit{row}_m}$ Simplest version: where cols includes one character [lrc] 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-frac5{12} \\ 3\psi & \frac{\pi}8 \end{array} \right) \left(\begin{array}{c} x \\ y \end{array} \right) \mbox{~and~} \left[\begin{array}{cc|r} 3 & 4 & 5 \\ 1 & 3 & 729 \end{array} \right]

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

\left\{ \begin{array}{rcl} \overline{\overline{z^2}+\cos z} & \mbox{for} & $|z| < 3 \setminus 0$ & \mbox{for} & $3 \leq z \leq 1$ $\sin\operatorname{verline}\{z\} \ \& \mbox\{for\} \ \& \ |z| > 5$ \end{array}\right.

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

11 Other Styles (math mode only)

Caligraphic letters: $\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$

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

Mathfrak letters: \$\mathfrak{A}\$ etc.: ABCDEFGHTJRLMNOPQRGTUVWXYJabc123

Math Sans serif letters: \$\mathsf{A}\\$ etc.: ABCDEFGHIJKLMNOPQRSTUVWXYZabc123

Math bold italic letters: define \def\mathbi#1{\textbf{\em #1}} then use \$\mathbi{A}\$ etc.: ABCDEFGHIJKLMNOPQRSTUVWXYZ abc 123

12 Font sizes

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

 ${\text {\rm f}^{-1}(x-x_a)\,,dx}$ ${\left(-1\right) (x-x_a)\,dx}$ ${\c f^{-1}(x-x_a)\,dx}$

 ${\sigma^{-1}(x-x_a)\,dx}$

Text Mode:

 $\forall tiny = smallest$ \scriptsize = very small $\footnotesize = smaller$

\Large = Large VLARGE = LARGE

normalsize = normal

\huge = huge Huge = Huge

Text Mode: Accents and Symbols 13

 $\sl = small$

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