3.9 List of Mathematical Symbols

In the following tables you find all the symbols normally accessible from *math mode*.

To use the symbols listed in Tables $3.12–3.16^5$, the package amssymb must be loaded in the preamble of the document and the AMS math fonts must be installed on the system. If the AMS package and fonts are not installed, on your system, have a look at

CTAN:/tex-archive/macros/latex/packages/amslatex

Table 3.1: Math Mode Accents

\hat{a}	\hat{a}	\check{a}	\check{a}	\tilde{a}	\tilde{a}	\acute{a}	\acute{a}
\grave{a}	\grave{a}	\dot{a}	\dot{a}	\ddot{a}	\ddot{a}	$reve{a}$	\breve{a}
\bar{a}	\bar{a}	\vec{a}	\vec{a}	\widehat{A}	\widehat{A}	\widetilde{A}	\widetilde{A}

Table 3.2: Lowercase Greek Letters

α	\alpha	θ	\theta	o	0	v	υ
β	\beta	ϑ	\vartheta	π	\pi	ϕ	\phi
γ	\gamma	ι	\iota	ϖ	\varpi	φ	\varphi
δ	\delta	κ	\kappa	ρ	\rho	χ	\chi
ϵ	\epsilon	λ	\lambda	ϱ	\varrho	ψ	\psi
ε	$\vert varepsilon$	μ	\mu	σ	\sigma	ω	\omega
ζ	\zeta	ν	\nu	ς	\varsigma		
η	\eta	ξ	\xi	au	\tau		

Table 3.3: Uppercase Greek Letters

Γ	\Gamma	Λ	\Lambda	\sum	\Sigma	Ψ	\Psi
Δ	\Delta	Ξ	\Xi	Υ	\Upsilon	Ω	\Omega
Θ	\Theta	П	\Pi	Φ	\Phi		

 $^{^5}$ These tables were derived from symbols.tex by David Carlisle and subsequently changed extensively as suggested by Josef Tkadlec

Table 3.4: Binary Relations

You can produce corresponding negations by adding a \not command as prefix to the following symbols.

<	<	>	>	=	=
\leq	$\leq or \leq o$	\geq	\geq or \ge	≡	\equiv
\ll	\11	\gg	\gg	÷	\doteq
\prec	\prec	\succ	\succ	\sim	\sim
\preceq	\preceq	\succeq	\succeq	\simeq	\simeq
\subset	\subset	\supset	\supset	\approx	\approx
\subseteq	\subseteq	\supseteq	\supseteq	\cong	\cong
	\sqsubset a		\sqsupset a	\bowtie	$\$ Join a
	\sqsubseteq	\supseteq	\sqsupseteq	\bowtie	\bowtie
\in	\in	\ni	\ni , \owns	\propto	\propto
\vdash	\vdash	\dashv	\dashv	=	\models
	\mid		\parallel	\perp	\perp
\smile	\smile	$\overline{}$	\frown	\asymp	\asymp
:	:	∉	\n	\neq	\neq or \ne

 $[^]a\mathrm{Use}$ the latexsym package to access this symbol

Table 3.5: Binary Operators

+	+	_	_		
\pm	\pm	干	\mp	◁	\triangleleft
•	\cdot	÷	\div	\triangleright	\triangleright
×	\times	\	\setminus	*	\star
\cup	\cup	\cap	\cap	*	\ast
	\sqcup	П	\sqcap	0	\circ
\vee	\ve , \lor	\wedge	\wedge , \label{land}	•	\bullet
\oplus	\oplus	\ominus	\ominus	\Diamond	\diamond
\odot	\odot	\oslash	\oslash	\forall	\uplus
\otimes	\otimes	\bigcirc	\bigcirc	П	\amalg
\triangle	$\$ bigtriangleup	∇	\bigtriangledown	†	\dagger
\triangleleft	\backslash lhd a	\triangleright	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	‡	\ddagger
\leq	\unlhd a	\trianglerighteq	\unrhd a	?	\wr

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

Table 3.7: Arrows

\leftarrow	\leftarrow or \gets		$\label{longleftarrow}$	\uparrow	\uparrow
\longrightarrow	\rightarrow or \to	\longrightarrow	$\label{longright} \$	\downarrow	\downarrow
\longleftrightarrow	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	\longleftrightarrow	$\label{longleftright} \$	\uparrow	\updownarrow
\Leftarrow	\Leftarrow	\Leftarrow	\Longleftarrow	\uparrow	\Uparrow
\Rightarrow	\Rightarrow	\Longrightarrow	\Longrightarrow	\Downarrow	\Downarrow
\Leftrightarrow	\Leftrightarrow	\iff	\Longleftrightarrow	\$	\Updownarrow
\mapsto	\mapsto	\longmapsto	$\label{longmapsto} \$	7	\nearrow
\longleftrightarrow	\h	\hookrightarrow	\h ookrightarrow	>	\searrow
_	\leftharpoonup	\rightarrow	\rightharpoonup	/	\swarrow
$\overline{}$	\leftharpoondown	$\overline{}$	\rightharpoondown	_	\nwarrow
\rightleftharpoons	\rightleftharpoons	\iff	\iff (bigger spaces)	\rightsquigarrow	$\$ leadsto a

 $[^]a\mathrm{Use}$ the latexsym package to access this symbol

Table 3.8: Delimiters

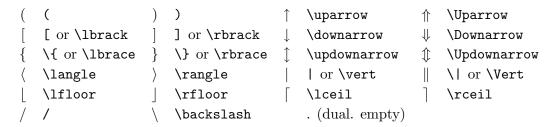


Table 3.9: Large Delimiters

(\lgroup	\rgroup	$\left(\begin{array}{c} \left(\begin{array}{c} \left($	\rmoustache
ĺ	\arrowvert	\Arrowvert	\bracevert	

		Table	3.10: Miscellar	neous	Symbols		
	\dots		\cdots	:	\vdots	٠.	\ddots
\hbar	\hbar	\imath	$\$ imath	J	\jmath	ℓ	\ell
\Re	\Re	\Im	\Im	×	\aleph	\wp	\wp
\forall	\forall	\exists	\exists	Ω	\mho a	∂	\partial
,	,	1	\prime	Ø	\emptyset	∞	$\$
∇	\nabla	\triangle	\triangle		ackbox^a	\Diamond	$\$ Diamond a
\perp	\bot	T	\top	_	\angle		\surd
\Diamond	\diamondsuit	\Diamond	\heartsuit	4	\clubsuit	\spadesuit	\spadesuit
\neg	\neg or \lnot	b	\flat	Ц	\natural	#	\sharp
	$^{a}\mathrm{Us}$	se the la	ntexsym package t	o acce	ss this symbol		

Table 3.11: Non-Mathematical Symbols

These symbols can also be used in text mode.

† \dag \{ \script \corporaght \} \\ \pounds

Table 3.12: AMS Delimiters

Table 3.12: AMS Delimiters

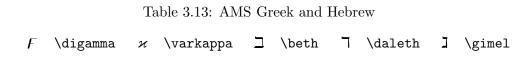


Table 3.14: AMS Binary Relations

<	\lessdot	>	\gtrdot	÷	\doteqdot or \Doteq
\leq	\leqslant	\geqslant	\geqslant	=	\rightarrow risingdotseq
<	\eqslantless	≽	\eqslantgtr	=	$\fill \$
\leq	\leqq	\geq	\geqq	<u> </u>	\eqcirc
///	\label{liless}	>>>	\ggg or \gggtr	<u>•</u>	\circeq
\lesssim	\lesssim	\gtrsim	\gtrsim	\triangleq	\triangleq
≲	\lessapprox		\gtrapprox	<u></u>	\bumpeq
	\lessgtr	\!\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	\gtrless	≎	\Bumpeq
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	\lesseqgtr	>	\gtreqless	~	\thicksim
\leq	\lesseqqgtr	>	\gtreqqless	\approx	\thickapprox
$\stackrel{\frown}{\preccurlyeq}$	\preccurlyeq	≽	\succcurlyeq	\approx	\approxeq
\curlyeqprec	\curlyeqprec	$\not\simeq$	\curlyeqsucc	\sim	\backsim
\preceq	\precsim	\succeq	\succsim	\geq	\backsimeq
≾≋	\precapprox		\succapprox	⊨	\vDash
\subseteq	\subseteqq	⊪∪≋Y	\supseteqq	IH	\Vdash
€	\Subset	∋	\Supset	III	\Vvdash
	\sqsubset	\Box	\sqsupset	€	\backepsilon
<i>:</i> .	\therefore	•••	\because	\propto	\varpropto
I	\shortmid	П	\shortparallel	Ŏ	\between
\smile	\smallsmile	$\overline{}$	\smallfrown	ф	\pitchfork
\triangleleft	\vartriangleleft	\triangleright	$\$ vartriangleright	•	$\blue{blacktriangleleft}$
⊴	\trianglelefteq	\trianglerighteq	$\$ trianglerighteq	•	\blacktriangleright

Table 3.15: AMS Arrows

←	\dashleftarrow	→	\d	⊸	$\mbox{\tt multimap}$
otin oti	\leftleftarrows	\Rightarrow	\rightrightarrows	$\uparrow\uparrow$	\upuparrows
$\stackrel{\longleftarrow}{\longrightarrow}$	\leftrightarrows	ightleftarrows	\rightleftarrows	$\downarrow \downarrow$	\downdownarrows
\Leftarrow	\Lleftarrow	\Rightarrow	\Rrightarrow	1	\upharpoonleft
₩	\twoheadleftarrow	\longrightarrow	\t twoheadrightarrow	1	\upharpoonright
\longleftrightarrow	\leftarrowtail	\longrightarrow	\rightarrowtail	1	\downharpoonleft
\leftrightharpoons	$\label{leftrightharpoons}$	\rightleftharpoons	\rightleftharpoons	ļ	\downharpoonright
Ħ	\Lsh	Ļ	\Rsh	~ →	\rightsquigarrow
\leftarrow P	\looparrowleft	\hookrightarrow	$\label{looparrowright}$	~~	\leftrightsquigarrow
$ \leftarrow $	\curvearrowleft	\Diamond	\curvearrowright		
Q	\circlearrowleft	\bigcirc	\circlearrowright		

Table 3.16: AMS Negated Binary Relations and Arrows

≮	\nless	*	\ngtr	≨	\varsubsetneqq
≨	\lneq	\geq	\gneq	⊋	\varsupsetneqq
≰	\nleq	≱	\ngeq	⊈	\nsubseteqq
≰	\nleqslant	$\not\geq$	\ngeqslant	$\not\supseteq$	\nsupseteqq
≨	\lneqq	\geq	\gneqq	1	\nmid
$\stackrel{\leq}{=}$	\lvertneqq	≩	\gvertneqq	#	\nparallel
≨≰	\nleqq	≱	\ngeqq	ł	\nshortmid
⋦	\label{lnsim}		\gnsim	łł	\nshortparallel
≨	\lnapprox	^∻ ^≉	\gnapprox	~	\nsim
\star	\nprec	¥	\nsucc	\ncong	\ncong
\npreceq	\npreceq	$\not\succeq$	\nsucceq	$\not\vdash$	\nvdash
$\not\equiv$	\precneqq	⊭	\succneqq	¥	\nvDash
$\not \gtrsim$	\precnsim	≻ ≯	\succnsim	\mathbb{H}	\nVdash
∕ ≋	\precnapprox	£	\succnapprox	⊭	\nVDash
\subsetneq	\subsetneq	\supseteq	\supsetneq		\ntriangleleft
⊊	\varsubsetneq	\supseteq	$\vert var supset neq$	\not	\ntriangleright
⊈	\nsubseteq	⊉	\nsupseteq	⊉	\ntrianglelefteq
\subseteq	\subsetneqq	\supseteq	\supsetneqq	$\not\trianglerighteq$	\ntrianglerighteq
↔	\nleftarrow	$\rightarrow \rightarrow$	\nrightarrow	$\leftrightarrow \rightarrow$	\nleftrightarrow
#	\nLeftarrow	*	\n	#	\n

Table 3.17: AMS Binary Operators

÷	\dotplus		\centerdot	Т	\intercal
K	\ltimes	×	\rtimes	*	\divideontimes
U	\Cup or \doublecup	$ \ \ \bigcap$	\Cap or \doublecap	\	\smallsetminus
\underline{V}	\veebar	$\overline{\wedge}$	\barwedge	_	\doublebarwedge
\blacksquare	\boxplus		\boxminus	Θ	\circleddash
\boxtimes	\boxtimes	$\overline{}$	\boxdot	0	\circledcirc
λ	\leftthreetimes	/	\rightthreetimes	*	\circledast
Υ	\curlyvee	人	\curlywedge		

Table 3.18: AMS Miscellaneous

\hbar	\hbar	\hbar	\hslash	k	\Bbbk
	\square		\blacksquare	\odot	\circledS
Δ	$\$ vartriangle	A	\blacktriangle	C	\complement
∇	\triangledown	▼	$\blue{location}$	G	\Game
\Diamond	\lozenge	•	\blacklozenge	*	\bigstar
Z	\angle	4	\measuredangle	⋖	\sphericalangle
/	\diagup		\diagdown	1	\backprime
∄	\nexists	F	\Finv	Ø	$\vert varnothing$
\mathfrak{F}	\eth	Ω	\mho		

Table 3.19: Math Alphabets

Example	Command	Required package
ABCdef	\mathrm{ABCdef}	
ABCdef	\mathit{ABCdef}	
ABCdef	\mathnormal{ABCdef}	
\mathcal{ABC}	\mathcal{ABC}	
\mathscr{ABC}	\mathcal{ABC}	mathrsfs
\mathcal{ABC}	\mathcal{ABC}	eucal with option: mathcal or
	\mathscr{ABC}	eucal with option: mathscr
ABCdef	<pre>\mathfrak{ABCdef}</pre>	eufrak
\mathbb{ABC}	\mathbb{ABC}	amsfonts or amssymb