TeX-Math

1 Introduction

1.1 What is TeX-Math

TeX-Math defines the subset of LaTeX that is supported by EquationServer for .NET and SciWriter. It includes most of standard math commands and environments of LaTeX and AMS LaTeX.

2 Mathematical Expressions

2.1 Subscripts and Superscripts

Examples

	Syntax	Rendered
Superscript:	X^2	X^2
	X^{n+1}	X^{n+1}
	X^{n^{m+1}}	$X^{n^{m+1}}$
Subscript:	X_n	X_n
	X_{n+1}	X_{n+1}
Combined Sub and Superscript:	X_n^2	X_n^2
Preceding Sub and Superscript:	^1_2 X^3_4	${}_2^1X_4^3$

The prime symbol will automatically be superscripted:

	Syntax	Rendered
Derivative (Prime)	f'	f'
Second Derivative (Double Prime)	f''	f''
Third Derivative (Tripple Prime)	f'''	f'''
Fourth Derivative (Quadruple Prime)	f''''	f''''

2.2 Fractions

Examples

Syntax	Rendered	
	Display Style	Text Style
\frac 1 2	$\frac{1}{2}$	$\frac{1}{2}$
\frac{1}{1+X^2}	$\frac{1}{1+X^2}$	$\frac{1}{1+X^2}$

Display Style fractions inside a text style environment can be created with the **\dfrac** command.

Examples

Syntax	Rendered
\textstyle \dfrac {1}{1+X^2}	$\textstyle \dfrac {1}{1+X^2}$

Text Style fractions inside a display style environment can be created with the **\tfrac** command.

Examples

Syntax	Rendered
\displaystyle \tfrac {1}{1+X^2}	$\displaystyle \tfrac {1}{1+X^2}$

2.3 Binomial Coefficients

Examples

Syntax	Rendered	
	Display Style	Text Style
\binom 1 2	$\binom 1 2$	$\binom 1 2$
\binom {a}{b+c}	$\binom {a}{b+c}$	$\binom {a}{b+c}$

Display Style binomial coefficients inside a text style environment can be created with the **\dbinom** command.

Examples

Syntax	Rendered
\textstyle \dbinom {a}{b+c}	$\textstyle \dbinom {a}{b+c}$

Text Style binomial coefficients inside a display style environment can be created with

the **\tbinom** command.

Examples

Syntax	Rendered
\displaystyle \tbinom {a}{b+c}	$\displaystyle \tbinom{a}{b+c}$

2.4 Square Roots and n-th Roots

Examples

	Syntax	Rendered
Square Root:	\sqrt X	$\sqrt{X}$
	\sqrt{1+X^2}	$\sqrt{1+X^2}$
n-th Root:	\sqrt[3] X	$\sqrt[3]{X}$
	\sqrt[3]{1+X^2}	$\sqrt[3]{1+X^2}$

2.5 Functions

There are two types of functions:

1. Functions without limits, such as **\sin** (See 2.5.1)
2. Functions with limits, such as **\lim** (See 2.5.2)

2.5.1 Functions without Limits

Table 2.1: Functions without Limits

Syntax	Rendered	Syntax	Rendered
\arccos	arccos	\exp	exp
\arcsin	arcsin	\hom	hom
\arctan	arctan	\ker	ker
\arg	arg	\lg	lg
\cos	cos	\ln	ln
\cosh	cosh	\log	log
\cot	cot	\sec	sec
\coth	coth	\sin	sin
\csc	csc	\sinh	sinh
\deg	deg	\tan	tan
\dim	dim	\tanh	tanh

2.5.2 Functions with Limits

Table 2.2: Functions with Limits

Syntax	Rendered
\lim	lim
\liminf	lim inf
\limsup	lim sup
\min	min
\max	max
\inf	inf
\sup	sup
\gcd	gcd
\det	det
\Pr	Pr

2.6 Integral Signs, Sums and Other

Symbols that will be larger in display style (LaTeX: **\displaystyle)** than in text style

(LaTeX: **\textstyle)** are listed in table 2.3.

Table 2.3: Large Operators

Symbol	Syntax	Rendered	
		Display Style	Text Style
Integral:	\int	$\int$	$\int$
Double Integral:	\iint	$\iint$	$\iint$
Tripple Integral:	\iiint	$\iiint$	$\iiint$
Contour Integral:	\oint	$\oint$	$\oint$
Surface Integral:	\oiint	$\oiint$	$\oiint$
Clockwise Contour Integral:	\ointclockwise	$\ointclockwise$	$\ointclockwise$
Anticlockwise Contour Integral:	\ointctrclockwise	$\ointctrclockwise$	$\ointctrclockwise$
Summation:	\sum	$\sum$	$\sum$
Product:	\prod	$\prod$	$\prod$
Coproduct:	\coprod	$\coprod$	$\coprod$
Intersection:	\bigcap	$\bigcap$	$\bigcap$
Union:	\bigcup	$\bigcup$	$\bigcup$
Disjunction:	\bigvee	$\bigvee$	$\bigvee$
Conjunction:	\bigwedge	$\bigwedge$	$\bigwedge$
Square Union:	\bigsqcup	$\bigsqcup$	$\bigsqcup$
Plus in U:	\biguplus	$\biguplus$	$\biguplus$
Circled Dot:	\bigodot	$\bigodot$	$\bigodot$
Circled Plus:	\bigoplus	$\bigoplus$	$\bigoplus$
Circled Times:	\bigotimes	$\bigotimes$	$\bigotimes$

2.7 Lower And Upper Limits

The large operators (such as integral signs, sums and other), as defined in section 2.6, as well as the mathematical functions with limits, as defined in section 2.5.2, can optionally have upper and/or lower limits. Those optional limits can be specified with "**^**" (Superscript) and "_" (Subscript) respectively. In display mode, these limits will be shown above and below the operator symbol. In text mode however these limits will be shown as superscripts and subscripts.

Examples

	Syntax	Rendered
Display Style:	\displaystyle \sum_{n=1}^{10}	$\displaystyle\sum_{n=0}^{100}$
Text Style:	\textstyle \sum_{n=1}^{10}	$\textstyle\sum_{n=0}^{10}$

Use the **\nolimits** command if you wish to show the limits of large operators (or functions with limits) as subscripts and superscripts in display style.

Examples

Syntax	Rendered
\displaystyle \sum\nolimits_{n}	$\displaystyle\sum\nolimits_{n=0}^{100}$

Use the **\limits** command if you wish to show the limits of large operators below and above the operator symbol in text style.

Examples

Syntax	Rendered
\textstyle \sum\limits_{n}	$\textstyle\sum\limits_{n=0}^{100}$

2.7.1 Multiline Limits

Large operators sometimes need multiline limits, which can be typeset with the **\substack** command. The command **** is used to separate lines inside the stack.

Examples

Syntax	Rendered
\sum_{\substack{i<n \\ j> m}} X_{i,j}	$\sum_{\substack{i<n \\ j>m}} X_{i,j}$

The lines are centered by **\substack** command. To get multiline limits with left aligned lines you can use the subarray environment.

Examples

Syntax	Rendered
\sum_{\begin{subarray}{l} i<n \\ j> m \end{subarray}} X_{i,j}	$\sum_{\begin{subarray}{l} i<n \\ j>m \end{subarray}} X_{i,j}$

2.8 Stacking Symbols

Examples

Syntax	Rendered
\overset{X}{\alpha}	$\overset{X}{\alpha}$
\underset{X}{n}	$\underset{X}{n}$

2.9 Delimiters

Table 2.4: Delimiters

Name	Syntax	Rendered
left parenthesis	(	(
right parenthesis	)	)
left bracket	[(or \lbrack)	[
right bracket	] (or \rbrack)	]
left brace	\{ (or \lbrace)	{
right brace	\} (or \rbrace)	}
left angle bracket	\langle	<
right angle braket	\rangle	>
vertical line	| (or \vert)	|
double vertical line	\\| (or \Vert)	||
left floor	\lfloor	⌊
right floor	\rfloor	⌋
left ceiling	\lceil	⌈
right ceiling	\rceil	⌉
up arrow	\uparrow	↑
down arrow	\downarrow	↓
up and down arrow	\updownarrow	↕

2.9.1 Delimiters of Variable Size

Using the commands **\left** and **\right** in combination with delimiters chosen from table 2.4 it is possible to construct a pair of delimiters of variable size (stretchy).

Examples

Syntax	Rendered
\left(\frac {1a+b}{2} \right)	$\left(\frac{a+b}{2} \right)$
{ \left[\frac{x^2+1}{a}\right] }^2	$\left[\frac{x^2+1}{a} \right]^2$

2.9.2 Delimiters of Fixed Size

Using the commands **\big**, **\Big**, **\bigg** and **\Bigg** in combination with a delimiter chosen from table 2.4 it is possible to produce delimiters of a larger size than the standard size.

Examples

Syntax	Rendered
(\big(\Big(\bigg(\Bigg(	
\Bigg\langle \Bigg\lfloor	

2.10 Math Accents

Table 2.5: Accents

Syntax	Rendered
\acute{a}	$\acute{a}$
\bar{a}	$\bar{a}$
\breve{a}	$\breve{a}$
\check{a}	$\check{a}$
\grave{a}	$\grave{a}$
\hat{a}	$\hat{a}$
\mathring{a}	$\mathring{a}$
\tilde{a}	$\tilde{a}$
\vec{a}	$\vec{a}$
\dot{a}	$\dot{a}$
\ddot{a}	$\ddot{a}$
\dddot{a}	$\dddot{a}$
\ddddot{a}	$\ddddot{a}$
\widehat{a}	$\widehat{ABC}$
\widetilde{a}	$\widetilde{a}$

2.11 Stretchable Horizontal Lines

2.11.1 Horizontal Braces

Examples

Syntax	Rendered
\overbrace{a+b+\cdots+z}	$\overbrace{a+b+\cdots+z}$
\overbrace{a+b+\cdots+z}^n	$\overbrace{a+b+\cdots+z}^{n}$
\underbrace{a+b+\cdots+z}	$\underbrace{a+b+\cdots+z}$
\underbrace{a+b+\cdots+z}^n	$\underbrace{a+b+\cdots+z}_{n}$

2.11.2 Overlines and Underlines

Examples

Syntax	Rendered
\overline{ABC}	$\overline{ABC}$
\overrightarrow{ABC}	$\overrightarrow{ABC}$
\overleftarrow{ABC}	$\overleftarrow{ABC}$
\overleftrightarrow{ABC}	$\overleftrightarrow{ABC}$
\underline{ABC}	$\underline{ABC}$
\underrightarrow{ABC}	$\underrightarrow{ABC}$
\underleftarrow{ABC}	$\underleftarrow{ABC}$
\underleftrightarrow{ABC}	$\underleftrightarrow{ABC}$

2.11.3 Stretchable Arrows

Examples

Syntax	Rendered
A \xrightarrow{Textabove} B	$A \xrightarrow{\text{Text above}} B$
A \xleftarrow{Textabove} B	$A \xleftarrow{\text{Text above}} B$
A \xleftrightarrow{Textabove} B	$A \xleftrightarrow{\text{Text above}} B$
A \xleftrightarrows{Textabove} B	$A \xleftrightarrows{\text{Text above}} B$
A \xrightleftarrows{Textabove} B	$A \xrightleftarrows{\text{Text above}} B$

Examples

Syntax	Rendered
A \xrightarrow[Text below]{Textabove} B	$A \xrightarrow[\text{Text below}]{\text{Text above}} B$
A \xleftarrow[Text below]{Textabove} B	$A \xleftarrow[\text{Text below}]{\text{Text above}} B$
A \xleftrightarrow[Text below]{Textabove} B	$A \xleftrightarrow[\text{Text below}]{\text{Text above}} B$
A \xleftrightarrows[Text below]{Textabove} B	$A \xleftrightarrows[\text{Text below}]{\text{Tetx above}} B$
A \xrightleftarrows[Text below]{Textabove} B	$A \xrightleftarrows[\text{Text below}]{\text{Text above}} B$

3 Text in Math

Text inside math environment can be included with the \mbox or \text command.

Examples

Syntax	Rendered
X+\text{Text}+Y	$X + \text{Text} + Y$
A=\{x \mid \mbox{for x large} \}	$A = \{x \mid \text{for } x \text{ large}\}$

To use one of the special characters **&**, **$**, **{**, **}**, **_**, **#**, **^**, **~** or **%** in a text

environment it is required to type a backslash before the symbol.

Name	Syntax	Rendered
Ampersand	\text{ \& }	&
Caret	\text{ \^{} }	^
Dollar Sign	\text{ \$ }	$
Left Brace	\text{ \{ }	{
Right Brace	\text{ \} }	}
Underscore	\text{ _ }	_
Octothorp	\text{ \# }	#
Percent	\text{ \% }	%
Tilde	\text{ \~{}}	~

4 Spacing Commands

Table 4.1: Spacing Commands

Syntax	Space Width
\,	1/6 em
\:	2/9 em
\;	5/18 em
\thinspace	1/6 em
\medspace	2/9 em
\thickspace	5/18 em
\quad	1 em
\qquad	2 em
\!	-1/6 em
\negthinspace	-1/6 em
\negmedspace	- 2/9 em
\negthickspace	- 5/18 em

4.1 The "phantom" Command

The **\phantom** command produces a space in a formula equivalent to the space that would be occupied by its typeset argument.

Examples

Syntax	Rendered
A++C	$A++C$
\binom{1}{-2}	$\binom{1}{-2}$

5 Font Style and Font Size

5.1 Font Size

Table 5.1 shows the commands that can be used to change the font size directly.

Table 5.1: Font Size Commands

Syntax	Rendered
\tiny \text{Sample Text}	Sample Text
\scriptsize \text{Sample Text}	Sample Text
\footnotesize \text{Sample Text}	Sample Text
\small \text{Sample Text}	Sample Text
\normalsize \text{Sample Text}	Sample Text
\large \text{Sample Text}	Sample Text
\Large \text{Sample Text}	Sample Text
\huge \text{Sample Text}	Sample Text
\Huge \text{Sample Text}	Sample Text

Additionally there are the commands listed in table 5.2 which change the style parameters *display style* and the *script level* of an expression.

Table 5.2: Font Size Commands

Syntax	Rendered	Display Style	Script Level
\displaystyle	$X^2 + \frac{x^2}{2}$	Displayed	0
\textstyle	$X^2 + \frac{x^2}{2}$	Inline	0
\scriptstyle	$X^2 + \frac{x^2}{2}$	Inline	1
\scriptscriptstyle	$X^2 + \frac{x^2}{2}$	Inline	2

5.2 Font Style (Font Families)

	Syntax	Rendered
math bold	\mathbf{a}	$\mathbf{A}$
math italic	\mathit{a}	A
math normal	\mathnormal{a}	A
math bold italic	\boldsymbol{a}	$\boldsymbol{A}$
math sans serif	\mathsf{a}	A
math roman	\mathrm{a}	A
math typewriter	\mathtt{a}	$\mathtt{A}$
math calligraphic	\mathcal{A}	$\mathcal{A}$
math fraktur	\mathfrak{A}	$\mathfrak{A}$
math blackboard bold	\mathbb{A}	$\mathbb{A}$

6 Arrays and Matricies

6.1 Matricies

The **matrix** environment creates a matrix with centered table cells.

Examples

Syntax	Rendered
begin{matrix}X_11 & X_12 \\ X_12 X_22 \end{matrix}	$X_{11}\quad X_{12}$ $X_{21}\quad X_{22}$

The **array** environment allows to define the column alignment (l= left aligned, c= centered, r = right aligned) and to insert vertical column lines in a second argument. Horizontal lines between rows can be inserted with the **\hline** command.

Examples

Syntax	Rendered
\begin{array}{lr} a+b & c+d \\ e & f\end{array}	$a+b \quad c+d$ $e \qquad\quad f$
\begin{array}{c|c} a & b \\ c & d\end{array}	$\begin{array}{c\|c} a & b \\ \hline c & d \end{array}$
\begin{array}{c|cc} a & b & c\\ \hline d & e & f\\ g & h & i\end{array}	$\begin{array}{c\|cc} a & b & c \\ \hline d & e & f \\ g & h & i \end{array}$

6.2 Matrix Variants

The environments **pmatrix, bmatrix**, **Bmatrrix**, **vmatrix** and **Vmatrix** create a matrix with surrounding delimiters as shown in table 6.1.

Table 6.1: Matrix Commands

	Syntax	Rendered
pmatrix	\begin{pmatrix}X_11 & X_12 \\ X_12 X_22 \end{matrix}	$\begin{pmatrix} X_{11} & X_{12} \\ X_{21} & X_{22} \end{pmatrix}$
bmatrix	\begin{bmatrix}X_11 & X_12 \\ X_12 X_22 \end{bmatrix}	$\begin{bmatrix} X_{11} & X_{12} \\ X_{21} & X_{22} \end{bmatrix}$
Bmatrix	\begin{Bmatrix}X_11 & X_12 \\ X_12 X_22 \end{Bmatrix}	$\begin{Bmatrix} X_{11} & X_{12} \\ X_{21} & X_{22} \end{Bmatrix}$
vmatrix	\begin{vmatrix}X_11 & X_12 \\ X_12 X_22 \end{vmatrix}	$\begin{vmatrix} X_{11} & X_{12} \\ X_{21} & X_{22} \end{vmatrix}$
Vmatrix	\begin{Vmatrix}X_11 & X_12 \\ X_12 X_22 \end{Vmatrix}	$\begin{Vmatrix} X_{11} & X_{12} \\ X_{21} & X_{22} \end{Vmatrix}$

6.3 Cases

The **cases** environment produces an matrix with left aligned columns and a left brace of variable size.

Examples

Syntax
f(x)=\begin{cases}-x^2, &\text{if $x<0$;}\\ \alpha+x, &\text{if $0\leq x\leq1$;};\\x^2

7 Multiline Environment

The multiline environment can be used to create multiline equations.

Examples

Syntax	Rendered
\begin{multiline}Y&=&A+B\\&=&C\end{multiline}	$Y = A + B$ $= C$

8 Mathematical Symbols

Hebrew Letters

LaTeX		LaTeX	
\aleph	א	\gimel	ג
\beth	ב	\daleth	ד

Greek Lowercase

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

Greek Uppercase

LaTeX		LaTeX	
\Gamma	Γ	\varPi	$\varPi$
\varGamma	$\varGamma$	\Sigma	Σ
\Delta	Δ	\varSigma	$\varSigma$
\varDelta	$\varDelta$	\Upsilon	Υ
\Theta	Θ	\varUpsilon	$\varUpsilon$
\varTheta	$\varTheta$	\Phi	Φ
\Lambda	Λ	\varPhi	$\varPhi$
\varLambda	$\varLambda$	\Psi	Ψ
\varXi	$\varXi$	\varPsi	$\varPsi$
\Xi	Ξ	\Omega	Ω
\Pi	Π	\varOmega	$\varOmega$

Binary Relations

LaTeX		LaTeX	
:	$:$	\gg	$\gg$
<	$<$	\prec	$\prec$
=	$=$	\succ	$\succ$
>	$>$	\subset	$\subset$
\in	$\in$	\supset	$\supset$
\ni	$\ni$	\subseteq	$\subseteq$
\owns	$\ni$	\supseteq	$\supseteq$
\propto	$\propto$	\sqsubset	$\sqsubset$
\mid	$\mid$	\sqsupset	$\sqsupset$
\parallel	$\parallel$	\sqsubseteq	$\sqsubseteq$
\sim	$\sim$	\sqsupseteq	$\sqsupseteq$
\eqsim	$\eqsim$	\vdash	$\vdash$
\simeq	$\simeq$	\dashv	$\dashv$
\cong	$\cong$	\perp	$\perp$
\approx	$\approx$	\models	$\models$
\asymp	$\asymp$	\bowtie	$\bowtie$
\doteq	$\doteq$	\Join	$\Join$
\equiv	$\equiv$	\frown	$\frown$
\le	$\le$	\smallfrown	$\smallfrown$
\leq	$\leq$	\smallsmile	$\smallsmile$
\ge	$\ge$	\smile	$\smile$
\geq	$\geq$	\preceq	$\preceq$
\ll	$\ll$	\succeq	$\succeq$

AMS Binary Relations

LaTeX		LaTeX	
\backepsilon	϶	\Vvdash	⊪
\varpropto	∝	\vartriangleleft	◁
\shortmid	∣	\vartriangleright	▷
\shortparallel	∥	\trianglelefteq	⊴
\therefore	∴	\trianglerighteq	⊵
\because	∵	\backsimeq	⋍
\thicksim	∼	\Subset	⋐
\backsim	∽	\Supset	⋑
\thickapprox	≈	\pitchfork	⋔
\approxeq	≊	\lessdot	⋖
\Bumpeq	≎	\gtrdot	⋗
\bumpeq	≏	\lll	⋘
\doteqdot	≑	\ggg	⋙
\fallingdotseq	≒	\lesseqgtr	⋚
\risingdotseq	≓	\gtreqless	⋛
\eqcirc	≖	\curlyeqprec	⋞
\circeq	≗	\curlyeqsucc	⋟
\triangleq	≜	\blacktriangleright	▶
\leqq	≦	\blacktriangleleft	◀
\geqq	≧	\leqslant	⩽
\between	≬	\geqslant	⩾
\lesssim	≲	\lessapprox	⪅
\gtrsim	≳	\gtrapprox	⪆
\lessgtr	≶	\lesseqqgtr	⪋
\gtrless	≷	\gtreqqless	⪌
\preccurlyeq	≼	\eqslantless	⪕
\succcurlyeq	≽	\eqslantgtr	⪖
\precsim	≾	\precapprox	⪷
\succsim	≿	\succapprox	⪸
\vDash	⊨	\subseteqq	⫅
\Vdash	⊩	\supseteqq	⫆

Negated Binary Relations

LaTeX		LaTeX	
\notin	$\notin$	\nsupseteq	$\not\supseteq$
\not\ni	$\not\ni$	\subsetneq	$\subsetneq$
\nmid	$\nmid$	\varsubsetneq	$\varsubsetneq$
\nshortmid	$\nshortmid$	\supsetneq	$\supsetneq$
\nparallel	$\nparallel$	\varsupsetneq	$\varsupsetneq$
\nshortparallel	$\nshortparallel$	\nvdash	$\nvdash$
\nsim	$\nsim$	\nvDash	$\nvDash$
\not\simeq	$\not\simeq$	\lnsim	$\lnsim$
\ncong	$\ncong$	\gnsim	$\gnsim$
\not\approx	$\not\approx$	\precnsim	$\precnsim$
\ne	$\ne$	\succnsim	$\succnsim$
\neq	$\neq$	\ntriangleleft	$\ntriangleleft$
\not\equiv	$\not\equiv$	\ntriangleright	$\ntriangleright$
\nleqq	$\nleqq$	\ntrianglelefteq	$\ntrianglelefteq$
\ngeqq	$\ngeqq$	\ntrianglerighteq	$\ntrianglerighteq$
\lneqq	$\lneqq$	\nleqslant	$\nleqslant$
\lvertneqq	$\lvertneqq$	\ngeqslant	$\ngeqslant$
\gneqq	$\gneqq$	\lneq	$\lneq$
\gvertneqq	$\gvertneqq$	\gneq	$\gneq$
\not\asymp	$\not\asymp$	\lnapprox	$\lnapprox$
\nless	$\nless$	\gnapprox	$\gnapprox$
\ngtr	$\ngtr$	\npreceq	$\npreceq$
\nleq	$\nleq$	\nsucceq	$\nsucceq$
\ngeq	$\ngeq$	\precneqq	$\precneqq$
\not\lesssim	$\not\lesssim$	\succneqq	$\succneqq$
\not\gtrsim	$\not\gtrsim$	\precnapprox	$\precnapprox$
\not\lessgtr	$\not\lessgtr$	\succnapprox	$\succnapprox$
\not\gtrless	$\not\gtrless$	\nsubseteqq	$\nsubseteqq$
\nprec	$\nprec$	\nsupseteqq	$\nsupseteqq$
\nsucc	$\nsucc$	\subsetneqq	$\subsetneqq$
\not\subset	$\not\subset$	\varsubsetneqq	$\varsubsetneqq$
\not\supset	$\not\supset$	\supsetneqq	$\supsetneqq$
\nsubseteq	$\nsubseteq$	\varsupsetneqq	$\varsupsetneqq$

Binary Operators

LaTeX		LaTeX	
\And	&	\circleddash	⊝
*	*	\boxplus	⊞
+	+	\boxminus	⊟
\pm	±	\boxtimes	⊠
\centerdot	·	\lhd	◁
\times	×	\rhd	▷
\div	÷	\unlhd	⊴
\dagger	†	\unrhd	⊵
\ddagger	‡	\veebar	⊻
\bullet	•	\diamond	◊
-	−	\cdot	·
\mp	∓	\star	⋆
\dotplus	∔	\divideontimes	⋇
\setminus	\	\ltimes	⋉
\smallsetminus	∖	\rtimes	⋊
\ast	*	\leftthreetimes	⋋
\circ	∘	\rightthreetimes	⋌
\land	∧	\curlyvee	⋎
\wedge	∧	\curlywedge	⋏
\lor	∨	\Cap	⋒
\vee	∨	\doublecap	⋒
\cap	∩	\Cup	⋓
\cup	∪	\doublecup	⋓
\wr	≀	\barwedge	⊼
\uplus	⊎	\doublebarwedge	⩞
\sqcap	⊓	\bigtriangleup	△
\sqcup	⊔	\vartriangle	△
\oplus	⊕	\triangleright	▷
\ominus	⊖	\bigtriangledown	▽
\otimes	⊗	\triangleleft	◁
\oslash	⊘	\bigcirc	○
\odot	⊙	\obar	⊶
\circledcirc	⊚	\amalg	⨿

Arrows

LaTeX		LaTeX	
\leftarrow	$\leftarrow$	\uparrow\downarrow	$\updownarrow$
\uparrow	$\uparrow$	\Leftarrow	$\Leftarrow$
\rightarrow	$\rightarrow$	\Uparrow	$\Uparrow$
\to	$\to$	\Rightarrow	$\Rightarrow$
\downarrow	$\downarrow$	\Downarrow	$\Downarrow$
\leftrightarrow	$\leftrightarrow$	\iff	$\iff$
\updownarrow	$\updownarrow$	\Leftrightarrow	$\Leftrightarrow$
\nwarrow	$\nwarrow$	\Updownarrow	$\Updownarrow$
\nearrow	$\nearrow$	\Rightarrow	$\Rightarrow$
\searrow	$\searrow$	\leadsto	$\leadsto$
\swarrow	$\swarrow$	\downarrow\uparrow	$\downarrow\uparrow$
\mapsto	$\mapsto$	\longleftarrow	$\longleftarrow$
\hookleftarrow	$\hookleftarrow$	\longrightarrow	$\longrightarrow$
\hookrightarrow	$\hookrightarrow$	\longleftrightarrow	$\longleftrightarrow$
\leftharpoonup	$\leftharpoonup$	\Longleftarrow	$\Longleftarrow$
\leftharpoondown	$\leftharpoondown$	\Longrightarrow	$\Longrightarrow$
\rightharpoonup	$\rightharpoonup$	\Longleftrightarrow	$\Longleftrightarrow$
\rightharpoondown	$\rightharpoondown$	\longmapsto	$\longmapsto$

AMS Arrows

LaTeX		LaTeX	
\nleftarrow	$\nleftarrow$	\upharpoonleft	$\upharpoonleft$
\nrightarrow	$\nrightarrow$	\downharpoonright	$\downharpoonright$
\twoheadleftarrow	$\twoheadleftarrow$	\downharpoonleft	$\downharpoonleft$
\twoheadrightarrow	$\twoheadrightarrow$	\rightleftarrows	$\rightleftarrows$
\leftarrowtail	$\leftarrowtail$	\leftrightarrows	$\leftrightarrows$
\rightarrowtail	$\rightarrowtail$	\leftleftarrows	$\leftleftarrows$
\looparrowleft	$\looparrowleft$	\upuparrows	$\upuparrows$
\looparrowright	$\looparrowright$	\rightrightarrows	$\rightrightarrows$
\leftrightsquigarrow	$\leftrightsquigarrow$	\downdownarrows	$\downdownarrows$
\nleftrightarrow	$\nleftrightarrow$	\leftrightharpoons	$\leftrightharpoons$
\Lsh	$\Lsh$	\rightleftharpoons	$\rightleftharpoons$
\Rsh	$\Rsh$	\nLeftarrow	$\nLeftarrow$
\curvearrowleft	$\curvearrowleft$	\nLeftrightarrow	$\nLeftrightarrow$
\curvearrowright	$\curvearrowright$	\nRightarrow	$\nRightarrow$
\circlearrowleft	$\circlearrowleft$	\Lleftarrow	$\Lleftarrow$
\circlearrowright	$\circlearrowright$	\rightsquigarrow	$\rightsquigarrow$
\upharpoonright	$\upharpoonright$	\multimap	$\multimap$

Miscellaneous Symbols

LaTeX		LaTeX	
\jmath	j	\nabla	∇
\pounds	£	\surd	$\surd$
\yen	¥	\infty	∞
\S	§	\angle	$\angle$
\copyright	©	\measuredangle	$\measuredangle$
\lnot	¬	\sphericalangle	$\sphericalangle$
\neg	¬	\smallint	$\smallint$
\circledR	®	\top	$\top$
\P	¶	\bot	$\bot$
\eth	ð	\Diamond	$\Diamond$
\imath	$\imath$	\diamondsuit	$\diamondsuit$
\lambdabar	λ	\Box	$\Box$
\dag	†	\square	$\square$
\ddag	‡	\blacksquare	$\blacksquare$
\prime	′	\blacktriangle	$\blacktriangle$
\backprime	‵	\triangle	$\triangle$
\hbar	$\hbar$	\blacktriangledown	$\blacktriangledown$
\hslash	$\hbar$	\triangledown	$\triangledown$
\Im	$\Im$	\lozenge	$\lozenge$
\ell	ℓ	\bigstar	$\bigstar$
\wp	$\wp$	\spadesuit	$\spadesuit$
\Re	$\Re$	\clubsuit	$\clubsuit$
\mho	℧	\heartsuit	$\heartsuit$
\forall	∀	\flat	$\flat$
\complement	∁	\natural	$\natural$
\partial	∂	\sharp	$\sharp$
\exists	$\exists$	\checkmark	$\checkmark$
\nexists	$\nexists$	\maltese	✠
\emptyset	∅	\blacklozenge	$\blacklozenge$
\varnothing	∅	\Bbbk	k

Delimiters

LaTeX		LaTeX	
/	/	\Uparrow	⇑
\lbrack	[	\Downarrow	⇓
\backslash	\	\Updownarrow	⇕
\rbrack	]	\lceil	⌈
\lbrace	{	\rceil	⌉
|	‖	\lfloor	⌊
\vert	‖	\rfloor	⌋
\rbrace	}	\ulcorner	⌜
\\|	‖	\urcorner	⌝
\Vert	‖	\llcorner	⌞
\uparrow	↑	\lrcorner	⌟
\downarrow	↓	\langle	⟨
\updownarrow	↕	\rangle	⟩

Dots

LaTeX		LaTeX	
\colon	:	\cdots	⋯
\dots	…	\iddots	⋰
\ldots	…	\ddots	⋱
\vdots	⋮		

Escapable Special Characters

LaTeX		LaTeX	
\#	#	_	_
\$	$	\{	{
\%	%	\}	}
\&	&	\^	^