1 Operations

higher order roots	$\sqrt[mn]{x+y} \quad \sqrt[3]{2}$	`\sqrt[mn]{x+y} \quad \sqrt[3]{2}`
root sign	$\surd[x+y]$	`\surd[x+y]`
force large fraction	$\frac{a+b}{x+\log\dfrac{Y}{Z}}$	`\frac{a+b}{x+\log\dfrac{Y}{Z}}`
Continued fraction	$1+\cfrac{2}{3+\cfrac{4}{5+\cfrac{6}{7+\dotsb}}} = \frac{1}{\sqrt e - 1}$	`1+\cfrac{2}{ 3+\cfrac{4}{ 5+\cfrac{6}{7+\dotsb}}} = \frac{1}{\sqrt e - 1}`
prime	$y'' + y' + y = u$	`y'' + y' + y = u`
mod	$a \bmod n = b$ $a \equiv b \pmod n$ $a \equiv b \mod n$ $a \equiv b \pod n$	`\begin{array}{l} a\bmod n = b \\ a\equiv b\pmod n \\ a\equiv b\mod n \\ a\equiv b\pod n \end{array}`

2 Subscripts and superscripts

multilevel subscripts	$\sum_{\substack{1 \le m \le N, \\ m \text{ odd}}} P(m)$	`\sum_{\substack{ 1 \le m \le N, \\ m\text{ odd}}} P(m)`

sub- and superscripts before the symbol	${}_nC_k$	`{}_n C_k`
subscripts and superscripts for large symbols	${}_b^a\sum_c^\prime$	`\sideset{^a_b}{'_c}` `\sum`

3 Sums, integrals, and products

contour integral	$\oint_C$	`\oint_C`
double and triple integrals	$\iint_S \quad \iiint_S$	`\iint_S \quad \iiint_S`
even more integrals	$\iiiint_S \quad \int\cdots\int_S$	`\iiiint_S \quad \idotsint_S`
integrals with alternative limit placement	$\int\limits_\alpha^\beta \quad \iint\limits_S$	`\int\limits_\alpha^\beta \quad` `\iint\limits_S`
Unions and intersections	$\bigcup_{\alpha\in S} \quad \bigcap_{V\in\mathfrak{V}}$	`\bigcup_{\alpha\in S}\quad` `\bigcap_{V\in\mathfrak{V}}`

Direct sums, coproducts, and so on	$\bigodot \quad \bigoplus$
	$\bigotimes \quad \bigsqcup$
	$\biguplus \quad \coprod$
	$\bigvee \quad \bigwedge$
		`\begin{array}{c}`
		`\bigodot \quad \bigoplus\\`
		`\bigotimes \quad \bigsqcup\\`
		`\biguplus \quad \coprod\\`
		`\bigvee \quad \bigwedge\\`
		`\end{array}`

4 Brackets

pairing brackets	$( ), [ ], \{ \}$
	$\lvert \rvert, \lVert \rVert$
	$\lceil \rceil, \lfloor \rfloor$
	$\langle \rangle$
		`( \; ), [ \; ], \{ \; \}`
		`\lvert\;\rvert, \lVert\;\rVert`
		`\lceil\;\rceil, \lfloor\;\rfloor`

Bracket size can be specified explicitly	$\Biggl(\biggl(\Bigl(\bigl(\quad \Biggr\} \biggr\} \Bigr\} \bigr\}$	`\Biggl( \biggl( \Bigl( \bigl( \quad` `\Biggr\} \biggr\} \Bigr\} \bigr\}`

visually to large	$\left[\sum_j \left\lvert \sum_i x_{ij} \right\rvert^2 \right]^{1/2}$	`\left[ \sum_j`
		`  \left|\sum_i x_{ij}\right|^2`
		`\right]^{1/2}`

manually-sized	$\biggl[\sum_j \Bigl\lvert \sum_i x_{ij} \Bigr\rvert^2 \biggr]^{1/2}$	`\biggl[ \sum_j`
		`  \Bigl|\sum_i x_{ij}\Bigr|^2`
		`\biggr]^{1/2}`

5 Multiline formulas and piecewise functions

plecewise function/cases	$a_k = \begin{cases} k & \text{for } k \le n/2 \\ n & \text{for } k = n/2 \\ k-1 & \text{otherwise} \end{cases}$	`a_k = \begin{cases}`
		`  k & \text{for $k \le n/2$}\\`
		`  n & \text{for $k=n/2$}\\`
		`  k-1 & \text{otherwise}`

multiline equations	$\begin{aligned} \tan^2 x &= \sin^2 x / \cos^2 x \\ &= 1/\cos^2 x - 1 \end{aligned}$	`\begin{align*}\tan^2 x`
		`  &= \sin^2 x/\cos^2 x\\`
		`  &= 1/\cos^2 x - 1`
		`\end{align*}`

Systems of equations	$\left\{ \begin{array}{l} ax+by=r_1 \\ cx+dy=r_2 \end{array} \right.$	`\left\{\begin{array}{l}`
		`  ax+by=r_1\\`
		`  cx+dy=r_2`
		`\end{array}\right.`

6 Arrows

Implication	$x^2 = 4 \implies x = \pm 2$	`x^2=4 \implies x = \pm 2`
If and only if	$x^2 = 4 \iff x = \pm 2$	`x^2=4 \iff x = \pm 2`
Tends to	$x \to +\infty$	`x \to +\infty`

gets	$A \leftarrow B + C$
	$A \xleftarrow{\text{today}} B$
	$B \xrightarrow{\text{tomorrow}} C$
		`A\gets B+C`
		`A \xleftarrow{\rm today} B`
		`B\xrightarrow{\rm tomorrow}C`

Sizable single horizontal arrow	$C \xrightarrow[\text{(exception Fridays)}]{\text{every day}} D$	`C \xrightarrow`
		`[\text{(exception Fridays)}]`
		`{\text{every day}} D`

Sizeable single vertical arrows	$\left\uparrow \sum \right\downarrow \Big\updownarrow$	`\left\uparrow\sum \right\downarrow\;` `\Big\updownarrow`
Sizable double vertical arrows	$\left\Uparrow \sum \right\Downarrow \Big\Updownarrow$	`\left\Uparrow\sum \right\Downarrow \;` `\Big\Updownarrow`

7 Over and underbraces and other embellishments

overline	$\overline{A+B}$	`\overline{A+B}`
underline	$\underline{A+B}$	`\underline{A+B}`

Hat	$\widehat{A+B}$ `\widehat{A+B}`	
Tilde	$\widetilde{A+B}$	`\widetilde{A+B}`
Vector markers	$\overrightarrow{AB}$ and $\overleftarrow{BA}$	`\overrightarrow{AB}\text{ and }` `\overleftarrow{BA}`
' Overbrace	$\overbrace{x_1+x_2+\cdots+x_k}^{k \text{ in total}}$	`\overbrace(x_1+x_2+\cdots + x_k}^` `{k \text{ in total}}`
Underbrace	$m^n = \underbrace{m \cdot m \cdots m}_{n}$	`m^n = \underbrace{m\cdot m\cdots m}_{n}`
Affixing arbitrary symbols	$x \overset{?}{\ge} y$	`x\overset{?}{\ge}y`