

WWdoc/Math

the language of MonarchSuite™

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WWdoc is the language of MonarchSuite, a series of programs that WestWords envisions will act as the bridge where all math documents will cross and communicate. Because all coding languages will be converted to WWdoc, those files will easily move from word processor to paging programs. Files created in paging programs can be saved in WWdoc to reverse the process.

WestWords has created a new coding language that draws from the best of other coding structures (such as TeX, SGML, PowerMath, XML, and RTF). WWdoc/Math is robust, versatile, and very readable. It is also the language of the new PowerMath™ 4.0.

WWdoc is an exhaustive language which attempts to encompass all math structures from El-High to high level calculus.

reserved characters

WWdoc has reserved certain characters for special purposes as follows:

‘|’ to delimit Pi Character tags.

‘*’ to delimit Procedures tags.

‘~’ to delimit Style tags.

‘!’ to delimit Macro tags, and ‘\$’ to serve as merge codes for macros.

‘{ }’ to contain “arguments” to procedures and macros

‘[]’ to contain optional fields for procedures in some special cases, and ‘%’ as field separators therein.

examples

Pi Characters are accessed using the pipe keyboard stroke “|”. These pipes are matched. To key a normal pipe, WWdoc has created the tags “\|”.

Macro tags are accessed using the “exclamation point” keystroke “!”. These delimiters are matched.

To access procedures, WWdoc uses the asterisk keystroke “*”. These delimiters are matched. To key a normal asterisk, WWdoc has created the tag “*”

WWdoc has reserved the tilde keystroke “~” for Style changes. To key a normal tilde, WWdoc has created the tag “\~”. More commonly, a tilde is used as an accent. In that case, WWdoc has created the |Atil tag name which is mostly used in the accent procedure.

The argument delimiter “{ }” is used by WWdoc to hold the arguments presented to a procedure. These delimiters are matched. To key normal curly braces, WWdoc has created two tags “\{” (curly brace open) and “\}” (curly brace close).

WWdoc has also reserved the straight brace “[]”. Straight braces are used as delimiters to hold preference information in certain cases. When not following a preference callout, the straight brace will print as literal straight brace.

Within the straight brace delimiters, a percentage sign is used as a field separator when setting up preferences. It is also used when keying a matrix as a cell separator on a given row. To key a normal percentage sign, WWdoc has created the tag “\%”.

other reserved tags

Other reserved tags used to define specific attributes at insertion point:

AP	Is used to denote an alignment point.
AS	Is used to denote an alignment space.
UB	Is used to show where an AutoUpsizing Begins.
UE	Is used to show where an AutoUpsizing Ends.

- *N*[h%v]

Is used to show the nudge value of insertion point.
Inside the straight brace delimiters, the first field is the positive or negative horizontal value percentage.
The percentage sign acts as the tab to the next field. The second field is the positive or negative vertical value percentage.

Example: *N*[-20%30] will move the insertion point negative 20% horizontally, and 30% vertically.
- *FL*[?]

Is used to show the force level value at the insertion point.
- ~TINT*[C%Sh%OP]

Shows setting for tinting equation box.
C=case sensitive color name, SH=shade percentage,
OP=Optical Pad around equation

“from now on” tags

The following uppercase tags in tilde delimiters “~”, are used to set default preferences changes. These changes are “from now on”.

- ~ML~[?]

Shows default setting for math leading
- ~SA~[?]

Shows default setting for summation limit alignment.
L=left, C=Center, R=Right
- ~MAT~[C%R%A%W%F%K]

Shows default setting for matrix.
C=columns, R=rows,A=alignment (L=left, C=center, R=right),
W=column width, F= Fixed or Computed Columns (F=fixed, C=computed), K= keyboard sequence (A=across and down, D=down and across)

character font table

WWdoc was created without specific fonts in mind. However, this manual and the default superset uses the standard fonts shipped with PowerMath. The fourth column is used to show which font and keyboard stroke was originally used. Remember that in the Pi Character interface, the attributes of a character can be altered. This is a list of original font characters.

Font	Stroke
1-6	= (font) MathPi1 (keystroke) 6
Op	= OPTR
T	= TimesTen
P	= PBB
Sd	= Symbol (Dingbats)
-O-	Option
-S-	Shift

Column Format

1	2	3	4
|arcne|	arc northeast	⤴	6-]
|clubs|	clubs suit	♣	Sd-O-2

document layout

WWdoc is setup by procedures and characters. The first column is an example of syntax. The second column is an explanation of the procedure/character. The third column gives an example of how the character will print. The fourth column is the actual WWdoc string.

Radicals that fit normal uppercase characters or characters with acenders with superscript.

`*rad*{ }` normal radical $\sqrt{ab^{12}}$ [`&*rad*{ab^{12}}&`]

small radical

A small radical for lowercase character with no acenders or superscripts.

`*smrad*{ }` small radical \sqrt{a} [`&*smrad*{a}&`]

case fraction radical

A radical created to fit a case fraction as content

`*radcf*{ *cf*{?}{?} }` case fraction radical $\sqrt{\frac{a}{b}}$ [`&*radcf*{ *cf*{a}{b} }&`]

index radicals

`*rad*{|index?|?}` normal radical with index $\sqrt[3]{a}$ [`&*rad*{|index3|a}&`]

3	|index3|	5	|index5|
7	|index7|	9	|index9|
<i>n</i>	|indexn|	<i>m</i>	|indexm|
<i>o</i>	|indexo|	<i>p</i>	|indexp|
<i>q</i>	|indexq|	3	|smidx3| for *smrad*

`*smrad*{|smidx3|?}` small radical with index 3 $\sqrt[3]{a}$ [`&*smrad*{|smidx3|a}&`]

nested radicals

`*drad*{ }` radical inside a radical $\sqrt{x\sqrt{y}}$ [`&*drad*{x*rad*{y}}&`]

`*trad*{ }` triple radical $\sqrt{x\sqrt{y\sqrt{z}}}$
[`&*trad*{x*drad*{y*rad*{z}}}&`]

`*grad*{ }` quad radical $\sqrt{x\sqrt{y\sqrt{z\sqrt{a}}}}$
[`&*grad*{x*trad*{y*drad*{z*rad*{a}}}}&`]

`*quintrad*{ }` quint radical $\sqrt{x\sqrt{y\sqrt{z\sqrt{z\sqrt{z}}}}}$
[`&*quintrad*{x*grad*{y*trad*{z*drad*{z*rad*{z}}}}}&`]

`*sextrad*{ }` 6 level radical $\sqrt{x\sqrt{y\sqrt{z\sqrt{a\sqrt{b\sqrt{c}}}}}}$
[`&*sextrad*{x*quintrad*{y*grad*{z*trad*{a*drad*{b*rad*{c}}}}}}&`]

`*septrad*{ }` 7 level radical $\sqrt{w\sqrt{x\sqrt{y\sqrt{z\sqrt{a\sqrt{b\sqrt{c}}}}}}}$
[`&*septrad*{w*sextrad*{x*quintrad*{y*grad*{z*trad*{a*drad*{b*rad*{c}}}}}}}&`]

`*octrad*{ }` 8 level radical $\sqrt{u\sqrt{v\sqrt{x\sqrt{y\sqrt{z\sqrt{a\sqrt{b\sqrt{c}}}}}}}}$
[`&*octrad*{u*septrad*{v*sextrad*{x*quintrad*{y*grad*{z*trad*{a*drad*{b*rad*{c}}}}}}}}&`]

Summation

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<code>*sum*{}{}</code>	summation	\sum_b^a	<code>[&*sum*{a}{b}&]</code>
<code>*dsum*{}{}</code>	double summation	$\sum_b^a \sum$	<code>[&*dsum*{a}{b}&]</code>
<code>*tsum*{}{}</code>	triple summation	$\sum_b^a \sum \sum$	<code>[&*tsum*{a}{b}&]</code>
<code>*qsum*{}{}</code>	quad summation	$\sum_b^a \sum \sum \sum$	<code>[&*qsum*{a}{b}&]</code>

variant summation

<code>*vsum*{}{}</code>	variant summation	\sum_b^a	<code>[&*vsum*{a}{b}&]</code>
<code>*vdsum*{}{}</code>	variant double summation	$\sum_b^a \sum$	<code>[&*vdsum*{a}{b}&]</code>
<code>*vtsum*{}{}</code>	variant triple summation	$\sum_b^a \sum \sum$	<code>[&*vtsum*{a}{b}&]</code>
<code>*vqsum*{}{}</code>	variant quad summation	$\sum_b^a \sum \sum \sum$	<code>[&*vqsum*{a}{b}&]</code>

small summations

<code>*smsum*{}{}</code>	small summation (inline)	\sum_b^a	<code>[&*smsum*{a}{b}&]</code>
<code>*smdsum*{}{}</code>	small double summation	$\sum_b^a \sum$	<code>[&*smdsum*{a}{b}&]</code>
<code>*smtsum*{}{}</code>	small triple summation	$\sum_b^a \sum \sum$	<code>[&*smtsum*{a}{b}&]</code>
<code>*smqsum*{}{}</code>	small quad summation	$\sum_b^a \sum \sum \sum$	<code>[&*smqsum*{a}{b}&]</code>

Stacked Limits

<code>*L*?</code>	stacked sup/subs over limits	$\sum_{a+b}^{a-b} \sum_{y} [\&*sum*\{x*L*{a\minus b}\} \{y*L*{a\plus b}\} \&]$
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Integral

<code>*int*{}{}</code>	integral	\int_b^a	<code>[&*int*{a}{b}&]</code>
<code>*dint*{}{}</code>	double integral	\iint_b^a	<code>[&*dint*{a}{b}&]</code>
<code>*tint*{}{}</code>	triple integral	\iiint_b^a	<code>[&*tint*{a}{b}&]</code>
<code>*qint*{}{}</code>	quad integral	\iiint_b^a	<code>[&*qint*{a}{b}&]</code>

<code>*vint*{}{}</code>	variant integral	\int_b^a	<code>[&*vint*{a}{b}&]</code>
<code>*vdint*{}{}</code>	variant double integral	\iint_b^a	<code>[&*vdint*{a}{b}&]</code>
<code>*vtint*{}{}</code>	variant triple integral	\iiint_b^a	<code>[&*vtint*{a}{b}&]</code>
<code>*vqint*{}{}</code>	variant quad integral	\iiint_b^a	<code>[&*vqint*{a}{b}&]</code>

small integrals

<code>*smint*{}{}</code>	small integral (inline)	\int_b^a	<code>[&*smint*{a}{b}&]</code>
<code>*smdint*{}{}</code>	small double integral	\iint_b^a	<code>[&*smdint*{a}{b}&]</code>
<code>*smtint*{}{}</code>	small triple integral	\iiint_b^a	<code>[&*smtint*{a}{b}&]</code>
<code>*smqint*{}{}</code>	small quad integral	\iiint_b^a	<code>[&*smqint*{a}{b}&]</code>

other integrals

<code>*oint*{}{}</code>	“O” integral	\oint_b^a	<code>[&*oint*{a}{b}&]</code>
<code>*cint*{}{}</code>	contour integral	\oint_b^a	<code>[&*cint*{a}{b}&]</code>
<code>*coint*{}{}</code>	contour o-integral	\oint_b^a	<code>[&*coint*{a}{b}&]</code>
<code>*vcint*{}{}</code>	variant contour integral	\oint_b^a	<code>[&*vcint*{a}{b}&]</code>
<code>*vcoint*{}{}</code>	variant contour o-integral	\oint_b^a	<code>[&*vcoint*{a}{b}&]</code>
<code>*doint*{}{}</code>	double O-integral	\oint_b^a	<code>[&*doint*{a}{b}&]</code>
<code>*smcoint*{}{}</code>	small contour o-integral	\oint_b^a	<code>[&*smcoint*{a}{b}&]</code>
<code>*smcint*{}{}</code>	small contour integral	\oint_b^a	<code>[&*smcint*{a}{b}&]</code>
<code>*smoint*{}{}</code>	small o-integral	\oint_b^a	<code>[&*smoint*{a}{b}&]</code>

P r o d u c t

<code>*prod*{}{}</code>	product	\prod_b^a	<code>[&*prod*{a}{b}&]</code>
<code>*dprod*{}{}</code>	double products	$\prod_b^a \prod$	<code>[&*dprod*{a}{b}&]</code>

<code>*tprod*{}{}{}</code>	triple products	$\prod_b^a \prod \prod$	<code>[&*tprod*{a}{b}&]</code>
<code>*qprod*{}{}{}</code>	quad products	$\prod_b^a \prod \prod \prod \prod$	<code>[&*qprod*{a}{b}&]</code>

variant product

<code>*vprod*{}{}{}</code>	variant product	\prod_b^a	<code>[&*vprod*{a}{b}&]</code>
<code>*vdprod*{}{}{}</code>	variant double product	$\prod \prod_b^a$	<code>[&*vdprod*{a}{b}&]</code>
<code>*vtprod*{}{}{}</code>	variant triple product	$\prod \prod \prod_b^a$	<code>[&*vtprod*{a}{b}&]</code>
<code>*vqprod*{}{}{}</code>	variant quad product	$\prod \prod \prod \prod_b^a$	<code>[&*vqprod*{a}{b}&]</code>

small product

<code>*smprod*{}{}{}</code>	small product	\prod_b^a	<code>[&*smprod*{a}{b}&]</code>
<code>*smdprod*{}{}{}</code>	small double product	$\prod \prod_b^a$	<code>[&*smdprod*{a}{b}&]</code>
<code>*smtprod*{}{}{}</code>	small triple product	$\prod \prod \prod_b^a$	<code>[&*smtprod*{a}{b}&]</code>
<code>*smqprod*{}{}{}</code>	small quad product	$\prod \prod \prod \prod_b^a$	<code>[&*smqprod*{a}{b}&]</code>

Coproduct

<code>*coprod*{}{}{}</code>	coproduct	\prod_b^a	<code>[&*coprod*{a}{b}&]</code>
<code>*dcoprod*{}{}{}</code>	double coproduct	$\prod \prod_b^a$	<code>[&*dcoprod*{a}{b}&]</code>
<code>*tcoprod*{}{}{}</code>	triple coproduct	$\prod \prod \prod_b^a$	<code>[&*tcoprod*{a}{b}&]</code>
<code>*qcoprod*{}{}{}</code>	quad coproduct	$\prod \prod \prod \prod_b^a$	<code>[&*qcoprod*{a}{b}&]</code>

variant coproduct

<code>*vcoprod*{}{}{}</code>	variant coproduct	\prod_b^a	<code>[&*vcoprod*{a}{b}&]</code>
<code>*vdcoprod*{}{}{}</code>	variant double coproduct	$\prod \prod_b^a$	<code>[&*vdcoprod*{a}{b}&]</code>
<code>*vtcoprod*{}{}{}</code>	variant triple coproduct	$\prod \prod \prod_b^a$	<code>[&*vtcoprod*{a}{b}&]</code>
<code>*vqcoprod*{}{}{}</code>	variant quad coproduct	$\prod \prod \prod \prod_b^a$	<code>[&*vqcoprod*{a}{b}&]</code>

small coproduct

<code>*smcoprod*{}{}{}</code>	small coproduct	\prod_b^a	<code>[&*smcoprod*{a}{b}&]</code>
<code>*smdcoprod*{}{}{}</code>	small double coproduct	$\prod \prod_b^a$	<code>[&*smdcoprod*{a}{b}&]</code>
<code>*smtcoprod*{}{}{}</code>	small triple coproduct	$\prod \prod \prod_b^a$	<code>[&*smtcoprod*{a}{b}&]</code>
<code>*smqcoprod*{}{}{}</code>	small quad coproduct	$\prod \prod \prod \prod_b^a$	<code>[&*smqcoprod*{a}{b}&]</code>

U n i o n

<code>*union*{ }{ }</code>	union	\bigcup_b^a	<code>[&*union*{a}{b}&]</code>
<code>*dunion*{ }{ }</code>	double union	$\bigcup_b^a \bigcup_b^a$	<code>[&*dunion*{a}{b}&]</code>
<code>*tunion*{ }{ }</code>	triple union	$\bigcup_b^a \bigcup_b^a \bigcup_b^a$	<code>[&*tunion*{a}{b}&]</code>
<code>*qunion*{ }{ }</code>	quad union	$\bigcup_b^a \bigcup_b^a \bigcup_b^a \bigcup_b^a$	<code>[&*qunion*{a}{b}&]</code>

variant union

<code>*vunion*{ }{ }</code>	variant union	\bigcup_b^a	<code>[&*vunion*{a}{b}&]</code>
<code>*vdunion*{ }{ }</code>	variant double union	$\bigcup_b^a \bigcup_b^a$	<code>[&*vdunion*{a}{b}&]</code>
<code>*vtunion*{ }{ }</code>	variant triple union	$\bigcup_b^a \bigcup_b^a \bigcup_b^a$	<code>[&*vtunion*{a}{b}&]</code>
<code>*vqunion*{ }{ }</code>	variant quad union	$\bigcup_b^a \bigcup_b^a \bigcup_b^a \bigcup_b^a$	<code>[&*vqunion*{a}{b}&]</code>

small union

<code>*smunion*{ }{ }</code>	small union	\bigcup_b^a	<code>[&*smunion*{a}{b}&]</code>
<code>*smdunion*{ }{ }</code>	small double union	$\bigcup_b^a \bigcup_b^a$	<code>[&*smdunion*{a}{b}&]</code>
<code>*smtunion*{ }{ }</code>	small triple union	$\bigcup_b^a \bigcup_b^a \bigcup_b^a$	<code>[&*smtunion*{a}{b}&]</code>
<code>*smqunion*{ }{ }</code>	small quad union	$\bigcup_b^a \bigcup_b^a \bigcup_b^a \bigcup_b^a$	<code>[&*smqunion*{a}{b}&]</code>

other unions

<code>*unionplus*{ }{ }</code>	union plus	$\bigcup_b^a \oplus$	<code>[&*unionplus*{a}{b}&]</code>
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I n t e r s e c t i o n

<code>*inters*{ }{ }</code>	intersection	\bigcap_b^a	<code>[&*inters*{a}{b}&]</code>
<code>*dinters*{ }{ }</code>	double intersection	$\bigcap_b^a \bigcap_b^a$	<code>[&*dinters*{a}{b}&]</code>
<code>*tinters*{ }{ }</code>	triple intersection	$\bigcap_b^a \bigcap_b^a \bigcap_b^a$	<code>[&*tinters*{a}{b}&]</code>
<code>*qinters*{ }{ }</code>	quad intersection	$\bigcap_b^a \bigcap_b^a \bigcap_b^a \bigcap_b^a$	<code>[&*qinters*{a}{b}&]</code>

variant intersection

<code>*vinters*{ }{ }</code>	variant intersection	\bigcap_b^a	<code>[&*vinters*{a}{b}&]</code>
<code>*vdinters*{ }{ }</code>	variant double intersection	$\bigcap_b^a \bigcap_b^a$	<code>[&*vdinters*{a}{b}&]</code>

<code>*vtinters*{ }{ }</code>	variant triple intersection	$\cap\cap\cap_b^a$	<code>[&*vtinters*{a}{b}&]</code>
<code>*vqinters*{ }{ }</code>	variant quad intersection	$\cap\cap\cap\cap_b^a$	<code>[&*vqinters*{a}{b}&]</code>

small intersection

<code>*sminters*{ }{ }</code>	small intersection	\cap_b^a	<code>[&*sminters*{a}{b}&]</code>
<code>*smdinters*{ }{ }</code>	small double intersection	$\cap\cap_b^a$	<code>[&*smdinters*{a}{b}&]</code>
<code>*smtinters*{ }{ }</code>	small triple intersection	$\cap\cap\cap_b^a$	<code>[&*smtinters*{a}{b}&]</code>
<code>*smqinters*{ }{ }</code>	small quad intersection	$\cap\cap\cap\cap_b^a$	<code>[&*smqinters*{a}{b}&]</code>

other intersections

Limits

<code>*lim*{!lim!}{ }</code>	limit with sub in curly	$\lim_{n \rightarrow \infty}$	<code>[&*lim*{!lim!}{n|rarr|inf}&]</code>
<code>*lim*{!lims!}{ }</code>	limit superior	$\limsup_{n \rightarrow \infty}$	<code>[&*lim*{!lims!}{n|rarr|inf}&]</code>
<code>*lim*{!limi!}{ }</code>	limit inferior	$\liminf_{n \rightarrow \infty}$	<code>[&*lim*{!limi!}{n|rarr|inf}&]</code>
<code>*lim*{!pos!}{ }</code>	limit positive	$\lim_{n \rightarrow \infty}^{\text{pos}}$	<code>[&*lim*{!pos!}{n|rarr|inf}&]</code>
<code>*lim*{!neg!}{ }</code>	limit negative	$\lim_{n \rightarrow \infty}^{\text{neg}}$	<code>[&*lim*{!neg!}{n|rarr|inf}&]</code>

Note: The baseline content is not considered roman unless the style is changed. Then the under baseline limit is not normal style unless reset.

Note: A macro for roman “lim” and other standand roman text. This macro sets a thin space before and after the baseline content.

Definition

Note: Most definitions are set with an open (but no close) fence. Notice how we set the three level fence with the Pi Character tag “3{“ (ASCII: |3{|)

<code>*def*{ }{ }</code>	definition	$\left\{ \begin{array}{l} abc \\ def \end{array} \right.$	<code>[& 3{ *def*{abc}{def}&]</code>
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triple definition

<code>*tdef*{ }{ }</code>	definition three levels	$\begin{array}{l} dw \neq 0 \\ dy = 0 \\ d = b \end{array}$	<code>[&*tdef*{dy=0}{dw\neq0}{d=b}&]</code>
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Fractions

<code>*frac*{ }{ }</code>	fraction	$\frac{a}{b}$	<code>[&*frac*{a}{b}&]</code>
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heavy fraction bar

<code>*hfrac*{ }{ }</code>	heavy fraction bar	$\frac{a}{b}{c}$	<code>[&*hfrac*{*frac*{a}{b}}{c}&]</code>
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case fractions

<code>*cf*{ }{ }</code>	case fraction	$\frac{a}{b}$	<code>[&*cf*{a}{b}&]</code>
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other fractions

<code>!dfrac!\$\$</code>	diagonal fraction	$\frac{a}{b}$	<code>[&^{\{a\}}dfrac_{\{b\}}&]</code>
<code>!sfrac!\$\$</code>	special fraction	$\frac{a}{b}$	<code>[&^{\{a\}}sfrac_{\{b\}}&]</code>
<code>|sol|</code>	solidus fraction	a/b	<code>[&a|sol b&]</code>

Math Rule

<code>*orule*{ }</code>	over rule for lowercase	\bar{a}	<code>[&*orule*{\{a\}}&]</code>
<code>*obar*{ }</code>	over bar for capital or ascenders	\bar{d}	<code>[&*obar*{\{d\}}&]</code>
<code>*dobar*{ *obar*{ } }</code>	double over bar	$\bar{\bar{d}}$	<code>[&*dobar*{\{ *obar*{\{d\}} \}}&]</code>
<code>*tobar*{ *dobar*{ *obar*{ } } }</code>	triple over bar	$\bar{\bar{\bar{d}}}$	<code>[&*tobar*{\{ *dobar*{\{ *obar*{\{d\}} \}} \}}&]</code>

underline

<code>*uline*{ }</code>	underline	$a - 1 = 0$	<code>[&*uline*{\{a-1=0\}}&]</code>
<code>*duline*{ *uline*{ } }</code>	double underline	$\underline{a - 1 = 0}$	<code>[&*duline*{\{ *uline*{\{a-1=0\}} \}}&]</code>

cancellation

<code>*canc*{ }</code>	cancellation	\cancel{abcd}	<code>[&*canc*{\{abcd\}}&]</code>
<code>*dcanc*{ }</code>	down cancellation	\cancel{abcd}	<code>[&*dcanc*{\{abcd\}}&]</code>
<code>*dcanc*{ *canc*{ } }</code>	double cancellation	$\cancel{\cancel{abcd}}$	<code>[&*dcanc*{\{ *canc*{\{abcd\}} \}}&]</code>

Angle

<code>*angl*{ }</code>	angle	$\angle abcdef$	<code>[&*angl*{\{abcdef\}}&]</code>
------------------------	-------	-----------------	---

Vector arrows

<code>*orule*{ }|lcarrhd|</code>	lowercase over rule with lowercase arrowhead	\overrightarrow{acgn}	<code>[&*orule*{\{acgn\}}|lcarrhd|&]</code>
<code>*obar*{ }|ucarrhd|</code>	uppercase over bar with uppercase arrowhead	\overrightarrow{abcd}	<code>[&*obar*{\{abcd\}}|ucarrhd|&]</code>
<code>*uline*{ }|ularrhd|</code>	underline with underline arrowhead	\underline{acgn}	<code>[&*uline*{\{acgn\}}|ularrhd|&]</code>

Note: The commands and arrowhead differ between upper-lowercase or underline characters.

Superior / Inferior

<code>^{ }</code>	superscript	a^2	<code>[&a^{\{2\}}&]</code>
<code>_^{ }</code>	subscript	a_2	<code>[&a_{\{2\}}&]</code>

stacked superior/inferior

<code>^{\{ }_{\{ } }</code>	stacked super and subs	x_b^a	<code>[&x^{\{a\}}_{\{b\}}&]</code>
<code>^{\{ }_{\{ } }^{\{ }_{\{ } }</code>	prestacked super and subs	$\frac{a}{b}x$	<code>[&^{\{a\}}_{\{b\}}x&]</code>

Stacking

oscr{}{} over script
uscr{}{} under script

$$\begin{array}{l} a+b \\ x \end{array} \quad [\&*oscr*\{x\}\{a|plusns|b\}\&]$$

$$\begin{array}{l} x \\ a+b \end{array} \quad [\&*uscr*\{x\}\{a|plusns|b\}\&]$$

ouscr{}{}{} over under script

$$d \begin{array}{l} a \\ \ll \\ b \end{array} y \quad [\&*ouscr*\{d||less|y\}\{a\}\{b\}\&]$$

Spaces

|sp|	space	$a \ b$	$[\&a|sp|b\&]$
|hs|	hairspace	ab	$[\&a|hs|b\&]$
|thn|	thin space	ab	$[\&a|thn|b\&]$
|thk|	thick space	ab	$[\&a|thk|b\&]$
|em|	em space	$a \ b$	$[\&a|em|b\&]$
|en|	en space	$a \ b$	$[\&a|en|b\&]$
|cu|	negative space (close up)	ab	$[\&a|cu|b\&]$

Matrices

~MAT~[3%3%C%120%F%A]*MAT*{}{}{}{}

matrix [columns%rows%alignment%column width%computed or fixed
%keyboard across/down or down/across

$$\begin{array}{cc} a & b \\ c & d \end{array}$$

$$[\&\sim\text{MAT}\sim[2\%2\%C\%120.0\%C\%A]*\text{MAT}*\{a\%b\}\{c\%d\}\&]$$

Style Changes

~rom~?~norm~ roman text then back to normal x is not equal to y

$$[\&x|em|\sim\text{rom}\sim\text{is}|sp|not|sp|equal|sp|to\sim\text{norm}\sim|em|y\&]$$

~bf~?~norm~ boldface text

$$x \text{ is } y \quad [\&x|em|\sim\text{bf}\sim\text{is}\sim\text{norm}\sim|em|y\&]$$

~cbb~?~norm~ chalkboard bold

$$x = \mathbb{ABC} \quad [\&x=\sim\text{cbb}\sim\text{ABC}\sim\text{norm}\sim\&]$$

~greek~?~norm~ change font to greek

$$x = \alpha\beta\psi \quad [\&x=\sim\text{greek}\sim\text{abc}\sim\text{norm}\sim\&]$$

~bfgreek~?~norm~ change font to bold greek

$$x = \boldsymbol{\alpha\beta\psi} \quad [\&x=\sim\text{bfgreek}\sim\text{ABC}\sim\text{norm}\sim\&]$$

~it~?~norm~ italic text

$$\textit{always is } \Delta \quad [\&\sim\text{it}\sim\text{always}|sp|is|sp||\text{Del}|\&]$$

~fancy~?~norm~ script font

$$x = \mathcal{ABC} \quad [\&x=\sim\text{fancy}\sim\text{abc}\sim\text{norm}\sim\&]$$

~frak~?~norm~ unique font

$$x = \mathfrak{ABC} \quad [\&x=\sim\text{frak}\sim\text{ABC}\sim\text{norm}\sim\&]$$

~ho~?~norm~ unique font

$$x = \mathbf{abc} \quad [\&x=\sim\text{ho}\sim\text{abc}\sim\text{norm}\sim\&]$$

El - High

eldiv{} el-hi division

$$1\overline{a+b} \quad [\&1*\text{eldiv}*\{a+b\}\&]$$

Alignment

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AP	alignment point	$a + b = c$	[&*AS*a+b*AP*=c&]
AS	alignment space	$= c + d$	[&*AS**AP*=c+d&]

Accents

lcacc{ }{ }	lowercase accent	\dot{x}	[&*lcacc*{x}{ Adot }&]
ucacc{ }{ }	uppercase accent	\dot{X}	[&*ucacc*{X}{|Adot|}&]

The syntax used is the same for all accents differing with uppercase or lowercase characters. The first delimited field is for the character which will be accented. The second field is for the accent. The main math accents are tagged with a capital “A” denoting accent. The list below contains all the accents WWdoc and the default superset have available. Any character in any font or attribute (Italic, Greek, Cursive, Roman, Bold, Small Caps, etc.) will be correctly accented. According to specs, the accent resides 2 pts above the highest part of the font character.

normal accents

|Adot|	dot	\cdot	[&*ucacc*{|Adot|}&]
|Addot|	double dot	$\ddot{}$	[&*ucacc*{|Addot|}&]
|Atdot|	triple dot	\cdotp	[&*ucacc*{|Atdot|}&]
|Ahat|	hat	$\hat{}$	[&*ucacc*{|Ahat|}&]
|Arhar|	right harpoon	\rightharpoonup	[&*ucacc*{|Arhar|}&]
|Alhar|	left harpoon	\leftharpoonup	[&*ucacc*{|Alhar|}&]
|Asth|	strike through	$\cancel{}$	[&*ucacc*{d}{|Asth|}&]
|Atil|	tilde	\sim	[&*ucacc*{|Atil|}&]

other accents

|circ|	circumflex	\frown	T-S-O-i
|circodash|	circumflex over dash	$\circ\!\!\!\diagup$	5-S-l
|dashdot|	dashdot	\dashv	5-S-r
|dashodash|	dash over dash	\equiv	5-S-5
|dashodot|	dash over dot	\dashv	5-S-h
|dashoddot|	dash over double dot	\ddashv	5-S-k
|dashodot|	dash open dot	$\circ\!\!\!\diagup$	5-S-f
|dotodash|	dot over dash	$\dot{}\!\!\!\diagup$	5-S-g
|ddotodash|	double dot over dash	$\ddot{}\!\!\!\diagup$	5-S-j
|dotdash|	dot dash	$\dot{}\!\!\!\diagup$	5-S-e
|grave|	grave	$\grave{}$	5-S-0
|odotdash|	open dot dash|	$\circ\!\!\!\diagup$	5-S-d
|sdot|	single dot	\cdot	5-S-`
|smbar|	small bar	$\bar{}$	5-S-3

|tilde|	tilde	~	T-S-`
|toneg|	towards negative	↖	5-S-m
|tonegp|	towards neg plus	↗	2-`
|topos|	towards positive	↖	2-S-[
|toposneg|	towards positive negative	↗	2-S-`
|toposu|	towards positive under	↖	5-S-n
|vtoneg|	variant toward negative	↗	2-S-\
|vtopos|	variant toward positive	↖	2-\

Trigonometry Macros

!arcc|	arccosine	arcs
!arcs|	arcsine	arcsin
!arct|	arctangent	arctan
!cos|	cosine	cos
!cot|	cosine tangent	cot
!csc|	cosine sine cosine	csc
!det|	determinant	det
!inf|	inferior	inferior
!lim|	limit	lim
!limi|	limit inferior	lim inf
!lims|	limit superior	lim sup
!ln|	logarithm	ln
!log|	logarithm	log
!sec|	secant	sec
!sin|	sine	sin
!tan|	tangent	tan

other macros

!arg|	argument	arg
!atm|	atmosphere	atm
!Btu|	British thermal unit	Btu
!cal|	calorie	cal
!cm|	centimeter	cm
!degF|	degree Fahrenheit	°F
!degC|	degree Celsius	°C
!degR|	degree Rankline	°R
!dim|	dimension	dim
!exp|	exponential	exp
!foot|	foot	ft
!ft3m|	cubic foot per minute	ft ³ /min

!ft3s!	cubic foot per second	ft ³ /s
!ftp!	foot pound	ft·lb
!fts!	foot per second	ft/s
!gram!	gram	g
!gal!	gallon	gal
!gra!	grain	gr
!hour!	hour	h
!hom!	homology	hom
!Ima!	Imaginary	Im
!inch!	inch	in.
!IU!	international unit	IU
!kal!	kalvin	k
!kmh!	kilometers per hour	km/h
!kilo!	kilogram	K
!ker!	kernal	ker
!lbs!	pound	lb
!lb2f!	pound force per square foot	lb/ft ²
!lb2i!	pound force per square inch	lb/in ²
!lb3f!	pound per cubic foot	lb/ft ³
!LCD!	lowest common denominator	LCD
!lub!	least upper bound	lub
!met!	meter	m
!me2!	meter	m ²
!max!	maximum	max
!mil!	mile	mi
!mih!	mile per hour	mi/h
!min!	minumum	min
!mod!	modulus	mod
!qrt!	quart	qt
!real!	real	Re
!rem!	roentegen equivalent man	rem
!rmin!	revolutions per minute	r/min
!rpm!	revolutions per minute	rpm
!rps!	revolutions per second	rps
!rsec!	revolutions per second	r/sec
!volt!	volt	v
!watt!	watt	w
!yard!	yard	yd
!Volt!	volt	V
!Watt!	watt	W

www.doc/math

(	open parenthesis	(	P-S-a
)	close parenthesis	)	P-S-b
|abso|	absolute value bar open	|	P-0
|absc|	absolute value bar close	|	P-0
|abo|	angle brace open	<	P-S-h
|abc|	angle brace close	>	P-S-i
\{	open curly brace	{	T-S-[
\}	close curly brace	}	T-S-]
|fdqo|	french double quote open	«	T-O-\
|fdqc|	french double quote close	»	T-S-O-\
|fsqo|	french single quote open	<	T-S-O-3
|fsqc|	french single quote close	>	T-S-O-4
|hcuro|	hollow curly open	[	3-S-n
|hcurc|	hollow curly close	]	3-S-m
\\[	open square brace	[	T-[
\]	close square brace	]	T-]
|hsbo|	hollow straight brace open	[	P-S-O-q
|hsbc|	hollow straight brace close	]	P-O-q
|normo|	norm open	||	P-7
|normo|	norm close	||	P-7
|vhsbc|	variant hollow straight brace close	]	3-S-b
|vhsbo|	variant hollow straight brace open	[	3-S-v
|vnormo|	variant norm open	||	3-i
|vnormo|	variant norm close	||	3-i

Literal Characters

\{	open curly brace	{	T-S-[
\}	close curly brace	}	T-S-]
\\[	open square brace	[	T-[
\]	close square brace	]	T-]
\^	caret	^	T-S-6
_	underscore	_	T-S- -
*	asterisk	*	T-S-8
\~	tilde	~	T-S-`
\!	exclamation	!	T-S-1
\\$	dollar sign	\$	T-S-4
\&	ampersand	&	T-S-7
\%	percent	%	T-S-5
\	pipe		T-S-\

U p s i z e d B r a c e s

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3{	three level curly brace open	{	[& 3{ &]
3}	three level curly brace close	}	[& 3} &]
5{	five level curly brace open	{	[& 5{ &]
|5}|	five level curly brace close	}	[&|5}|&]
|7{|	seven level curly brace open	{	[&|7{|&]
|7}|	seven level curly brace close	}	[&|7}|&]
|3[|	three level square brace open	[	[&|3[|&]
|3]|	three level square brace close	]	[&|3]|&]
|5[|	five level square brace open	[	[&|5[|&]
|5]|	five level square brace close	]	[&|5]|&]
7[seven level square brace open	[[& 7[&]
7]	seven level square brace close]	[& 7] &]

Geometry

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ang	angle	\angle	6-/
angs	angle s	\angle_s	6-S-/
angarcn	angle arc north	\sphericalangle	5-O-` + S-e
arcne	angle arc northeast	$\sphericalangle_{\text{NE}}$	6-]
|angarcnw|	angle arc northwest	$\sphericalangle_{\text{NW}}$	6-S-]
|arce|	angle arc east	$\sphericalangle_{\text{E}}$	6-\
|angarcw|	angle arc west	$\sphericalangle_{\text{W}}$	6-S-\
|arcinter|	arc intersect	\cap	5-]
|arcn|	arc north	\frown	5-S-x
|arcns|	arcs north south	\bowtie	5-S-]
|boxdot|	box dot	\boxdot	6-S-0
|boxfse|	box filled south east	\boxplus	6-o
|boxhse|	box half solid east	\boxhalfplus	6-l
|boxhsow|	box half solid west	\boxhalfminus	6-k
|boxsnw|	box half solid northwest	\boxtimes	6-i
|boxsol|	box solid	\boxtimes	6-j
|dhollbox|	double hollow box	\boxminus	6-a
|ocircle|	open circle	\bigcirc	6-s
|ocminus|	open circle minus	\ominus	6-S-2
|perp|	perpendicular	\perp	6-'
|perps|	perpendiculars	\perp_s	6-S-'
|rhombus|	rhombus	\diamond	6-S-`
|rang|	right angle	L	6-z
|triad|	triangle down	∇	6-,
|triadot|	triangle dot	$\triangle\cdot$	6-S- -
|triads|	triangle down solid	\blacktriangledown	6-.
|triagl|	triangle up solid	\blacktriangle	6-m
|triahse|	triangle half solid east	\blacktriangleleft	6-y
|triahsw|	triangle half solid west	\blacktriangleright	6-t
|trial|	left triangle	\triangleleft	6-v
|trials|	triangle left solid	\blacktriangleleft	6-b
|triao|	triangle open	\triangle	6-n
|triar|	triangle right	\triangleright	6-x
|triasr|	triangle right solid	\blacktriangleright	6-c

|Alp|	capital Alpha	Α	1-S-a
|alp|	alpha	α	1-a
|Beta|	capital Beta	Β	1-S-b
|beta|	beta	β	1-b
|Chi|	capital Chi	Χ	1-S-x
|chi|	chi	χ	1-x
|Del|	capital Delta	Δ	1-S-d
|del|	delta	δ	1-d
|Eps|	capital Epsilon	Ε	1-S-e
|eps|	epsilon	ε	1-e
|Eta|	capital Eta	Η	1-S-h
|eta|	eta	η	1-h
|Gam|	capital Gamma	Γ	1-S-g
|gam|	gamma	γ	1-g
|Iota|	capital Iota	Ι	1-S-i
|iota|	iota	ι	1-i
|Kap|	capital Kappa	Κ	1-S-k
|kap|	kappa	κ	1-k
|Lam|	capital Lambda	Λ	1-S-l
|lam|	lambda	λ	1-l
|Mu|	capital Mu	Μ	1-S-m
|mu|	mu	μ	1-m
|Nu|	capital Nu	Ν	1-S-n
|nu|	nu	ν	1-n
|Ome|	capital Omega	Ω	1-S-v
|ome|	omega	ω	1-v
|Omi|	capital Omicron	Ο	1-S-o
|omi|	omicron	ο	1-o
|Phi|	capital Phi	Φ	1-S-f
|phi|	phi	φ	1-f
|Pi|	capital Pi	Π	1-S-p
|pi|	pi	π	1-p
|Psi|	capital Psi	Ψ	1-S-c
|psi|	psi	ψ	1-c
|Rho|	capital Rho	Ρ	1-S-r
|rho|	rho	ρ	1-r
|Sig|	capital Sigma	Σ	1-S-s
|sig|	sigma	σ	1-s

|Tau|	capital Tau	T	1-S-t
|tau|	tau	τ	1-t
|The|	capital Theta	Θ	1-S-u
|the|	theta	θ	1-u
|Ups|	capital Upsilon	Υ	1-S-y
|ups|	upsilon	υ	1-y
|Xi|	capital Xi	Ξ	1-S-j
|xi|	xi	ξ	1-j
|Zeta|	capital Zeta	Z	1-S-z
|zeta|	zeta	ζ	1-z

boldface greek

|bfAlp|	boldface capital Alpha	A	4-S-a
|bfalp|	boldface alpha	α	4-a
|bfBeta|	boldface capital Beta	B	4-S-b
|bfbeta|	boldface beta	β	4-b
|bfChi|	boldface capital Chi	X	4-S-x
|bfchi|	boldface chi	χ	4-x
|bfDel|	boldface capital Delta	Δ	4-S-d
|bfdel|	boldface delta	δ	4-d
|bfEps|	boldface capital Epsilon	E	4-S-e
|bfeps|	boldface epsilon	ε	4-e
|bfEta|	boldface capital Eta	H	4-S-h
|bfeta|	boldface eta	η	4-h
|bfGam|	boldface capital Gamma	Γ	4-S-g
|bfgam|	boldface gamma	γ	4-g
|bfIota|	boldface capital Iota	I	4-S-i
|bfiota|	boldface iota	ι	4-i
|bfKap|	boldface capital Kappa	K	4-S-k
|bfkap|	boldface kappa	κ	4-k
|bfLam|	boldface capital Lambda	Λ	4-S-l
|bflam|	boldface lambda	λ	4-l
|bfMu|	boldface capital Mu	M	4-S-m
|bfmu|	boldface mu	μ	4-m
|bfNu|	boldface capital Nu	N	4-S-n
|bfnu|	boldface nu	ν	4-n
|bfOme|	boldface capital Omega	Ω	4-S-v
|bfome|	boldface omega	ω	4-v
|bfOmni|	boldface capital Omni	O	4-S-o
|bfomni|	boldface omni	o	4-o

|bfPhi|	boldface capital Phi	Φ	4-S-f
|bfphi|	boldface phi	φ	4-f
|bfPi|	boldface capital Pi	Π	4-S-p
|bfpi|	boldface pi	π	4-p
|bfPsi|	boldface capital Psi	Ψ	4-S-c
|bfpsi|	boldface psi	ψ	4-c
|bfRho|	boldface capital Rho	Ρ	4-S-r
|bfrho|	boldface rho	ρ	4-r
|bfSig|	boldface capital Sigma	Σ	4-S-s
|bfsig|	boldface sigma	σ	4-s
|bfTau|	boldface capital Tau	Τ	4-S-t
|bftau|	boldface tau	τ	4-t
|bfThe|	boldface capital Theta	Θ	4-S-u
|bfthe|	boldface theta	θ	4-u
|bfUps|	boldface capital Upsilon	Υ	4-S-y
|bfups|	boldface upsilon	υ	4-y
|bfXi|	boldface capital Xi	Ξ	4-S-j
|bfxi|	boldface xi	ξ	4-j
|bfZeta|	boldface capital Zeta	Ζ	4-S-z
|bfzeta|	boldface zeta	ζ	4-z

variant greek

|barlam|	bar lambda	λ	Op-e
|bfveps|	boldface variant epsilon	ε	4-S-O-e
|bfvphi|	boldface variant phi	φ	4-w
|bfvsig|	boldface variant sigma	ς	4-O-s
|bfvThe|	boldface variant capital Theta	Θ	4-S-q
|bfvthe|	boldface variant theta	θ	4-q
|bfvpi|	boldface variant pi	π	4-O-v
|veps|	variant epsilon	ε	1-S-O-e
|vphi|	variant phi	φ	1-w
|vsig|	variant sigma	ς	1-O-s
|vThe|	variant capital Theta	Θ	1-S-q
|vthe|	variant theta	θ	1-q

Math Characters

|bddots|	back diagonal dots	⋯	Op-O-5
|cdot|	center dot	⋅	Op-S-3
|cdots|	center dots	⋯	Op-p
|ddashes|	diagonal dashes	⋯	2-O-3



|ddots|	diagonal dots	\ddots	O-O-t
|elip|	ellipses	\dots	Op-p
|emd|	em dash	—	T-S-O- -
|end|	en dash	–	T-O- -
|dash|	dash	—	T- -
|paradot|	parathesis dot	(\cdot)	5-[
|vdashs|	vertical dashes	\vdash	2-O-1
|vdots|	vertical dots	\vdots	Op-o
|ast|	literal asterisk	*	T-S-8
|at|	at symbol	@	T-S-2
|cents|	cents	¢	T-O-4
|copyright|	copyright	©	T-O-g
|crhash|	cross hash	⦿	3-]
|dag|	dagger	†	T-O-t
|ddag|	double dagger	‡	T-S-O-7
|deg|	degree	°	T-O-0
|ele|	element	∈	5-S-p
|emset|	empty set	∅	1-[
|exists|	exists	∃	Op-S-e
|fractrl|	factorial upside down	¡	T-O-1
|inf|	infinity	∞	1-`
|nab|	nabla	∇	1-=
|or|	or	∧	6-`
|pd|	partial differential	∂	1-O-=
|perc|	percentage sign	%	T-S-5
|prop|	proportional	∝	1-S-`
|registrd|	registered	®	S-O-[
|therexists|	there exists	∃	S-S-4
|trademark|	trademark	™	T-O-2
|vrhash|	variant cross hash	⌘	3-[
|vrhash2|	variant cross hash 2	⦿	3-S-]
|vrhash3|	variant cross hash 3	⦿	5-S-O-b
|vrhash4|	variant cross hash 4	⦿	3-S-\
|vhbar|	variant bar h	ℏ	Op-S-u
|vperc|	variant percent	‰	T-S-O-r
|cdquote|	close double quote	”	T-S-O-[
|cquote|	close single quote	’	T-S-O-]
|oquote|	open double quote	“	T-O-[
|osquote|	open single quote	‘	T-O-]

|sum|	summation	Σ	[&|sum|&]
|dsum|	double summation	$\Sigma\Sigma$	[&|dsum|&]
|tsum|	triple summation	$\Sigma\Sigma\Sigma$	[&|tsum|&]
|smsum|	small summation	Σ	[&|smsum|&]
|smdsum|	small double sum	$\Sigma\Sigma$	[&|smdsum|&]
|smtsum|	small triple double summation	$\Sigma\Sigma\Sigma$	[&|smtsum|&]
|smint|	small integral	\int	[&|smint|&]
|smdint	small double integral	$\int\int$	[&|smdint|&]
|smtint|	small triple double integral	$\int\int\int$	[&|smtint|&]
|prod|	product	Π	[&|prod|&]
|dprod|	double product	$\Pi\Pi$	[&|dprod|&]
|tprod|	triple product	$\Pi\Pi\Pi$	[&|tprod|&]
|smprod|	small product	Π	[&|smprod|&]
|smdprod|	small double product	$\Pi\Pi$	[&|smdprod|&]
|smtprod|	small triple double product	$\Pi\Pi\Pi$	[&|smtprod|&]
|coprod|	coproduct	\amalg	[&|coprod|&]
|dcoprod|	double coproduct	$\amalg\amalg$	[&|dcoprod|&]
|tcoprod|	triple coproduct	$\amalg\amalg\amalg$	[&|tcoprod|&]
|smcoprod|	small coproduct	\amalg	[&|smcoprod|&]
|smdcoprod|	small double coproduct	$\amalg\amalg$	[&|smdcoprod|&]
|smtcoprod|	small triple coproduct	$\amalg\amalg\amalg$	[&|smtcoprod|&]
|unionplus|	union plus	\oplus	[&|unionplus|&]
|calrad|	calculator radical	$\sqrt{}$	3-S-O-q
|doint|	double o-integral	\oint	3-S-t
|intg|	integral sign	\int	3-S-3
|intbox|	integral box	\boxplus	3-a
|summ|	summation symbol	Σ	3-o
|circdot|	circle dot	\odot	6-S-9
|circeq|	circle equal open	\ominus	6-S-4
|circhse|	circle half solid east	\odot	6-g
|circhsw|	circle half solid west	\odot	6-f
|circminusc|	circle minus closed	\ominus	6-S-8
|circs|	circle solid	\bullet	6-d
|cirtimesc|	circle times closed	\oplus	6-S-5
|cirtimeso|	circle times open	\otimes	6-S-3
|circvbarc|	circle verical bar closed	\odot	6-S-7
|clubs|	clubs suit	\clubsuit	Sd-O-2
|diamo|	diamond open	\diamond	6-e

|diams|	diamond solid	◆	6-r
|diamsuit|	diamond suit	♦	S-O-r
|hearts|	heart	♥	S-O-g
|oplus|	O plus	⊕	6-S-1
|osqr|	open square	□	6-h
|ostar|	openstar	☆	6-q
|otimes|	O multiplication	⊗	6-S-3
|odot|	O dot	⊙	6-S-9
|ominus|	O minus	⊖	6-S-2
|rad|	radical sign	√	3-O-q
|spades|	spades	♠	S-O-2
|star|	star	★	6-w
|vcurE|	variant cursive capital E	ℰ	5-l
|vvectarrhead|	vector head	›	Op-S-1
|Weierp|	Weier p	℘	5-`

boldface math characters

|bfdeg|	boldface degree	°	4-8
|bfeset|	boldface empty set	∅	4-\
|bfexists|	boldface exists	∃	1-'
|bfforall|	boldface forall	∀	1-;
|bfinf|	boldface infinity	∞	4-`
|bfnabla|	boldface nabla	∇	4-=
|bfpd|	boldface partial differential	∂	4-O=
|bfprop|	boldface proportional to	∝	4-S-`

P r i m e s

|prime|	prime	'	1-9
|dprime|	double prime	"	1-0
|tprime|	triple prime	'''	1- -
|qprime|	quad prime	''''	Op-S-O-k

boldface primes

|bfprime|	boldface prime	'	4-9
|bfdprime|	boldface double prime	"	4-0
|bftprime|	boldface triple prime	'''	4- -
|bfqprime|	boldface quad prime	''''	[&|bfqprime|&]

Math Operators

23

+	plus	+	1-1
=	equal	=	1-5
-	minus	-	1-2

standard operators

|app|	approximate	\approx	3-S-O-,
|appreq|	approximately equal	\approx	3-.
|gtr|	greater than	$>$	1-.
|geq|	greater than and equal	\geq	1-S-4
|ggtr|	much greater	\gg	1-S-2
|pluscong|	plus congruent	$\dot{+}$	5-3
|pluseq|	plus equal	$\dot{=}$	5-1
|pminus|	plus minus	$\dot{+}$	1-6
|cong|	congruent	\equiv	3-S-.
|less|	less than	$<$	1-,
|leq|	less than equal	\leq	1-S-3
|lless|	much less	\ll	1-S-1
|mdot|	math dot	\cdot	4-S-/
|mplus|	minus plus	$\dot{+}$	1-7
|multi|	multiplication	\times	1-3
|ne|	not equal	\neq	1-S-O-5
|simil|	similar to	\sim	3-,
|sol|	solidus math slash	$/$	P-S-.

other operators

|bardash|	bar dash	\vdash	6-O-3
|bddashes|	back diagonal dashes	\diagup	2-O-4
|becas|	because	\because	6-S-[
|bul|	bullet	\bullet	4-S-/
|compo|	composition	\circ	6-S=
|congeq|	congruent equal	\equiv	3-S-.
|congtr|	congruent and greater	\gg	5-p
|congplus|	congruent and plus	$\dot{+}$	5-4
|dashbar|	dash bar	\dashv	6-O-4
|dashobar|	dash over bar	\dashv	6-O-2
|div|	division	\div	1-4
|dpara|	double parallel	\equiv	3-S-;
|eqgtr1|	equal and greater	\gg	5-r

Characters

|eqgtr|	equal to greater than	\equiv	5-y
|eqless|	equal less than	\equiv	5-t
|eqor|	equal or	\equiv	3-O-6
|eqplus|	equal to plus	\equiv	5-2
|equiv|	equivalent	\equiv	3-;
|fol|	follows	\Rightarrow	5-f
|forall|	for all	\forall	Sd-S-'
|geoeq|	geometrically equal	\cong	6-O-6
|geqleq|	greater than equal less than equal	\equiv	5-v
|gtrcong|	greater and congruent	\cong	1-S-8
|gtrless|	greater less	\cong	1-S- -
|gtrlesseq|	greater less equal	\equiv	5-n
|inters|	intersection	\cap	S-O-u
|leqgeq|	less equal greater equal	\equiv	5-b
|lesscong|	less and congruent	\cong	Op-f
|lessgrteq|	less greater equal	\equiv	5-m
|lessgtr|	less greater	\cong	1-S=
|rfloor|	right floor	\rfloor	P-S-k
|lfloor|	left floor	\lfloor	P-S-j
|rceil|	right ceiling	\rceil	P-S-m
|lceil|	left ceiling	\lceil	P-S-l
|link1|	link one	\sqcap	5-w
|link2|	link two	\sqcap	5-q
|logand|	logical and	\wedge	3-`
|logor|	logical or	\vee	3-S-`
|memb|	member of	\in	4-[
|namemb|	not a member of	\notin	4-O-[
|nappr|	not approximate	\approx	3-S-O-n
|nasub|	not a subset of	$\not\subset$	4-S-O-n
|neqgtr|	not equal greater	\neq	5-O-y
|neqless|	not equal less	\neq	5-O-t
|nequiv|	not equivalent	\neq	3-S-O-;
|nfol|	does not follow	\nrightarrow	5-O-s
|vnfol|	variant does not follow	\nrightarrow	5-S-O-s
|ngeq|	not greater equal	\ncong	1-S-O-7
|ngtr|	not greater	\nrightarrow	1-S-O-;
|ngtreq|	not greater than equal to	\ncong	5-S-.
|nidentical|	not identical	\neq	3-S-[
|nless|	not less	\nless	1-S-O-l

|nlesseq|	not less equal	\nless	5-S-,
|nleq2|	not less equal 2	$\nleq2$	1-S-O-3
|nmem|	not a member of	\ni	4-]
|nprec|	does not precede	\nprec	5-S-O-q
|nsim|	not similar	\nsim	3-S-O-j
|nsimi|	not similar	\nsimi	3-S-O-/
|nsup|	not a superset of	\nsup	4-S-O-/
|orbar|	or over bar	$\overline{\vee}$	3-O-4
|prec|	precedes	\prec	5-a
|propor|	proportion	\propto	6-S-,
|sub|	subset of	\subset	Op-S-9
|sup|	proper superset of	\supset	Op-S-0
|queseq|	question equals	$\stackrel{?}{=}$	6-0
|simless|	similar less than	\simless	5-u
|subgrp|	sub	\triangleleft	6-v
|subgrpof|	subgroup of	\triangleright	6-x
|subset|	proper subset	\subseteq	4-S-3
|subsup|	subset superset	\supseteq	4-S- -
|such|	such that	\ni	S-'
|supset|	proper superset	\supset	4-S-4
|thrfor|	therefore	\therefore	S-\
|uni|	union	\cup	O-S-O-e

variant operators

|vappeq|	variant approximate equal	\approx	3-S-/
|vappeq2|	variant approximaly equal 2	≈2	5-g
|vappeq3|	variant approximaly equal 3	≈3	5-h
|vconglless|	variant congruent less than	\lessapprox	1-S-7
|vneq|	variant not equal to	\napprox	Op-S-z
|veq|	variant equal	$\stackrel{*}{=}$	6- -
|veq2|	variant equal 2	$\stackrel{2}{=}$	6-8
|veq3|	variant equal 3	$\stackrel{3}{=}$	6-9
|veq4|	variant equal 4	$\stackrel{4}{=}$	6-7
|veq5|	variant equal 5	$\stackrel{5}{=}$	6-6
|veq6|	variant equal 6	$\stackrel{6}{=}$	6-5
|veq7|	variant equal 7	$\stackrel{7}{=}$	Op-S-j
|veqor|	variant equal or	$\overline{\wedge}$	3-O-3
|vequals|	variant or equals	\triangleq	6-=
|vequals2|	variant or equals 2	$\triangle2$	5-0
|vfol|	variant follows	\succcurlyeq	5-f

|vgeq|	variant greater equal	\geq	1-S-
|vgeq2|	variant greater equal 2	\geq	1-S-6
|vgtr|	variant greater than	$>$	5-S-s
|vlless|	variant much less	\ll	Op-S-v
|vggtr|	variant much greater	\gg	Op-S-w
|vgtrcon|	variant greater congruent	\geq	1-S-0
|vgtrless|	variant greater than less than	\geq	5-x
|vleq|	variant less equal	\leq	1-S-5
|vleq2|	variant less equal 2	\leq	1-S-,
|vleq3|	variant less equal 3	\leq	5-e
|vleq4|	variant less equal 3	\neq	5-S-O-r
|vleqqeq|	variant less eq greater eq	\geq	5-c
|vless|	variant less than	$<$	1-,
|vless2|	variant less than 2	$<$	5-S-a
|vlesscon|	variant less congruent	\leq	1-S-9
|vmem|	variant element	\in	5-5
|vminus|	variant minus	$\dot{-}$	6-1
|vminus2|	variant minus 2	$\dot{-}$	6-2
|vminus3|	variant minus 3	$\dot{-}$	6-3
|vminus4|	variant minus 4	\div	6-4
|vnappeq|	variant not approx equal	\neq	3-O-
|vnappeq2|	variant not approx equal 2	\neq	5-O-` + 1
|vnappeq3|	variant not approx equal 3	\neq	3-O-'
|vncongeq|	variant not congruent equal	\neq	5-S-O-h
|vncongeq2|	variant not congruent equal 2	\neq	3-S-O-l
|vne|	variant not equal	\neq	3-[
|vne2|	variant not equal 2	\neq	5-O- -
|vneqcong|	variant not equal congruent	\neq	3-O-/
|vneqgtr|	variant not equal greater	\neq	5-S-O-y
|vneqgtr2|	variant not equal greater 2	\neq	5-S-O-m
|vnequiv|	variant not equivalent	\neq	3-O-m
|vneqlless|	variant not equal less than	\neq	5-O-i + S-e
|vneqlless2|	variant not equal less than 2	\neq	5-S-O-u
|vnfoll|	variant does not follow 2	\neq	5-S-O-f
|vnfoll2|	variant does not follow	\neq	5-O-f
|vngrt|	variant not greater than	$>$	5-,
|vngeq|	variant not greater equal	\neq	1-S-O-/
|vngeq2|	variant not greater equal 2	\neq	1-O-6
|vngeq3|	variant not greater equal 3	\neq	1-O-7

|vnleq|	variant not less equal	\nless	1-S-O-n
|vnleq2|	variant not less equal 2	\nless_2	1-O-m
|vnleq3|	variant not less equal 3	\nless_3	1-S-O-4
|vnleq4|	variant not less equal 4	\nless_4	1-O-4
|vnleq5|	variant not less equal 5	\nless_5	1-O-3
|vnmem|	variant not a member	\nmem	5-6
|vnmem2|	variant not member 2	\nmem_2	5-O-6
|vnprec|	variant does not precede	\nprec	5-S-O-d
|vnprec2|	variant does not precede 2	\nprec_2	5-O-a
|vnsim|	variant not similar	\nsim	5-S-;
|vnsim2|	variant not similar2	\nsim_2	5-S-O-/
|vnsim3|	variant not similar3	\nsim_3	3-O-,
|vnsub|	variant not subset	\nsubset	4-S-O-n
|vnsub2|	variant not subset 2	\nsubset_2	5-S-O-7
|vnsub3|	variant not subset 3	\nsubset_3	4-S-O-3
|vnsub4|	variant not subset 4	\nsubset_4	5-O-7
|vnsup|	variant not a superset	\nsupset	4-S-O-4
|vnsub2|	variant not a superset 2	\nsupset_2	5-O-8
|vnsub3|	variant not a superset 3	\nsupset_3	4-S=
|voreq|	variant or equals	\veq	3-O-4
|vprec|	variant precedes	\preceq	5-d
|vprop|	variant proportion	\propto	6-S-O-,
|vsim|	variant similar	\sim	5-j
|vsim2|	variant similar 2	\sim_2	5-k
|vsub|	variant subset	\subseteq	4-S-1
|vsub2|	variant subset 2	\subseteq_2	4-S-9
|vsub3|	variant subset 3	\subseteq_3	5-7
|vsub4|	variant subset 4	\subseteq_4	4-S-7
|vsub5|	variant subset 5	\subseteq_5	4-S-5
|vsup|	variant superset	\supseteq	4-S-2
|vsup2|	variant superset 2	\supseteq_2	4-S-0
|vsup3|	variant superset 3	\supseteq_3	5-8
|vsup4|	variant superset 4	\supseteq_4	4-S-8
|vsup5|	variant superset 5	\supseteq_5	4-S-6
|vunion|	variant union	\cup	4-S-O-,

boldface operators

|bfdiv|	boldface division	\div	4-4
|bfdot|	boldface dots	\cdot	4-S-/
|bfeq|	boldface equal	$=$	4-5
|bfinter|	boldface intersection	\cap	4-S-'

|bfmplus|	boldface minus plus	\mp	4-7
|bfminus|	boldface minus	$-$	4-2
|bfmulti|	boldface multiplication	\times	4-3
|bfne|	boldface not equal to	\neq	4-S-O-5
|bfplus|	boldface plus	$+$	4-1
|bfpmin|	boldface plus minus	\pm	4-6
|bfsol|	boldface solidus	$/$	4-/
|bfsub|	boldface subset	\subset	4-;
|bfsupset|	boldface superset	\supset	4-1
|bfthere|	boldface there exists	\exists	1-'
|bfunion|	boldface union	\cup	4-S-;

limit operators

|plusns|	plus with no space	$+$	[&|plusns&]
|minusns|	minus with no space	$-$	[&|minusns|&]
|eqns|	equal with no space	$=$	[&|eqns|&]
|appns|	approximate with no space	\approx	[&|appns|&]
|mplusns|	minusplus with no space	\mp	[&|mplusns|&]
|pminusns|	plusminus with no space	\pm	[&|pminusns|&]

Arrows

|darr|	down arrow	\downarrow	Op-S-t
|dlarr|	down left arrow	\swarrow	Op-b
|larr|	left arrow	\leftarrow	Op-d
|map|	mapso arrow	\mapsto	2-O5
|odarr|	open down arrow	\Downarrow	Op-2
|olarr|	open left arrow	\Leftarrow	Op-S-b
|olrarr|	open left right arrow	\Leftrightarrow	Op-3
|orarr|	open right arrow	\Rightarrow	Op-1
|ouarr|	open up arrow	\Uparrow	Op-S-a
|oudarr|	open up down arrow	\Updownarrow	Op-S-c
|rarr|	right arrow	\rightarrow	Op-S-s
|rlarr|	right left arrow	\leftrightarrow	Op-4
|uarr|	up arrow	\uparrow	Op-c
|udarr|	up down arrow	\Updownarrow	Op-S-d
|vrarr|	variant right arrow	\rightsquigarrow	5-S-v
|lgrarr|	long right arrow	\longrightarrow	Op-O-1
|lglarr|	long left arrow	\longleftarrow	Op-S-O- -
|lglrarr|	long left right arrow	\longleftrightarrow	Op-S-O-9

|lgarr|	long up arrow	to come	arrow
|lgdarr|	long down arrow	to come	arrow
|lgorarr|	long open right arrow	to come	arrow
|lgolarr|	long open left arrow	to come	arrow
|lgolrarr|	long open left right arrow	to come	arrow
|lgouarr|	long open up arrow	to come	arrow
|lgodarr|	long open down arrow	to come	arrow

C h e m i s t r y

|bond|	bond	—	Op-O-l
|dbond|	double bond	=	Op-O-[
|tbond|	triple bond	≡	Op-S-O-0
|vbond|	vertical bond	|	Op-O-f
|vdbond|	vertical double bond	||	Op-O-]
|vtbond|	vertical triple bond	|||	Op-S-O-r
|dibond|	diagonal bond	/	Op-O-v
|didbond|	diagonal double bond	//	Op-S-O-[
|ditbond|	diagonal triple bond	///	Op-S-O-w
|bdibond|	back diagonal bond	\	Op-O-x
|bdidbond|	back diagonal double bond	\\	Op-S-O-]
|bditbond|	back diagonal triple bond	\\\	Op-S-O-m

C h a l k b o a r d B o l d

~cbb~A~norm~	chalkboard bold	A	6-S-a
~cbb~B~norm~	chalkboard bold	B	6-S-b
~cbb~C~norm~	chalkboard bold	C	6-S-c
~cbb~D~norm~	chalkboard bold	D	6-S-d
~cbb~E~norm~	chalkboard bold	E	6-S-e
~cbb~F~norm~	chalkboard bold	F	6-S-f
~cbb~G~norm~	chalkboard bold	G	6-S-g
~cbb~H~norm~	chalkboard bold	H	6-S-h
~cbb~I~norm~	chalkboard bold	I	6-S-i
~cbb~J~norm~	chalkboard bold	J	6-S-j
~cbb~K~norm~	chalkboard bold	K	6-S-k
~cbb~L~norm~	chalkboard bold	L	6-S-l
~cbb~M~norm~	chalkboard bold	M	6-S-m
~cbb~N~norm~	chalkboard bold	N	6-S-n
~cbb~O~norm~	chalkboard bold	O	6-S-o
~cbb~P~norm~	chalkboard bold	P	6-S-p

~cbb~Q~norm~	chalkboard bold	Q	6-S-q
~cbb~R~norm~	chalkboard bold	R	6-S-r
~cbb~S~norm~	chalkboard bold	S	6-S-s
~cbb~T~norm~	chalkboard bold	T	6-S-t
~cbb~U~norm~	chalkboard bold	U	6-S-u
~cbb~V~norm~	chalkboard bold	V	6-S-v
~cbb~W~norm~	chalkboard bold	W	6-S-w
~cbb~X~norm~	chalkboard bold	X	6-S-x
~cbb~Y~norm~	chalkboard bold	Y	6-S-y
~cbb~Z~norm~	chalkboard bold	Z	6-S-z

Remember to reset the style back to normal. “~norm~”

Fancy Characters

~fancy~A~norm~	fancy A	A	F-S-a
~fancy~B~norm~	fancy B	B	F-S-b
~fancy~C~norm~	fancy C	C	F-S-c
~fancy~D~norm~	fancy D	D	F-S-d
~fancy~E~norm~	fancy E	E	F-S-e
~fancy~F~norm~	fancy F	F	F-S-f
~fancy~G~norm~	fancy G	G	F-S-g
~fancy~H~norm~	fancy H	H	F-S-h
~fancy~I~norm~	fancy I	I	F-S-i
~fancy~J~norm~	fancy J	J	F-S-j
~fancy~K~norm~	fancy K	K	F-S-k
~fancy~L~norm~	fancy L	L	F-S-l
~fancy~M~norm~	fancy M	M	F-S-m
~fancy~N~norm~	fancy N	N	F-S-n
~fancy~O~norm~	fancy O	O	F-S-o
~fancy~P~norm~	fancy P	P	F-S-p
~fancy~Q~norm~	fancy Q	Q	F-S-q
~fancy~R~norm~	fancy R	R	F-S-r
~fancy~S~norm~	fancy S	S	F-S-s
~fancy~T~norm~	fancy T	T	F-S-t
~fancy~U~norm~	fancy U	U	F-S-u
~fancy~V~norm~	fancy V	V	F-S-v
~fancy~W~norm~	fancy W	W	F-S-w
~fancy~X~norm~	fancy X	X	F-S-x
~fancy~Y~norm~	fancy Y	Y	F-S-y
~fancy~Z~norm~	fancy Z	Z	F-S-z

Script Characters

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~fancy~a~norm~	script A	\mathcal{A}	F-a
~fancy~b~norm~	script B	\mathcal{B}	F-b
~fancy~c~norm~	script C	\mathcal{C}	F-c
~fancy~d~norm~	script D	\mathcal{D}	F-d
~fancy~e~norm~	script E	\mathcal{E}	F-e
~fancy~f~norm~	script F	\mathcal{F}	F-f
~fancy~g~norm~	script G	\mathcal{G}	F-g
~fancy~h~norm~	script H	\mathcal{H}	F-h
~fancy~i~norm~	script I	\mathcal{I}	F-i
~fancy~j~norm~	script J	\mathcal{J}	F-j
~fancy~k~norm~	script K	\mathcal{K}	F-k
~fancy~l~norm~	script L	\mathcal{L}	F-l
~fancy~m~norm~	script M	\mathcal{M}	F-m
~fancy~n~norm~	script N	\mathcal{N}	F-n
~fancy~o~norm~	script O	\mathcal{O}	F-o
~fancy~p~norm~	script P	\mathcal{P}	F-p
~fancy~q~norm~	script Q	\mathcal{Q}	F-q
~fancy~r~norm~	script R	\mathcal{R}	F-r
~fancy~s~norm~	script S	\mathcal{S}	F-s
~fancy~t~norm~	script T	\mathcal{T}	F-t
~fancy~u~norm~	script U	\mathcal{U}	F-u
~fancy~v~norm~	script V	\mathcal{V}	F-v
~fancy~w~norm~	script W	\mathcal{W}	F-w
~fancy~x~norm~	script X	\mathcal{X}	F-x
~fancy~y~norm~	script Y	\mathcal{Y}	F-y
~fancy~z~norm~	script Z	\mathcal{Z}	F-z

Remember to reset the style to normal “~norm~”

|scriptbarh|	script bar h	\hbar	Op-S-u
|barel|	script bar el	ℓ	2-.
|barL|	script bar L	\mathcal{L}	2-]
|scriptel|	script el	ℓ	O-/

boldface script characters

|bfscriptbare|	boldface bar script el	ℓ	2-S-.
|bfscriptel|	boldface script el	ℓ	2-S-,
|bfscriptg|	boldface script g	\mathfrak{g}	2-S-;
|bfscripth|	boldface script h	\mathfrak{h}	2-S-'
|bfscripty|	boldface script y	\mathfrak{y}	2-=
|bfscriptz|	boldface script z	\mathfrak{z}	2-S-/

Characters

Special Characters

32

|alph|	aleph	ℵ	1-:
~frak~A~norm~	fraktur A	ℑ	2-S-a
~frak~a~norm~	fraktur a	ɑ	2-a
~frak~B~norm~	fraktur B	℔	2-S-b
~frak~b~norm~	fraktur b	ℬ	2-b
~frak~C~norm~	fraktur C	℔	2-S-c
~frak~c~norm~	fraktur c	℔	2-c
~frak~D~norm~	fraktur D	℔	2-S-d
~frak~d~norm~	fraktur d	℔	2-d
~frak~E~norm~	fraktur E	℔	2-S-e
~frak~e~norm~	fraktur e	℔	2-e
~frak~F~norm~	fraktur F	℔	2-S-f
~frak~f~norm~	fraktur f	℔	2-f
~frak~G~norm~	fraktur G	℔	2-S-g
~frak~g~norm~	fraktur g	℔	2-g
~frak~H~norm~	fraktur H	℔	2-S-h
~frak~h~norm~	fraktur h	℔	2-h
~frak~I~norm~	fraktur I	℔	2-S-i
~frak~i~norm~	fraktur i	℔	2-i
~frak~J~norm~	fraktur J	℔	2-S-j
~frak~j~norm~	fraktur j	℔	2-j
~frak~K~norm~	fraktur K	℔	2-S-k
~frak~k~norm~	fraktur k	℔	2-k
~frak~L~norm~	fraktur L	℔	2-S-l
~frak~l~norm~	fraktur l	℔	2-l
~frak~M~norm~	fraktur M	℔	2-S-m
~frak~m~norm~	fraktur m	℔	2-m
~frak~N~norm~	fraktur N	℔	2-S-n
~frak~n~norm~	fraktur n	℔	2-n
~frak~O~norm~	fraktur O	℔	2-S-o
~frak~o~norm~	fraktur o	℔	2-o
~frak~P~norm~	fraktur P	℔	2-S-p
~frak~p~norm~	fraktur p	℔	2-p
~frak~Q~norm~	fraktur Q	℔	2-S-q
~frak~q~norm~	fraktur q	℔	2-q
~frak~R~norm~	fraktur R	℔	2-S-r
~frak~r~norm~	fraktur r	℔	2-r

Characters

~frak~S~norm~	fraktur S	Ⓕ	2-S-s
~frak~s~norm~	fraktur s	Ⓢ	2-s
~frak~T~norm~	fraktur T	⒢	2-S-t
~frak~t~norm~	fraktur t	Ⓣ	2-t
~frak~U~norm~	fraktur U	Ⓤ	2-S-u
~frak~u~norm~	fraktur u	Ⓤ	2-u
~frak~V~norm~	fraktur V	⒲	2-S-v
~frak~v~norm~	fraktur v	Ⓥ	2-v
~frak~W~norm~	fraktur W	⒲	2-S-w
~frak~w~norm~	fraktur w	Ⓦ	2-w
~frak~X~norm~	fraktur X	⒪	2-S-x
~frak~x~norm~	fraktur x	Ⓝ	2-x
~frak~Y~norm~	fraktur Y	Ⓨ	2-S-y
~frak~y~norm~	fraktur y	Ⓨ	2-y
~frak~Z~norm~	fraktur Z	Ⓑ	2-S-z
~frak~z~norm~	fraktur z	Ⓩ	2-z

Large Characters

|lgprime|	large prime	'	Op-O-q
|lgdprime|	large double prime	"	Op-S-O-6
|lgtprime|	large triple prime	'''	Op-S-O-j
|lgqprime|	large quad prime	''''	Op-S-O-t
|lgast|	large asterisk	*	[&|lgast|&]
|lgor|	large or	^	3-`
|lgdeg|	large degree	°	[&|lgdeg|&]

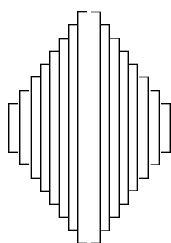
Note: Used in some PowerMath 4.0 procedures

Radical Indices

|index3|	radical index 3	³	[&|index3|&]
|index5|	radical index 5	⁵	[&|index5|&]
|index7|	radical index 7	⁷	[&|index7|&]
|index9|	radical index 9	⁹	[&|index9|&]
|smidx3|	small radical index 3	³	[&|smidx3|&]
|indexn|	radical index n	ⁿ	[&|indexn|&]
|indexm|	radical index m	ᵐ	[&|indexm|&]
|indexo|	radical index o	ᵒ	[&|indexo|&]
|indexp|	radical index p	ᵖ	[&|indexp|&]
|indexq|	radical index q	ᵑ	[&|indexq|&]

square braces

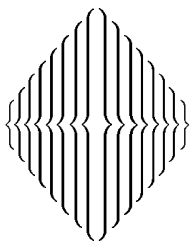
|msbo|	matrix square brace open	[&|msbo|&]
|msbc|	matrix square brace close	[&|msbc|&]
|3msbo|	matrix square brace open	[&|3msbo|&]
|3msbc|	matrix square brace close	[&|3msbc|&]
|4msbo|	matrix square brace open	[&|4msbo|&]
|4msbc|	matrix square brace close	[&|4msbc|&]
|5msbo|	matrix square brace open	[&|5msbo|&]
|5msbc|	matrix square brace close	[&|5msbc|&]
|6msbo|	matrix square brace open	[&|6msbo|&]
|6msbc|	matrix square brace close	[&|6msbc|&]
|7msbo|	matrix square brace open	[&|7msbo|&]
|7msbc|	matrix square brace close	[&|7msbc|&]
|8msbo|	matrix square brace open	[&|8msbo|&]
|8msbc|	matrix square brace close	[&|8msbc|&]
|9msbo|	matrix square brace open	[&|9msbo|&]
|9msbc|	matrix square brace close	[&|9msbc|&]



curly braces

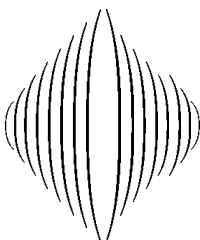
|mcbo|	matrix curly brace open	[&|mcbo|&]
|mcbc|	matrix curly brace close	[&|mcbc|&]
|3mcbo|	matrix curly brace open	[&|3mcbo|&]
|3mcbc|	matrix curly brace close	[&|3mcbc|&]
|4mcbo|	matrix curly brace open	[&|4mcbo|&]
|4mcbc|	matrix curly brace close	[&|4mcbc|&]
|5mcbo|	matrix curly brace open	[&|5mcbo|&]
|5mcbc|	matrix curly brace close	[&|5mcbc|&]
|6mcbo|	matrix curly brace open	[&|6mcbo|&]
|6mcbc|	matrix curly brace close	[&|6mcbc|&]
|7mcbo|	matrix curly brace open	[&|7mcbo|&]
|7mcbc|	matrix curly brace close	[&|7mcbc|&]
|8mcbo|	matrix curly brace open	[&|8mcbo|&]

|8mcbc|	matrix curly brace close	[&|8mcbc|&]
|9mcbo|	matrix curly brace open	[&|9mcbo|&]
|9mcbc|	matrix curly brace close	[&|9mcbc|&]



parenthesis braces

|mpbo|	matrix parathesis brace open	[&|mpbo|&]
|mpbc|	matrix parathesis brace close	[&|mpbc|&]
|3mpbo|	matrix parathesis brace open	[&|3mpbo|&]
|3mpbc|	matrix parathesis brace close	[&|3mpbc|&]
|4mpbo|	matrix parathesis brace open	[&|4mpbo|&]
|4mpbc|	matrix parathesis brace close	[&|4mpbc|&]
|5mpbo|	matrix parathesis brace open	[&|5mpbo|&]
|5mpbc|	matrix parathesis brace close	[&|5mpbc|&]
|6mpbo|	matrix parathesis brace open	[&|6mpbo|&]
|6mpbc|	matrix parathesis brace close	[&|6mpbc|&]
|7mpbo|	matrix parathesis brace open	[&|7mpbo|&]
|7mpbc|	matrix parathesis brace close	[&|7mpbc|&]
|8mpbo|	matrix parathesis brace open	[&|8mpbo|&]
|8mpbc|	matrix parathesis brace close	[&|8mpbc|&]
|9mpbo|	matrix parathesis brace open	[&|9mpbo|&]
|9mpbc|	matrix parathesis brace close	[&|9mpbc|&]



straight braces

|mstbo|	matrix straight brace open	[&|mstbo|&]
|mstbc|	matrix straight brace close	[&|mstbc|&]
|3mstbo|	matrix straight brace open	[&|3mstbo|&]
|3mstbc|	matrix straight brace close	[&|3mstbc|&]
|4mstbo|	matrix straight brace open	[&|4mstbo|&]

|4mstbc|	matrix straight brace close	[&|4mstbc|&]
|5mstbo|	matrix straight brace open	[&|5mstbo|&]
|5mstbc|	matrix straight brace close	[&|5mstbc|&]
|6mstbo|	matrix straight brace open	[&|6mstbo|&]
|6mstbc|	matrix straight brace close	[&|6mstbc|&]
|7mstbo|	matrix straight brace open	[&|7mstbo|&]
|7mstbc|	matrix straight brace close	[&|7mstbc|&]
|8mstbo|	matrix straight brace open	[&|8mstbo|&]
|8mstbc|	matrix straight brace close	[&|8mstbc|&]
9mstbo	matrix straight brace open	[& 9mstbo &]
9mstbc	matrix straight brace close	[& 9mstbc &]



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7 level radical	*septrad*	3	boldface dots.....	bfdot	27
8 level radical	*octrad*	3	boldface double prime.....	bfdprime	22
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absolute value bar open.....	abso	14	boldface epsilon.....	bfeps	18
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alignment space.....	*AS*	11	boldface exists.....	bfexists	22
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boldface capital Nu.....	bfNu	18	boldface zeta.....	bfzeta	19
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fraktur d.....	~frak~d	32
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