

Help: Wiki Math

The Wiki supports [LaTeX](#) markup: $\pi = \frac{3}{4} \sqrt{3} + 24 \int_0^{1/4} \sqrt{x-x^2} dx$

Mathematical Formula ([LaTeX](#)) can be inserted into text like this:

```
<math>Insert formula here</math>
```

For example:

```
<math>\alpha^2 + \beta^2 = 1</math>
```

...displays $\alpha^{2+\beta} = 1$

Displaying a Formula

The Wiki uses a subset of [TeX](#) markup, including some extensions from [LaTeX](#) and [AMSLaTeX](#), for mathematical formulae. It generates either PNG images or simple HTML markup, depending on the complexity of the expression. While it can generate [MathML](#), it is not currently used due to limited browser support. As browsers become more advanced and support for [MathML](#) becomes more wide-spread, this could be the preferred method of output as images have very real disadvantages.

Syntax

Math markup goes inside `$...$`.

Pros of

Pros of [TeX](#)

`x}}}`" means "mathematical variable `x`", whereas in HTML "`{`
`{{x`

“ could mean anything. Information has been irrevocably lost.

Example Formulas

The following are a few examples of formulas:

`$sqrt{1-e^2}$`

`sqrt{1-e^2}`

`$overbrace{ 1+2+cdots+100 }^{5050}$`

`overbrace{ 1+2+cdots+100 }^{5050}`

`$ax^2 + bx + c = 0$`

`ax^2 + bx + c = 0`

`$int_{-N}^N e^x, dx$`

`int_{-N}^N e^x, dx`

Functions, symbols, special characters

Accents/Diacritics

`acute{a} grave{a} hat{a} tilde{a} breve{a} acute{a} grave{a} hat{a} tilde{a} breve{a} check{a}`
`bar{a} ddot{a} dot{a} check{a} bar{a} ddot{a} dot{a}`

Standard functions

`sin a cos b tan c sin a cos b tan c sec d csc e cot f sec d csc e cot f,! arcsin h arccos i arctan j`
`arcsin h arccos i arctan j,! sinh k cosh l tanh m coth n sinh k cosh l tanh m coth n`
`operatorname{sh},o,operatorname{ch},p,operatorname{th},q`
`operatorname{sh},o,operatorname{ch},p,operatorname{th},q`

operatorname{arsinh},r,operatorname{arcosh},s,operatorname{artanh},t
operatorname{arsinh},r,operatorname{arcosh},s,operatorname{artanh},t,! lim u limsup v liminf w
min x max y lim u limsup v liminf w min x max y inf z sup a exp b ln c lg d log e log_{10} f ker g
inf z sup a exp b ln c lg d log e log_{10} f ker g deg h gcd i Pr j det k hom l arg m dim n deg h
gcd i Pr j det k hom l arg m dim n,!

Modular arithmetic

$s_k \equiv 0 \pmod{m}$ $s_k \equiv 0 \pmod{m},! a,b \bmod b$ $a,b \bmod b,!$

Derivatives

∇ , partial x, dx, dot x, ddot y, dy/dx, $\frac{dy}{dx}$, $\frac{\partial^2 y}{\partial x_1 \partial x_2}$
 ∇ , partial x, dx, dot x, ddot y, dy/dx, $\frac{dy}{dx}$, $\frac{\partial^2 y}{\partial x_1 \partial x_2}$

Sets

forall exists empty emptyset varnothing forall exists empty emptyset varnothing,! in ni not in
notin subset subseteq supset supseteq in ni not in notin subset subseteq supset supseteq,! cap
bigcap cup bigcup biguplus setminus smallsetminus cap bigcap cup bigcup biguplus setminus
smallsetminus,! sqsubset sqsubseteq sqsupset sqsupseteq sqcap sqcup bigsqcup sqsubset
sqsubseteq sqsupseteq sqcap sqcup bigsqcup,!

Operators

+ oplus bigoplus pm mp - + oplus bigoplus pm mp –,! times otimes bigotimes cdot circ bullet
bigodot times otimes bigotimes cdot circ bullet bigodot,! star * / div frac{1}{2} star * / div
frac{1}{2},!

Logic

land (or and) wedge bigwedge bar{q} to p land wedge bigwedge bar{q} to p,! lor vee bigvee lnot
neg q And lor vee bigvee lnot neg q And,!

Root

$\sqrt{2}$ $\sqrt[n]{x}$ $\sqrt{2}$ $\sqrt[n]{x},!$

Relations

sim approx simeq cong dot= overset{underset{\mathrm{def}}{}}{=} sim approx simeq cong dot=
overset{underset{\mathrm{def}}{}}{=},! le < ll gg ge > equiv notequiv ne mbox{or} neq propto le <
ll gg ge > equiv notequiv ne mbox{or} neq propto,!

Geometric

Diamond Box triangle angle perp mid nmid | 45^{circ} Diamond , Box , triangle , angle perp , mid ; nmid , | 45^{circ}!

Arrows

leftarrow (or gets) rightarrow (or to) nleftarrow notto leftrightarrow nletrightarrow longleftarrow longrightarrow longleftrightarrow leftarrow rightarrow nleftarrow notto leftrightarrow nletrightarrow longleftarrow longrightarrow longleftrightarrow ,! Leftarrow Rightarrow nLeftarrow nRightarrow Leftrightarrow nLeftrightarrow Longleftarrow Longrightarrow Longleftrightarrow (or iff) Leftarrow Rightarrow nLeftarrow nRightarrow Leftrightarrow nLeftrightarrow Longleftarrow Longrightarrow Longleftrightarrow ,! uparrow downarrow updownarrow Uparrow Downarrow Updownarrow nearrow searrow swarrow nwarrow uparrow downarrow updownarrow Uparrow Downarrow Updownarrow nearrow searrow swarrow nwarrow rightharpoonup rightharpoondown leftharpoonup leftharpoondown upharpoonleft upharpoonright downharpoonleft downharpoonright rightharpoons leftrightharpoons rightharpoonup rightharpoondown leftharpoonup leftharpoondown upharpoonleft upharpoonright downharpoonleft downharpoonright rightharpoons leftrightharpoons ,! curvearrowleft circlearrowleft Lsh upuparrows rightrightarrows rightharpoons Rightarrow rightarrowtail looparrowright curvearrowleft circlearrowleft Lsh upuparrows rightrightarrows rightharpoons Rrightarrow rightarrowtail looparrowright ,! curvearrowright circlearrowright Rsh downdownarrows leftleftarrows leftrightarrows Lleftarrow leftarrowtail looparrowleft curvearrowright circlearrowright Rsh downdownarrows leftleftarrows leftrightarrows Lleftarrow leftarrowtail looparrowleft ,! mapsto longmapsto hookrightarrow hookleftarrow multimap leftrightsquigarrow rightsquigarrow mapsto longmapsto hookrightarrow hookleftarrow multimap leftrightsquigarrow rightsquigarrow ,!

Special

And eth S P % dagger ddagger ldots cdots And eth S P % dagger ddagger ldots cdots,! smile frown wr triangleleft triangleright infy bot top smile frown wr triangleleft triangleright infy bot top,! vdash vDash Vdash models lVert rVert imath hbar vdash vDash Vdash models lVert rVert imath hbar,! ell mho Finv Re Im wp complement ell mho Finv Re Im wp complement,! diamondsuit heartsuit clubsuit spadesuit Game flat natural sharp diamondsuit heartsuit clubsuit spadesuit Game flat natural sharp,!

Unsorted (new stuff)

vartriangle triangledown lozenge circledS measuredangle nexists Bbbk backprime blacktriangle blacktriangledown vartriangle triangledown lozenge circledS measuredangle nexists Bbbk backprime blacktriangle blacktriangledown blacksquare blacklozenge bigstar sphericalangle diagup diagdown dotplus Cap Cup barwedge blacksquare blacklozenge bigstar sphericalangle diagup diagdown dotplus Cap Cup barwedge veebar doublebarwedge boxminus boxtimes boxdot boxplus divideontimes ltimes rtimes leftthreetimes veebar doublebarwedge boxminus

boxtimes boxdot boxplus divideontimes ltimes rtimes leftthreetimes rightthreetimes curlywedge
 curlyvee circleddash circledast circledcirc centerdot intercal leqq leqslant rightthreetimes
 curlywedge curlyvee circleddash circledast circledcirc centerdot intercal leqq leqslant
 eqslantless lessapprox approx eq lessdot III lessgtr lesseqgtr lesseqqgtr doteqdot risingdotseq
 eqslantless lessapprox approx eq lessdot III lessgtr lesseqgtr lesseqqgtr doteqdot risingdotseq
 fallingdotseq backsim backsimeq subseteqq Subset preccurlyeq curlyeqprec precsim
 precapprox vartriangleleft fallingdotseq backsim backsimeq subseteqq Subset preccurlyeq
 curlyeqprec precsim precapprox vartriangleleft Vvdash bumpeq Bumpeq geqq geqslant
 eqslantgtr gtrsim gtrapprox eqsim gtrdot Vvdash bumpeq Bumpeq geqq geqslant eqslantgtr
 gtrsim gtrapprox eqsim gtrdot ggg gtrless gtreqless gtreqqless eqcirc circeq triangleq thicksim
 thickapprox supseteqq ggg gtrless gtreqless gtreqqless eqcirc circeq triangleq thicksim
 thickapprox supseteqq Supset succurlyeq curlyeqsucc succsim succapprox vartriangleright
 shortmid shortparallel between pitchfork Supset succurlyeq curlyeqsucc succsim succapprox
 vartriangleright shortmid shortparallel between pitchfork varpropto blacktriangleleft therefore
 backepsilon blacktriangleright because nleqslant nleqq lneq lneqq varpropto blacktriangleleft
 therefore backepsilon blacktriangleright because nleqslant nleqq lneq lneqq lvertneqq Insim
 Inapprox nprec npreceq precneqq precsim precnapprox nsim nshortmid lvertneqq Insim
 Inapprox nprec npreceq precneqq precsim precnapprox nsim nshortmid nvdash nVdash
 ntriangleleft ntrianglelefteq nsubseteq nsubseteqq varsubsetneq subsetneqq varsubsetneqq
 ngrtr nvdash nVdash ntriangleleft ntrianglelefteq nsubseteq nsubseteqq varsubsetneq
 subsetneqq varsubsetneqq ngrtr subsetneq subsetneq ngeqslant ngeqq gneq gneqq gvertneqq
 gnsim gnapprox nsucc nsucceq succneqq ngeqslant ngeqq gneq gneqq gvertneqq gnsim
 gnapprox nsucc nsucceq succneqq succnsim succnapprox ncong nshortparallel nparallel
 nVDash nVDash ntriangleright ntrianglerighteq nsupseteq succnsim succnapprox ncong
 nshortparallel nparallel nVDash nVDash ntriangleright ntrianglerighteq nsupseteq nsupseteqq
 varsupsetneq supsetneqq varsupsetneqq nsupseteqq varsupsetneq supsetneqq varsupsetneqq
 jmath surd ast uplus diamond bigtriangleup bigtriangledown ominus jmath surd ast uplus
 diamond bigtriangleup bigtriangledown ominus,! oslash odot bigcirc amalg prec succ preceq
 succeq oslash odot bigcirc amalg prec succ preceq succeq,! dashv asymp doteq parallel dashv
 asymp doteq parallel,! ulcorner urcorner llcorner lrcorner ulcorner urcorner llcorner lrcorner

Larger Expressions

Parenthesizing big expressions, brackets, bars

Feature Syntax How it looks rendered Bad $(\frac{1}{2}) (\frac{1}{2})$ Good $\left(\frac{1}{2} \right)$
 $\left(\frac{1}{2} \right)$

You can use various delimiters with left and right:

Feature Syntax How it looks rendered Parentheses $\left(\frac{a}{b} \right)$ $\left(\frac{a}{b} \right)$
) Brackets $\left[\frac{a}{b} \right]$ $\left[\frac{a}{b} \right]$ quad $\left\lbrack \frac{a}{b} \right\rbrack$ $\left\lbrack \frac{a}{b} \right\rbrack$ right [right](#) quad $\left\lbrack \frac{a}{b} \right\rbrack$ right $\left\lbrack \frac{a}{b} \right\rbrack$
 Braces $\left\{ \frac{a}{b} \right\}$ $\left\{ \frac{a}{b} \right\}$ quad $\left\{ \frac{a}{b} \right\}$ right $\left\{ \frac{a}{b} \right\}$ right $\left\{ \frac{a}{b} \right\}$ right } quad $\left\{ \frac{a}{b} \right\}$ right $\left\{ \frac{a}{b} \right\}$ right rbrace Angle brackets $\left\langle \frac{a}{b} \right\rangle$ right
 rangle $\left\langle \frac{a}{b} \right\rangle$ right rangle Bars and double bars $\left| \frac{a}{b} \right|$ right $\left| \frac{a}{b} \right|$ right $\left| \frac{a}{b} \right|$ right

$\frac{c}{d}$ right | left | $\frac{a}{b}$ right vert left Vert $\frac{c}{d}$ right | Floor and ceiling functions: left
 $\lfloor \frac{a}{b} \rfloor$ right $\lceil \frac{c}{d} \rceil$ right rceil left $\lfloor \frac{a}{b} \rfloor$ right $\lceil \frac{c}{d} \rceil$ right rceil left
 Slashes and backslashes left / $\frac{a}{b}$ right backslash left / $\frac{a}{b}$ right backslash
 Up, down and up-down arrows left $\uparrow \frac{a}{b}$ right \downarrow quad left $\Uparrow \frac{a}{b}$ right \Downarrow quad left
 $\updownarrow \frac{a}{b}$ right $\Updownarrow \frac{a}{b}$ right $\updownarrow \frac{a}{b}$ right $\Updownarrow \frac{a}{b}$ right
 Delimiters can be mixed, as long as left and right match || left [0,1 right)
 left $\langle \psi \rangle$ right | || left [left . \$\frac{A}{B}\$ right } to X Size of the delimiters big\(Big\(bigg\(Bigg\(dots Bigg bigg\) Big\) big\) . big{ Big{ bigg{ Bigg{ dots Bigg](#)
 angle biggrangle biggrangle Bigrangle bigrangle . big| Big| bigg| Bigg| dots Bigg| bigg| Big| big| big| Big| bigg| Bigg| dots Bigg| bigg| Big| big| . biglfloor Biglfloor bigglfloor Bigglfloor dots Biggrceil biggrceil Bigrceil bigrceil biglfloor Biglfloor bigglfloor Bigglfloor dots Biggrceil biggrceil Bigrceil bigrceil . biguparrow Biguparrow bigguparrow Bigguparrow dots BiggDownarrow biggDownarrow BigDownarrow bigDownarrow biguparrow Biguparrow bigguparrow Bigguparrow dots BiggDownarrow biggDownarrow BigDownarrow bigDownarrow biguparrow Biguparrow bigguparrow Bigguparrow dots BiggDownarrow biggDownarrow BigDownarrow bigDownarrow biguparrow Biguparrow bigguparrow Bigguparrow dots BiggUpdownarrow biggUpdownarrow BigUpdownarrow bigUpdownarrow Bigupdownarrow bigupdownarrow Bigupdownarrow dots BiggUpdownarrow biggUpdownarrow BigUpdownarrow bigUpdownarrow bigupdownarrow Bigupdownarrow bigupdownarrow dots BiggUpdownarrow biggUpdownarrow BigUpdownarrow bigUpdownarrow bigupdownarrow Bigupdownarrow . big / Big / bigg / Bigg / dots Biggbackslash biggbackslash Bigbackslash bigbackslash big / Big / bigg / Bigg / dots Biggbackslash biggbackslash Bigbackslash bigbackslash

Alphabets and typefaces

Texvc cannot render arbitrary Unicode characters. Those it can handle can be entered by the expressions below. For others, such as Cyrillic, they can be entered as Unicode or HTML entities in running text, but cannot be used in displayed formulas.

_2. **Greek alphabet** Alpha Beta Gamma Delta Epsilon Zeta Alpha Beta Gamma Delta Epsilon Zeta ,! Eta Theta Iota Kappa Lambda Mu Eta Theta Iota Kappa Lambda Mu ,! Nu Xi Pi Rho Sigma Tau Nu Xi Pi Rho Sigma Tau,! Upsilon Phi Chi Psi Omega Upsilon Phi Chi Psi Omega ,!
 alpha beta gamma delta epsilon zeta alpha beta gamma delta epsilon zeta ,! eta theta iota kappa lambda mu eta theta iota kappa lambda mu ,! nu xi pi rho sigma tau nu xi pi rho sigma tau ,!
 varepsilon digamma vartheta varkappa varepsilon digamma vartheta varkappa ,! varpi varrho varsigma varphi varpi varrho varsigma varphi,!
 _2. **Blackboard Bold/Scripts** \mathbb{A} \mathbb{B} \mathbb{C} \mathbb{D} \mathbb{E} \mathbb{F} \mathbb{G} \mathbb{A} \mathbb{B} \mathbb{C} \mathbb{D} \mathbb{E} \mathbb{F} \mathbb{G} ,!
 \mathbb{H} \mathbb{I} \mathbb{J} \mathbb{K} \mathbb{L} \mathbb{M} \mathbb{H} \mathbb{I} \mathbb{J} \mathbb{K} \mathbb{L} \mathbb{M} ,!
 \mathbb{N} \mathbb{O} \mathbb{P} \mathbb{Q} \mathbb{R} \mathbb{S} \mathbb{T} \mathbb{N} \mathbb{O} \mathbb{P} \mathbb{Q} \mathbb{R} \mathbb{S} \mathbb{T} ,!
 \mathbb{U} \mathbb{V} \mathbb{W} \mathbb{X} \mathbb{Y} \mathbb{Z} \mathbb{U} \mathbb{V} \mathbb{W} \mathbb{X} \mathbb{Y} \mathbb{Z} ,!
 _2. **boldface (vectors)** \mathbf{A} \mathbf{B} \mathbf{C} \mathbf{D} \mathbf{E} \mathbf{F} \mathbf{G} \mathbf{A} \mathbf{B} \mathbf{C} \mathbf{D} \mathbf{E} \mathbf{F} \mathbf{G} ,!
 \mathbf{H} \mathbf{I}

\mathbf{J} \mathbf{K} \mathbf{L} \mathbf{M} \mathbf{H} \mathbf{I} \mathbf{J} \mathbf{K} \mathbf{L}
 \mathbf{M} ,! \mathbf{N} \mathbf{O} \mathbf{P} \mathbf{Q} \mathbf{R} \mathbf{S} \mathbf{T}
 \mathbf{N} \mathbf{O} \mathbf{P} \mathbf{Q} \mathbf{R} \mathbf{S} \mathbf{T} ,! \mathbf{U}
 \mathbf{V} \mathbf{W} \mathbf{X} \mathbf{Y} \mathbf{Z} \mathbf{U} \mathbf{V} \mathbf{W} \mathbf{X}
 \mathbf{Y} \mathbf{Z} ,! \mathbf{a} \mathbf{b} \mathbf{c} \mathbf{d} \mathbf{e} \mathbf{f} \mathbf{g}
 \mathbf{a} \mathbf{b} \mathbf{c} \mathbf{d} \mathbf{e} \mathbf{f} \mathbf{g} ,! \mathbf{h} \mathbf{i}
 \mathbf{j} \mathbf{k} \mathbf{l} \mathbf{m} \mathbf{h} \mathbf{i} \mathbf{j} \mathbf{k} \mathbf{l}
 \mathbf{m} ,! \mathbf{n} \mathbf{o} \mathbf{p} \mathbf{q} \mathbf{r} \mathbf{s} \mathbf{t} \mathbf{n}
 \mathbf{o} \mathbf{p} \mathbf{q} \mathbf{r} \mathbf{s} \mathbf{t} ,! \mathbf{u} \mathbf{v} \mathbf{w}
 \mathbf{x} \mathbf{y} \mathbf{z} \mathbf{u} \mathbf{v} \mathbf{w} \mathbf{x} \mathbf{y} \mathbf{z} ,!
 $\mathbf{0}$ $\mathbf{1}$ $\mathbf{2}$ $\mathbf{3}$ $\mathbf{4}$ $\mathbf{0}$ $\mathbf{1}$ $\mathbf{2}$ $\mathbf{3}$
 $\mathbf{4}$,! $\mathbf{5}$ $\mathbf{6}$ $\mathbf{7}$ $\mathbf{8}$ $\mathbf{9}$ $\mathbf{5}$ $\mathbf{6}$ $\mathbf{7}$
 $\mathbf{8}$ $\mathbf{9}$,! **2. Boldface (greek)** $\boldsymbol{\alpha}$ $\boldsymbol{\beta}$
 $\boldsymbol{\gamma}$ $\boldsymbol{\delta}$ $\boldsymbol{\epsilon}$ $\boldsymbol{\zeta}$
 $\boldsymbol{\alpha}$ $\boldsymbol{\beta}$ $\boldsymbol{\gamma}$ $\boldsymbol{\delta}$
 $\boldsymbol{\epsilon}$ $\boldsymbol{\zeta}$,! $\boldsymbol{\eta}$ $\boldsymbol{\theta}$ $\boldsymbol{\iota}$
 $\boldsymbol{\kappa}$ $\boldsymbol{\lambda}$ $\boldsymbol{\mu}$ $\boldsymbol{\eta}$ $\boldsymbol{\theta}$
 $\boldsymbol{\iota}$ $\boldsymbol{\kappa}$ $\boldsymbol{\lambda}$ $\boldsymbol{\mu}$,! $\boldsymbol{\nu}$
 $\boldsymbol{\xi}$ $\boldsymbol{\pi}$ $\boldsymbol{\rho}$ $\boldsymbol{\sigma}$ $\boldsymbol{\tau}$
 $\boldsymbol{\nu}$ $\boldsymbol{\xi}$ $\boldsymbol{\pi}$ $\boldsymbol{\rho}$ $\boldsymbol{\sigma}$
 $\boldsymbol{\tau}$,! $\boldsymbol{\upsilon}$ $\boldsymbol{\phi}$ $\boldsymbol{\chi}$ $\boldsymbol{\psi}$
 $\boldsymbol{\omega}$ $\boldsymbol{\upsilon}$ $\boldsymbol{\phi}$ $\boldsymbol{\chi}$ $\boldsymbol{\psi}$
 $\boldsymbol{\omega}$,! $\boldsymbol{\alpha}$ $\boldsymbol{\beta}$ $\boldsymbol{\gamma}$
 $\boldsymbol{\delta}$ $\boldsymbol{\epsilon}$ $\boldsymbol{\zeta}$ $\boldsymbol{\alpha}$ $\boldsymbol{\beta}$
 $\boldsymbol{\gamma}$ $\boldsymbol{\delta}$ $\boldsymbol{\epsilon}$ $\boldsymbol{\zeta}$,! $\boldsymbol{\eta}$
 $\boldsymbol{\theta}$ $\boldsymbol{\iota}$ $\boldsymbol{\kappa}$ $\boldsymbol{\lambda}$ $\boldsymbol{\mu}$
 $\boldsymbol{\eta}$ $\boldsymbol{\theta}$ $\boldsymbol{\iota}$ $\boldsymbol{\kappa}$ $\boldsymbol{\lambda}$
 $\boldsymbol{\mu}$,! $\boldsymbol{\nu}$ $\boldsymbol{\xi}$ $\boldsymbol{\pi}$ $\boldsymbol{\rho}$
 $\boldsymbol{\sigma}$ $\boldsymbol{\tau}$ $\boldsymbol{\nu}$ $\boldsymbol{\xi}$ $\boldsymbol{\pi}$
 $\boldsymbol{\rho}$ $\boldsymbol{\sigma}$ $\boldsymbol{\tau}$,! $\boldsymbol{\upsilon}$ $\boldsymbol{\phi}$
 $\boldsymbol{\chi}$ $\boldsymbol{\psi}$ $\boldsymbol{\omega}$ $\boldsymbol{\upsilon}$ $\boldsymbol{\phi}$
 $\boldsymbol{\chi}$ $\boldsymbol{\psi}$ $\boldsymbol{\omega}$,! $\boldsymbol{\varepsilon}$
 $\boldsymbol{\digamma}$ $\boldsymbol{\vartheta}$ $\boldsymbol{\varkappa}$ $\boldsymbol{\varepsilon}$
 $\boldsymbol{\digamma}$ $\boldsymbol{\vartheta}$ $\boldsymbol{\varkappa}$,! $\boldsymbol{\varpi}$
 $\boldsymbol{\varrho}$ $\boldsymbol{\varsigma}$ $\boldsymbol{\varphi}$ $\boldsymbol{\varpi}$
 $\boldsymbol{\varrho}$ $\boldsymbol{\varsigma}$ $\boldsymbol{\varphi}$,! **2. Italics** A B
 C D E F G A B C D
 E F G ,! H I J K L M
 H I J K L M ,! N O P
 Q R S T N O P Q R
 S T ,! U V W X Y Z U
 V W X Y Z ,! a b c d
 e f g a b c d e f g ,!
 h i j k l m h i j k
 l m ,! n o p q r s t n
 o p q r s t ,! u v w x

y z u v w x y z ,! $\mathit{0}$
 $\mathit{1}$ $\mathit{2}$ $\mathit{3}$ $\mathit{4}$ $\mathit{0}$ $\mathit{1}$ $\mathit{2}$ $\mathit{3}$ $\mathit{4}$,!
 $\mathit{5}$ $\mathit{6}$ $\mathit{7}$ $\mathit{8}$ $\mathit{9}$ $\mathit{5}$ $\mathit{6}$ $\mathit{7}$ $\mathit{8}$
 $\mathit{9}$,! **_2. Roman typeface** A B C D E
 F G A B C D E F
 G ,! H I J K L M H
 I J K L M ,! N O P
 Q R S T N O P Q
 R S T ,! U V W X Y
 Z U V W X Y Z ,! a
 b c d e f g a b
 c d e f g ,! h i j
 k l m h i j k l
 m ,! n o p q r s t
 n o p q r s t ,! u
 v w x y z u v w
 x y z ,! $\mathrm{0}$ $\mathrm{1}$ $\mathrm{2}$ $\mathrm{3}$ $\mathrm{4}$
 $\mathrm{0}$ $\mathrm{1}$ $\mathrm{2}$ $\mathrm{3}$ $\mathrm{4}$,! $\mathrm{5}$ $\mathrm{6}$ $\mathrm{7}$
 $\mathrm{8}$ $\mathrm{9}$ $\mathrm{5}$ $\mathrm{6}$ $\mathrm{7}$ $\mathrm{8}$ $\mathrm{9}$,! **_2. Fraktur typeface** \mathfrak{A} \mathfrak{B} \mathfrak{C} \mathfrak{D} \mathfrak{E} \mathfrak{F}
 \mathfrak{G} \mathfrak{A} \mathfrak{B} \mathfrak{C} \mathfrak{D} \mathfrak{E} \mathfrak{F}
 \mathfrak{G} ,! \mathfrak{H} \mathfrak{I} \mathfrak{J} \mathfrak{K} \mathfrak{L} \mathfrak{M}
 \mathfrak{H} \mathfrak{I} \mathfrak{J} \mathfrak{K} \mathfrak{L} \mathfrak{M} ,! \mathfrak{N}
 \mathfrak{O} \mathfrak{P} \mathfrak{Q} \mathfrak{R} \mathfrak{S} \mathfrak{T} \mathfrak{N}
 \mathfrak{O} \mathfrak{P} \mathfrak{Q} \mathfrak{R} \mathfrak{S} \mathfrak{T} ,! \mathfrak{U}
 \mathfrak{V} \mathfrak{W} \mathfrak{X} \mathfrak{Y} \mathfrak{Z} \mathfrak{U} \mathfrak{V}
 \mathfrak{W} \mathfrak{X} \mathfrak{Y} \mathfrak{Z} ,! \mathfrak{a} \mathfrak{b} \mathfrak{c}
 \mathfrak{d} \mathfrak{e} \mathfrak{f} \mathfrak{g} \mathfrak{a} \mathfrak{b} \mathfrak{c}
 \mathfrak{d} \mathfrak{e} \mathfrak{f} \mathfrak{g} ,! \mathfrak{h} \mathfrak{i} \mathfrak{j}
 \mathfrak{k} \mathfrak{l} \mathfrak{m} \mathfrak{h} \mathfrak{i} \mathfrak{j} \mathfrak{k} \mathfrak{l}
 \mathfrak{m} ,! \mathfrak{n} \mathfrak{o} \mathfrak{p} \mathfrak{q} \mathfrak{r} \mathfrak{s}
 \mathfrak{t} \mathfrak{n} \mathfrak{o} \mathfrak{p} \mathfrak{q} \mathfrak{r} \mathfrak{s} \mathfrak{t}
,! \mathfrak{u} \mathfrak{v} \mathfrak{w} \mathfrak{x} \mathfrak{y} \mathfrak{z} \mathfrak{u}
 \mathfrak{v} \mathfrak{w} \mathfrak{x} \mathfrak{y} \mathfrak{z} ,! $\mathfrak{0}$ $\mathfrak{1}$
 $\mathfrak{2}$ $\mathfrak{3}$ $\mathfrak{4}$ $\mathfrak{0}$ $\mathfrak{1}$ $\mathfrak{2}$ $\mathfrak{3}$
 $\mathfrak{4}$,! $\mathfrak{5}$ $\mathfrak{6}$ $\mathfrak{7}$ $\mathfrak{8}$ $\mathfrak{9}$ $\mathfrak{5}$
 $\mathfrak{6}$ $\mathfrak{7}$ $\mathfrak{8}$ $\mathfrak{9}$,! **_2. Calligraphy/Script** \mathcal{A}
 \mathcal{B} \mathcal{C} \mathcal{D} \mathcal{E} \mathcal{F} \mathcal{G} \mathcal{A} \mathcal{B}
 \mathcal{C} \mathcal{D} \mathcal{E} \mathcal{F} \mathcal{G} ,! \mathcal{H} \mathcal{I} \mathcal{J}
 \mathcal{K} \mathcal{L} \mathcal{M} \mathcal{H} \mathcal{I} \mathcal{J} \mathcal{K} \mathcal{L}
 \mathcal{M} ,! \mathcal{N} \mathcal{O} \mathcal{P} \mathcal{Q} \mathcal{R} \mathcal{S} \mathcal{T}
 \mathcal{N} \mathcal{O} \mathcal{P} \mathcal{Q} \mathcal{R} \mathcal{S} \mathcal{T} ,! \mathcal{U}
 \mathcal{V} \mathcal{W} \mathcal{X} \mathcal{Y} \mathcal{Z} \mathcal{U} \mathcal{V} \mathcal{W}
 \mathcal{X} \mathcal{Y} \mathcal{Z} ,! **_2. Hebrew** aleph beth gimel dalet aleph beth gimel
dalet,!

Formatting issues

Spacing

Note that [TeX](#) handles most spacing automatically, but you may sometimes want manual control.

Feature Syntax How it looks rendered double quad space $a \quad b$ a qquad b a qquad b quad space a quad b a quad b text space $a \ b \ a \ b$ text space without PNG conversion $a \ \mbox{ } \ b \ a \ \mbox{ } \ b$ large space $a;b \ a;b$ medium space $a>b$ (not supported) small space $a,b \ a,b$ no space $ab \ ab$, small negative space $a!b \ a!b$

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