

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 $\alpha^2+\beta^2=1$

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 mod, b a, b mod, b, !

Derivatives

nabla , partial x , dx , dot x , ddot y, dy/dx, frac{dy}{dx}, frac{partial^2 y}{partial x_1,partial x_2}
nabla , 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 subsequeq supset supseteq in ni not innotin subset subsequeq supset supseteq, ! cap
bigcap cup bigcup biguplus setminus smallsetminus cap bigcap cup bigcup biguplus setminus
smallsetminus, ! sqsubset sqsubsequeq sqsupset sqsupseteq sqcap sqcup bigsqcup sqsubset
sqsubsequeq sqsupset 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} sqrtblue{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 noto leftrightarrow nleftrightarrow longleftarrow longrightarrow longleftrightarrow leftarrow rightarrow nleftarrow noto leftrightarrow nleftrightarrow longleftarrow longrightarrow longleftrightarrow ,! Leftarrow Rightarrow nLeftarrow nRightarrow Leftrightarrow nLeftrightarrow Longleftarrow Longrightarrow Longleftrightarrow (or iff) Leftarrow Rightarrow nLeftarrow nRightarrow Leftrightarrow nLeftrightarrow Longleftarrow Longrightarrow Longleftrightarrow Longrightarrow Longleftrightarrow ,! uparrow downarrow updownarrow Uparrow Downarrow Updownarrow narrow searrow swarrow narrow uparrow downarrow updownarrow Uparrow Downarrow Updownarrow narrow searrow swarrow narrow rightharpoonup rightharpoondown leftharpoonup leftharpoondown upharpoonleft upharpoonright downharpoonleft downharpoonright rightleftharpoons leftrightharpoons rightharpoonup rightharpoondown leftharpoonup leftharpoondown upharpoonleft upharpoonright downharpoonleft downharpoonright rightleftharpoons leftrightharpoons ,! curvearrowleft circlearrowleft Lsh upuparrows rightrightarrows rightleftarrows Rightarrow rightarrowtail looparrowright curvearrowleft circlearrowleft Lsh upuparrows rightrightarrows rightleftarrows Rightarrow 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 Idots cdots And eth S P % dagger ddagger Idots cdots,! smile frown wr triangleleft triangleright infty bot top smile frown wr triangleleft triangleright infty 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 lefthreetimes rightthreetimes curlywedge curlyvee circledash circledast circledcirc centerdot intercal leqq leqlant rightthreetimes curlywedge curlyvee circledash circledast circledcirc centerdot intercal leqq leqlant eqqlantless lessapprox approxeq lessdot III lessgrtr lesseqgtr lesseqqgtr doteqdot risingdotseq eqqlantless lessapprox approxeq lessdot III lessgrtr lesseqgtr lesseqqgtr doteqdot risingdotseq fallingdotseq backsimeq subseteqq Subset preccurlyeq curlyeqprec precsim precapprox vartriangleleft fallingdotseq backsimeq subseteqq Subset preccurlyeq curlyeqprec precsim precapprox vartriangleleft Vvdash bumpeq Bumpeq geqq geqlant eqqlantgtr gtrsim gtrapprox eqsim gtrdot Vvdash bumpeq Bumpeq geqq geqlant eqqlantgtr gtrsim gtrapprox eqsim gtrdot ggg gtrless gtreqless gtreqless eqcirc circeq triangleq thicksim thickapprox supseteqq ggg gtrless gtreqless gtreqless eqcirc circeq triangleq thicksim thickapprox supseteqq Supset succcurlyeq curlyeqsucc succsim succapprox vartriangleright shortmid shortparallel between pitchfork Supset succcurlyeq curlyeqsucc succsim succapprox vartriangleright shortmid shortparallel between pitchfork varproto blacktriangleleft therefore backepsilon blacktriangleright because neqlant neqq Ineq Ineq varproto blacktriangleleft therefore backepsilon blacktriangleright because neqlant neqq Ineq Ineq Ivertneqq Insim Inapprox nprec npreceq precneqq precnsim precnapprox nsim nshortmid Ivertneqq Insim Inapprox nprec npreceq precneqq precnsim precnapprox nsim nshortmid nvDash nvDash ntriangleleft ntrianglelefteq nsubseteq nsubseteq varssubsetneq subsetneqq varssubsetneq ngtr nvDash nvDash ntriangleleft ntrianglelefteq nsubseteq nsubseteq varssubsetneq subsetneqq varssubsetneqq ngtr subsetneq subsetneq neqlant neqq gneq gneqq gvertneqq gnsim gnapprox nsucc nsucceq succneqq neqlant neqq 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 nsupseteqq varssubsetneq supsetneqq varssubsetneqq nsupseteqq varssubsetneq supsetneqq varssubsetneqq jmath surd ast uplus diamond bigtriangleup bigtriangledown ominus jmath surd ast uplus diamond bigtriangleup bigtriangledown ominus,! oslash odot bigcirc amalg prec succ preceq succceq oslash odot bigcirc amalg prec succ preceq succceq,! 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] quad left lbrack $\frac{a}{b}$ right rbrack left [right](#) quad left lbrack $\frac{a}{b}$ right rbrack Braces left { $\frac{a}{b}$ right } quad left lbrace $\frac{a}{b}$ right rbrace left { $\frac{a}{b}$ right } quad left lbrace $\frac{a}{b}$ right rbrace Angle brackets left langle $\frac{a}{b}$ right rangle left langle $\frac{a}{b}$ right rangle Bars and double bars left | $\frac{a}{b}$ right vert left Vert

frac{c}{d} right | left | frac{a}{b} right vert left Vert frac{c}{d} right | Floor and ceiling functions: left Ifloor frac{a}{b} right rfloor left lceil frac{c}{d} right rceil left Ifloor frac{a}{b} right rfloor left lceil frac{c}{d} right rceil 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 left uparrow frac{a}{b} right downarrow quad left Uparrow frac{a}{b} right Downarrow quad left updownarrow frac{a}{b} right Updownarrow Delimiters can be mixed, as long as left and right match || left [0,1 right)

left langle psi right | || left [left . frac\(A\){B} right } to X Size of the delimiters big\(Big\(bigg\(Bigg\(dots Bigg\) bigg\) Big\) big\] big\] . big{ Big{ bigg{ Bigg{ dots Biggrangle biggrangle Bigrangle bigrangle big{ Big{ bigg{ Bigg{ dots Biggrangle biggrangle Bigrangle bigrangle . big| Big| bigg| Bigg| dots Bigg| bigg| Big| big| big| Big| bigg| Bigg| dots Bigg| bigg| Big| big| big| Big| bigg| Bigg| dots Bigglfloor dots Biggrceil biggrceil Bigrceil bigrceil biglfloor Biglfloor bigglfloor Bigglfloor dots Biggrceil biggrceil Bigrceil bigrceil . biguparrow Biguparrow biguparrow Bigguparrow dots BiggDownarrow biggDownarrow BigDownarrow biguparrow Biguparrow bigguparrow Bigguparrow dots Bigguparrow Bigguparrow dots \[BiggDownarrow\]\(#\) biggDownarrow \[BigDownarrow\]\(#\) bigDownarrow . bigupdownarrow Bigupdownarrow bigupdownarrow Biggupdownarrow dots BiggUpdownarrow biggUpdownarrow BigUpdownarrow bigUpdownarrow bigupdownarrow Bigupdownarrow biggupdownarrow Biggupdownarrow dots \[BiggUpdownarrow\]\(#\) biggUpdownarrow \[BigUpdownarrow\]\(#\) 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 ,! upsilon phi chi psi omega upsilon phi chi psi omega ,! 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},! boldsymbol{\varphi} \\ mathit{A} mathit{B} \\ mathit{C} mathit{D} mathit{E} mathit{F} mathit{G} mathit{A} mathit{B} mathit{C} mathit{D} \\ mathit{E} mathit{F} mathit{G},! mathit{H} mathit{I} mathit{J} mathit{K} mathit{L} mathit{M} \\ mathit{H} mathit{I} mathit{J} mathit{K} mathit{L} mathit{M},! mathit{N} mathit{O} mathit{P} \\ mathit{Q} mathit{R} mathit{S} mathit{T} mathit{N} mathit{O} mathit{P} mathit{Q} mathit{R} \\ mathit{S} mathit{T},! mathit{U} mathit{V} mathit{W} mathit{X} mathit{Y} mathit{Z} mathit{U} \\ mathit{V} mathit{W} mathit{X} mathit{Y} mathit{Z},! mathit{a} mathit{b} mathit{c} mathit{d} \\ mathit{e} mathit{f} mathit{g} mathit{a} mathit{b} mathit{c} mathit{d} mathit{e} mathit{f} mathit{g},! \\ mathit{h} mathit{i} mathit{j} mathit{k} mathit{l} mathit{m} mathit{h} mathit{i} mathit{j} mathit{k} \\ mathit{l} mathit{m},! mathit{n} mathit{o} mathit{p} mathit{q} mathit{r} mathit{s} mathit{t} mathit{n} \\ mathit{o} mathit{p} mathit{q} mathit{r} mathit{s} mathit{t},! mathit{u} mathit{v} mathit{w} mathit{x}

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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 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	,
small negative space	a!b	a!b									

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