

List of LaTeX symbols

LaTeX symbols have either names (denoted by backslash) or special characters. They are organized into seven *classes* based on their role in a mathematical expression. This is not a comprehensive list. Refer to the external references at the end of this article for more information.

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Class 0 (Ord) symbols: Simple / ordinary ("noun") [Edit](#)

Latin letters and Arabic numerals [Edit](#)

Letters are rendered in italic font; numbers are upright / roman. `\imath` and `\jmath` make "dotless" i and j, which are useful in conjunction with **hats** and **accents**.

LaTeX markup...	...results in:
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	<i>A B C D E F G H I J K L M N O P Q R S T U V W X Y Z</i>
a b c d e f g h i j k l m n o p q r s t u v w x y z	<i>a b c d e f g h i j k l m n o p q r s t u v w x y z</i>
0 1 2 3 4 5 6 7 8 9	0123456789
\imath \quad \jmath \quad \quad \quad \hat{\jmath}	<i>i j ĵ</i>

Greek letters [Edit](#)

Lower case Greek letters are rendered in italic font; upper case Greek letters are rendered in upright/Roman.

Upper case Greek letters	Lower case Greek letters	Misc Greek letters
Γ <code>\Gamma</code>	α <code>\alpha</code>	Ϝ <code>\digamma</code>
Δ <code>\Delta</code>	β <code>\beta</code>	Ε <code>\varepsilon</code>
Λ <code>\Lambda</code>	γ <code>\gamma</code>	ϰ <code>\varkappa</code>
Φ <code>\Phi</code>	δ <code>\delta</code>	φ <code>\varphi</code>
Π <code>\Pi</code>	ε <code>\epsilon</code>	ϗ <code>\varpi</code>
Ψ <code>\Psi</code>	ζ <code>\zeta</code>	ρ <code>\varrho</code>
Σ <code>\Sigma</code>	η <code>\eta</code>	ς <code>\varsigma</code>
Θ <code>\Theta</code>	θ <code>\theta</code>	ϑ <code>\vartheta</code>

Other alphabetic characters [Edit](#)

ℵ <code>\aleph</code>	ℭ <code>\complement</code>	ℏ <code>\hslash</code>	Ⓢ <code>\circledS</code>	Ⓖ <code>\Game</code>
beth <code>\beth</code>	ℓ <code>\ell</code>	ℳ <code>\mho</code>	℔ <code>\Bbbk</code>	ℑ <code>\Im</code>
daleth <code>\daleth</code>	eth <code>\eth</code>	∂ <code>\partial</code>	‡ <code>\Finv</code>	℞ <code>\Re</code>
gimel <code>\gimel</code>	hbar <code>\hbar</code>	wp <code>\wp</code>		

Other simple symbols [Edit](#)

The following characters don't have any spacing associated with them. That is, they are simple symbols, in class 0.

# <code>\#</code>	♣ <code>\clubsuit</code>	∞ <code>\infty</code>	‡ <code>\sharp</code>
∠ <code>\angle</code>	↘ <code>\diagdown</code>	◇ <code>\lozenge</code>	♠ <code>\spadesuit</code>
′ <code>\backprime</code>	↗ <code>\diagup</code>	∠ <code>\measuredangle</code>	∠ <code>\sphericalangle</code>
★ <code>\bigstar</code>	◇ <code>\diamondsuit</code>	∇ <code>\nabla</code>	□ <code>\square</code>
♠ <code>\blacklozenge</code>	∅ <code>\emptyset</code>	ℵ <code>\natural</code>	√ <code>\surd</code>
■ <code>\blacksquare</code>	∃ <code>\exists</code>	¬ <code>\neg</code> or <code>\not</code>	⤴ <code>\top</code>
▲ <code>\blacktriangle</code>	♭ <code>\flat</code>	∄ <code>\nexists</code>	△ <code>\triangle</code>
▼ <code>\blacktriangledown</code>	∀ <code>\forall</code>	′ <code>\prime</code>	▽ <code>\triangledown</code>
⊥ <code>\bot</code>	♥ <code>\heartsuit</code>	§ <code>\S</code>	∅ <code>\varnothing</code>

There is also a command `\&` which is not supported by Wikia's LaTeX parser.

Hats, bars, and accents [Edit](#)

Symbols that go above, below, or in the corners of other symbols.

Note 1: dotless *i* and *j* (symbols `\imath` and `\jmath`) can be used to leave room for whatever hat you want them to wear.

Note 2: `\sideset` takes two required parameters, left side and right side, and must be followed by a **sum class** math operator that normally takes subscripts and superscripts below and above the symbol.

acute <code>\acute{x}</code>	\overleftarrow{xxx} <code>\overleftarrow{xxx}</code>
grave <code>\grave{x}</code>	\overrightarrow{xxx} <code>\overrightarrow{xxx}</code>
ddot <code>\ddot{x}</code>	\overleftrightarrow{xxx} <code>\overleftrightarrow{xxx}</code>
tilde <code>\tilde{x}</code>	$\xleftarrow[under]{over}$ <code>\xleftarrow[under]{over}</code>
bar <code>\bar{x}</code>	$\xrightarrow[under]{over}$ <code>\xrightarrow[under]{over}</code>
breve <code>\breve{x}</code>	
check <code>\check{x}</code>	

$$\underbrace{xxx}_{\text{}} \quad \backslash \text{underbrace}\{xxx\}$$

`\ddot{\cdot}` `\widetilde{\cdot}` `\underleftarrow{\cdot}` `\underrightarrow{\cdot}` `\underleftrightarrow{\cdot}`

[Edit](#)

Bold face: `\boldsymbol` and `\mathbf` make bold face symbols, and `\pmb` makes very bold face symbols. However, `\mathbf` cannot be applied to Greek symbols, for instance. The AMS "short guide" (see references) contains a cryptic comment, "generally speaking, it is ill-advised to apply `\boldsymbol` to more than one symbol at a time." Best not to discover why!

LaTeX markup...	...results in:
$A_\infty + \pi A_0$	$A_\infty + \pi A_0$
$\mathbf{A}_\infty + \pi \mathbf{A}_0$	$\mathbf{A}_\infty + \pi \mathbf{A}_0$
$\mathbf{A}_\infty + \pi \mathbf{A}_0$	$\mathbf{A}_\infty + \pi \mathbf{A}_0$
$2\alpha x^2yz+5$	$2\alpha x^2yz+5$
$2\alpha x^2yz+5$	$2\alpha x^2yz+5$

The **\pmb** command is not supported by the Wikia's LaTeX parser.

Other fonts are...

LaTeX markup...	...results in:	...is used for:
$\mathbb{A B C . . . M}$	A B C D E F G H I J K L M	Blackboard bold (no lowercase) is used to represent standard sets of numbers, e.g. \mathbb{C} complex numbers, \mathbb{H} quaternions, \mathbb{N} natural numbers, \mathbb{O} octonians, \mathbb{Q} rationals, \mathbb{R} reals, \mathbb{S} sedenions, \mathbb{Z} integers.
$\mathbb{N X Y Z}$	N O P Q R S T U V W X Y Z	Blackboard bold (no lowercase) is used to represent standard sets of numbers, e.g. \mathbb{C} complex numbers, \mathbb{H} quaternions, \mathbb{N} natural numbers, \mathbb{O} octonians, \mathbb{Q} rationals, \mathbb{R} reals, \mathbb{S} sedenions, \mathbb{Z} integers.
$\mathcal{A B C . . . M}$	A B C D E F G H I J K L M	Calligraphic letters (no lowercase)
$\mathcal{N X Y Z}$	N O P Q R S T U V W X Y Z	Calligraphic letters (no lowercase)
$\mathfrak{A B C . . . M}$	A B C D E F G H I J K L M	Fraktur letters
$\mathfrak{N X Y Z}$	N O P Q R S T U V W X Y Z	Fraktur letters
$\mathfrak{a b c . . . m}$	a b c d e f g h i j k l m	Fraktur letters
$\mathfrak{n x y z}$	n o p q r s t u v w x y z	Fraktur letters
$\mathrm{A B C . . . M}$	A B C D E F G H I J K L M	Roman letters
$\mathrm{N X Y Z}$	N O P Q R S T U V W X Y Z	Roman letters
$\mathrm{a b c . . . m}$	a b c d e f g h i j k l m	Roman letters
$\mathrm{n x y z}$	n o p q r s t u v w x y z	Roman letters

Edit

Main article: [Spaces](#)

Edit

Simple symbols (class 0) are rendered without any space between them. Operators (class 1) are rendered with spaces. Spacing symbols change the amount of spacing, either by adding more space or taking spaces away. Space is measured in *math units*, or mu. 18mu equals 1em.

LaTeX markup...	...results in:	...is used for:
<code>a b c d</code>	<i>abcd</i>	Simple symbols (class 0) have no spaces around them
<code>\sin b \cos d</code>	<i>\sin b \cos d</i>	Operators (class 1) have thin spaces around them
<code>a \, b \mspace{3mu} c \thinspace d</code>	<i>a b c d</i>	thin 3mu space
<code>a \: b \mspace{4mu} c \medspace d</code>	<i>a b c\medspaced</i>	medium 4mu space
<code>a \; b \mspace{5mu} c \thickspace d</code>	<i>a b c\thickspaced</i>	thick 5mu space
<code>a \ b \mspace{6mu} c \ d</code>	<i>a b c d</i>	thicker 6mu space provided by backslash followed by blank
<code>a \quad b \mspace{18mu} c \quad d</code>	<i>a \ b \ c \ d</i>	18mu or 1em space
<code>a \qquad b \mspace{36mu} c \qquad d</code>	<i>a \ \ b \ \ c \ \ d</i>	36mu or 2em space
<code>a \! b \mspace{-3mu} c \negthinspace d</code>	<i>dcd</i>	negative thin -3mu space. See <code>\int</code> for a suggested use.
<code>a \negmedspace b \mspace{-4mu} c \negmedspace d</code>	<i>dcd</i>	negative medium -4mu space
<code>a \negthickspace b \mspace{-5mu} c \negthickspace d</code>	<i>dcd</i>	negative thick -5mu space

Spaces of exactly the size of some rendered text can be obtained using the `\phantom`, command, and its cousins, `\hphantom` and `\vphantom`, as follows:

LaTeX markup...	...results in:	...is used for:
<code>& a \ b \\\& \cdot \cdot \\\& c \ d</code>	<i>a b</i> <i>.</i> <i>c d</i>	space as wide and high as integral and three X's
<code>& a \ b \\\& \cdot \hphantom{\int XXX} \cdot \\\& c \ d</code>	<i>a b</i> <i>.</i> <i>c d</i>	space as wide as integral and three X's; height 0
<code>& a \ b \\\& \cdot \vphantom{\int XXX} \cdot \\\& c \ d</code>	<i>a b</i> <i>..</i> <i>c d</i>	space of width 0, as high as integral and three X's

ADVERTISEMENT

Class 1 (Op) symbols: prefix operator (extensible) [Edit](#)

Accumulation operators: sum, integral, union, etc. [Edit](#)

Main article: *Sum-class symbol*

These prefix operators accumulate the things they're prefixed to. "Extensible" means they have variable size to accommodate their operands, and their limits can appear below and above the operator.

`\int``\oint``\bigcap``\bigcup`

`\bigodot``\bigoplus``\bigotimes``\bigsqcup`

`\biguplus``\bigvee``\bigwedge``\bigtimes`

`\prod``\coprod``\sum``\liminf`

The `\smallint` command is not supported by the Wikia's LaTeX parser.

Named operators: sin, cos, etc. [Edit](#)

If your favorite operator, say, "foo", isn't listed, then you won't be able to use `\foo(x)` in your LaTeX equation. But don't fret. You can get the same result with `\operatorname{foo}(x)`. If your made-up operator needs displayed limits, as in `\lim` or `\max`, then use `\operatorname*{foo}`, as in the example in the following table.

`arccos``\arccos``det``\det``lim inf``\liminf``sinh``\sinh`

`arcsin``\arcsin``dim``\dim``lim sup``\limsup``sup``\sup`

`arctan``\arctan``exp``\exp``ln``\ln``tan``\tan`

`arg``\arg``gcd``\gcd``log``\log``tanh``\tanh`

`cos``\cos``hom``\hom``max``\max``lim``\varinjlim`

`cosh``\cosh``inf``\inf``min``\min``lim``\varprojlim`

`cot``\cot``inj lim``\injlim``Pr``\Pr``lim``\varliminf`

`coth``\coth``ker``\ker``proj lim``\projlim``lim``\varlimsup`

`csc``\csc``lg``\lg``sec``\sec``foo``\operatorname{foo}_0^1`

`deg``\deg``lim``\lim``sin``\sin`

The command `\operatorname*` is not supported by the wikia's LaTeX parser.

Class 2 (Bin) symbols: binary operator ("conjunction") [Edit](#)

The binary operator symbols are...

\ast	\Cap or \doublecap	\divideontimes	\rightthreetimes
$+$	\cdot	\dotplus	\rtimes
$-$	\centerdot	\doublebarwedge	\setminus
\amalg	\circ	\gtrdot	\smallsetminus
\ast	\circledast	\intercal	\sqcap
\barwedge	\circledcirc	\leftthreetimes	\sqcup
\bigcirc	\ominus	\lessdot	\star
\bigtriangledown	\cup	\ltimes	\times
\bigtriangleup	\Cup or \doublecup	\mp	\triangleleft
\boxdot	\curlyvee	\odot	\triangleright
\boxminus	\curlywedge	\ominus	\uplus
\boxplus	\dagger	\oplus	\vee or \lor
\boxtimes	\ddagger	\oslash	\veebar
\bullet	\diamond	\otimes	\wedge or \land
\cap	\div	\pm	\wr

Class 3 (Rel) symbols: relation / comparison ("verb") [Edit](#)

<, =, >, and variants [Edit](#)

$<$	\geq	\lll or \llless	\preccurlyeq
$=$	\geqslant	\lnapprox	\preceq
$>$	\gg	\lneq	\precnapprox
\approx	\ggg or \gggtr	\lneqq	\precneqq
\approxeq	\gapprox	\lnsim	\precnsim
\asymp	\gneq	\lvertneqq	\precsim
\backsim	\gneqq	\ncong	\risingdotseq
\backsimeq	\gnsim	\neq or \ne	\sim
\bumpeq	\gtrapprox	\ngeq	\simeq
\Bumpeq	\gtreqless	\ngeqq	\succ
\circeq	\gtreqgless	\ngeqslant	\succapprox
\cong	\gtrless	\ngtr	\succcurlyeq
\curlyeqprec	\gtrsim	\nleq	\succeq
\curlyeqsucc	\gvertneqq	\nleqq	\succnapprox
\doteq	\leq or \le	\nleqslant	\succneqq
\doteqdot or \Doteq	\leqq	\nless	\succnsim
\eqcirc	\leqslant	\nprec	\succsim
\eqsim	\lessapprox	\npreceq	\thickapprox
\eqslantgtr	\lesseqgtr	\nsim	\thicksim
\eqslantless	\lesseqqgtr	\nsucc	\triangleq
\equiv	\lessgtr	\nsucceq	
\fallingdotseq	\lesssim	\prec	
\geq or \ge	\ll	\precapprox	

Arrows [Edit](#)

\circlearrowleft	\longleftarrow	\rightarrow or \to
\circlearrowright	\Lleftarrow	\Rightarrow
\curvearrowleft	\longleftrightarrow	\rightarrowtail
\curvearrowright	\Longleftrightarrow	\rightharpoonupdown
\downdownarrows	\mapsto	\rightharpoonup
\downharpoonleft	\longrightarrow	\rightharpoonlefts
\downharpoonright	\Longrightarrow or \implies	\rightharpoonrights
\hookleftarrow		\rightsquigarrow
\hookrightarrow	\looparrowleft	
\leftarrow or \gets	\looparrowright	\Rrightarrow
\Leftarrow	\Lsh	\Rsh
\leftarrowtail	\mapsto	\searrow
\leftharpoonupdown	\multimap	\swarrow
\leftharpoonup	\nLeftarrow	\twoheadleftarrow
\leftleftarrows	\nLeftrightarrow	\twoheadrightarrow
\leftrightarrow	\nRightarrow	\upharpoonleft

\Leftrightarrow	<code>\Leftrightarrow</code>	\nearrow	<code>\nearrow</code>	\Uparrow	<code>\upharpoonright</code> or <code>\restriction</code>
\leftrightsquigarrow	<code>\leftrightsquigarrow</code>	\nwarrow	<code>\nwarrow</code>		
\Lleftarrow	<code>\Lleftarrow</code>				

Other relation symbols [Edit](#)

\backsimeq	<code>\backsimeq</code>	\nsubseteq	<code>\nsubseteq</code>	\smile	<code>\smile</code>	\therefore	<code>\therefore</code>
\because	<code>\because</code>	\supseteq	<code>\supseteq</code>	\trianglelefteq	<code>\trianglelefteq</code>		
\between	<code>\between</code>	\sqsubset	<code>\sqsubset</code>	\trianglerighteq	<code>\trianglerighteq</code>		
\blacktriangleleft	<code>\blacktriangleleft</code>	\sqsupseteq	<code>\sqsupseteq</code>	\varpropto	<code>\varpropto</code>		
\blacktriangleright	<code>\blacktriangleright</code>	\ntrianglerighteq	<code>\ntrianglerighteq</code>	\varsubsetneq	<code>\varsubsetneq</code>		
\bowtie	<code>\bowtie</code>	\ntrianglerighteq	<code>\ntrianglerighteq</code>	\varsubsetneqq	<code>\varsubsetneqq</code>		
\dashv	<code>\dashv</code>	\ntrianglerighteq	<code>\ntrianglerighteq</code>	\varsubsetneqq	<code>\varsubsetneqq</code>		
\frown	<code>\frown</code>	\nvdash	<code>\nvdash</code>	\varsubsetneqq	<code>\varsubsetneqq</code>		
\in	<code>\in</code>	\nVdash	<code>\nVdash</code>	\vartriangle	<code>\vartriangle</code>		
\mid	<code>\mid</code>	\nVDash	<code>\nVDash</code>	\vartriangleleft	<code>\vartriangleleft</code>		
\models	<code>\models</code>	\nVDash	<code>\nVDash</code>	\vartriangleright	<code>\vartriangleright</code>		
\ni	<code>\ni</code> or <code>\owns</code>	\parallel	<code>\parallel</code>	\vdash	<code>\vdash</code>		
\nmid	<code>\nmid</code>	\perp	<code>\perp</code>	\Vdash	<code>\Vdash</code>		
\notin	<code>\notin</code>	\pitchfork	<code>\pitchfork</code>	\Vdash	<code>\Vdash</code>		
\nparallel	<code>\nparallel</code>	\propto	<code>\propto</code>	\Vdash	<code>\Vdash</code>		
\nshortmid	<code>\nshortmid</code>	\shortmid	<code>\shortmid</code>				
\nshortparallel	<code>\nshortparallel</code>	\shortparallel	<code>\shortparallel</code>				
\nsubseteq	<code>\nsubseteq</code>	\smallfrown	<code>\smallfrown</code>				

Class 4 (open; left) and class 5 (close; right) symbols (extensible) [Edit](#)

Paired left and right symbols [Edit](#)

$()$	<code>()</code>	$\langle \rangle$	<code>\langle \rangle</code>
$[]$	<code>[]</code>	$\lceil \rceil$	<code>\lceil \rceil</code>
$\{ \}$	<code>\{ \}</code>	$\lfloor \rfloor$	<code>\lfloor \rfloor</code>
$\ $	<code>\ </code>		

The following commands are not supported by the Wikia's LaTeX parser:

`\lvert \rvert \lgroup \rgroup \lmoustache \rmoustache`

Nonpairing symbols (extensible) [Edit](#)

$\ $	<code>\ </code> or <code>\ </code>
$\ $	<code>\ </code> or <code>\ </code>
$/$	<code>/</code>
\backslash	<code>\backslash</code>

The following commands are not supported by the Wikia's LaTeX parser:

`\arrowvert \Arrowvert \lbracevert`

Vertical arrows (extensible) [Edit](#)

\uparrow	<code>\uparrow</code>	\downarrow	<code>\downarrow</code>	\updownarrow	<code>\updownarrow</code>
\Uparrow	<code>\Uparrow</code>	\Downarrow	<code>\Downarrow</code>	\Updownarrow	<code>\Updownarrow</code>

Class 6 (Pun) symbols: postfix / punctuation [Edit](#)

The punctuation symbols are

\cdot	<code>\cdot</code>	$;$	<code>;</code>	$?$	<code>?</code>
$/$	<code>/</code>	$:$	<code>\colon</code>	\cdots	<code>\dotsb</code>
$ $	<code> </code>	$:$	<code>:</code>	\ddots	<code>\ddots</code>
$,$	<code>,</code>	$!$	<code>!</code>	\vdots	<code>\vdots</code>

The following commands are not supported by the Wikia's LaTeX parser:

`\dotsc \dotsi \dotsm \dotso`

- [Short Math Guide for LaTeX](#), by Michael Downes, AMS
- [User's Guide for the amsmath Package](#)
- [The Comprehensive LaTeX Symbols List](#) (Pakin)
- [LaTeX reference card](#)
- [CTAN](#), the Comprehensive TeX Archive Network
- [LaTeX help file for the VIM editor](#)
- [Sourceforge Mini LaTeX Tutorial](#)
- [LaTeX help at wikipedia](#)
- [LaTeX Cookbook](#)

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