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Cheat Sheet: Adding Math Notation to Markdown

Apr 2, 2024 · 7 min read · **Documentation**   **Linux**   **Mac**   **Windows**   **Markdown**   **LaTeX**   **Markdown**   **VSCode**

A quick-reference guide, with examples, on how to add math notation to Markdown documents.

The scope of mathematical notation included in this cheat sheet is drawn from the Math Notation Cheat Sheet ↗ poster, created by Dominic Walliman ↗ , included here with permission. The associated YouTube video, which is excellent, is The Map of Mathematics ↗ .

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There are two ways to include math notation in Markdown. First, `inline`, which means that the notation is included in the paragraph or sentence, with the flow of text.

The second is as separate `code blocks`, so that the notation is shown in it's own paragraph.

Inline math notation is wrapped in single-dollar signs. For example, for `the square of "x"`, just type `$x^2$`, which is then formatted as x^2. This is $\LaTeX$ notation.

Alternatively, `code blocks` of $\LaTeX$ begin and end with two dollar signs, wrapped inside triple backticks. For example...

LATEX

```
$$
\displaystyle\sum_{k=3}^5 k^2=3^2 + 4^2 + 5^2 =50
$$
```
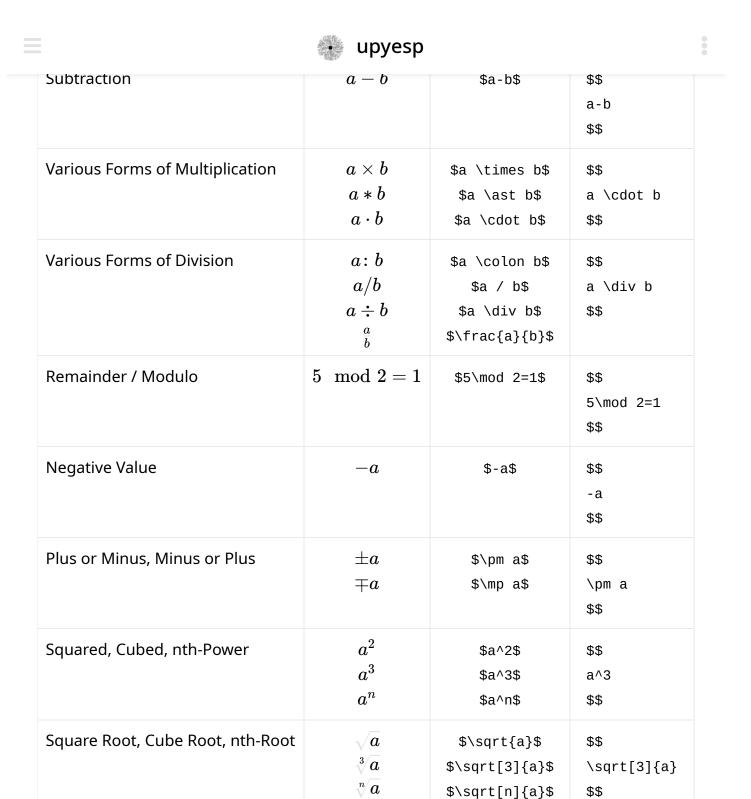
The above is rendered as:

$$\sum_{k=3}^{5} k^2 = 3^2 + 4^2 + 5^2 = 50$$

2. LaTeX Cheat Sheet 🔗

> Tip: These tables are wide, so you may need to scroll horizontally to see all the columns, or rotate your phone to landscape.

2.1. Arithmetic 🔗

Notation	Example	Inline	Code Block
Addition	$a + b$	$a+b$	$$ a+b $$

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Subtraction	$a - b$	`$a-b$`	`$$`
			`a-b`
			`$$`

Various Forms of Multiplication	$a \times b$
	$a * b$
	$a \cdot b$
		`$a \times b$`
		`$a \ast b$`
		`$a \cdot b$`
			`$$`
			`a \cdot b`
			`$$`

Various Forms of Division	$a : b$
	a/b
	$a \div b$
	$\frac{a}{b}$
		`$a \colon b$`
		`$a / b$`
		`$a \div b$`
		`$\frac{a}{b}$`
			`$$`
			`a \div b`
			`$$`

Remainder / Modulo	$5 \mod 2 = 1$	`$5\mod 2=1$`	`$$`
			`5\mod 2=1`
			`$$`

Negative Value	$-a$	`$-a$`	`$$`
			`-a`
			`$$`

Plus or Minus, Minus or Plus	$\pm a$
	$\mp a$
		`$\pm a$`
		`$\mp a$`
			`$$`
			`\pm a`
			`$$`

Squared, Cubed, nth-Power	a^2
	a^3
	a^n
		`$a^2$`
		`$a^3$`
		`$a^n$`
			`$$`
			`a^3`
			`$$`

Square Root, Cube Root, nth-Root	$\sqrt{a}$
	$\sqrt[3]{a}$
	$\sqrt[n]{a}$
		`$\sqrt{a}$`
		`$\sqrt[3]{a}$`
		`$\sqrt[n]{a}$`
			`$$`
			`\sqrt[3]{a}`
			`$$`

2.2. Equality 🔗

Notation	Example	Inline	Code Block

Equals	$3 = 1 + 2$	`$3=1+2$`	`$$`
			`3=1+2`
			`$$`

Not Equals	$3 \neq 4$	`$3\neq4$`	`$$`
			`3\neq4`
			`$$`

Identical / Equivalent To	$a \equiv b$	`$a \equiv b$`	`$$`
			`a \equiv b`
			`$$`

Proportional To	$a \propto b$	`$a \propto b$`	`$$`
			`a \propto b`
			`$$`

Approximately Equal To	$\sin(0.01) \approx 0.01$	`$\sin(0.01) \approx 0.01$`	`$$`
			`\sin(0.01)`
			`\approx 0.01`
			`$$`

2.3. Comparison 🔗

Notation	Example	Inline	Code Block

a Less Than b
a Greater Than b
	$a < b$
	$a > b$
		`$a<b$`
		`$a>b$`
			`$$`
			`a<b`
			`$$`

a Less Than or Equal To b
a Greater Than or Equal To b
	$a \leq b$
	$a \geq b$
		`$a \leq b$`
		`$a \geq b$`
			`$$`
			`a \leq b`
			`$$`

a Much Smaller Than b
a Much Larger Than b
	$a \ll b$
	$a \gg b$
		`$a \ll b$`
		`$a \gg b$`
			`$$`
			`a \ll b`
			`$$`

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Notation	Example	Inline	Code Block
Factorial	$5! = 5 \times 4 \times 3 \times 2 \times 1$	`$5!=5 \times 3 \times 2 \times 1$`	```$$ 5!=5 \times 4 \times 3 \times 2 \times 1 $$```
Absolute Value	$\|-5\| = 5$	`$\|-5\|=5$`	```$$ \|-5\|=5 $$```
Function Of	$f(x) = 2x^2$	`$f(x)=2x^2$`	```$$ f(x)=2x^2 $$```
Change or Difference	$\Delta x = x_1 - x_0$	`$\Delta x = x_1 - x_0$`	```$$ \Delta x = x_1 - x_0 $$```
Pi	$\pi = 3.14159\ldots$	`$\pi = 3.14159...$`	```$$ \pi $$```
Euler's Constant	$e = 2.71828\ldots$	`$e = 2.71828...$`	```$$ e = 2.71828... $$```
Sum	$\displaystyle\sum_{k=3}^{5} k^2 = 3^2 + 4^2 + 5^2 = 50$	`$\displaystyle\sum_{k=3}^5 k^2=3^2 + 4^2 + 5^2 =50$`	```$$ \displaystyle\sum_{k=3}^5 k^2=3^2 + 4^2 + 5^2 =50 $$```
Series Product	$\displaystyle\prod_{x=2}^{4} x^2 = 2^2 \times 3^2 \times 4^2 = 576$	`$\displaystyle\prod_{x=2}^4 x^2 = 2^2 \times 3^2 \times 4^2 = 576$`	```$$ \displaystyle\sum_{k=2}^4 k^2=2^2 \times 3^2 \times 4^2 = 576 $$```

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| Brackets & Parentheses | $\lfloor...\rfloor (...)$ | $[\ldots] (\ldots)$ | $$
[\ldots] (\ldots)
$$ |

2.5. Angles 🔗

Notation	Example	Inline	Code Block

Angle	$\angle$	`$\angle$`	`$$`
			`\angle`
			`$$`

Degree, Arc Min, Arc Sec	$30\degree 45'30''$	`$30\degree45\rq30\rq\rq$`	`$$`
			`30\degree45\rq30\rq\rq`
			`$$`

Radians	$360\degree = 2\pi rad$	`$360\degree = 2\pi rad$`	`$$`
			`360\degree = 2\pi rad`
			`$$`

2.6. Probability & Statistics 🔗

Notation	Example	Inline	Code Block

Probability of Event A	$P(A)$ or $\Pr(A)$	`$P(A)$ or $\Pr(A)$`	`$$`
			`P(A)`
			`$$`

Intersection Prob. of A & B	$P(A \cap B)$	`$P(A \cap B)$`	`$$`
			`P(A \ca pB)`
			`$$`

Union Prob. of A or B	$P(A \cup B)$	`$P(A \cup B)$`	`$$`
			`P(A \cup B)`
			`$$`

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Conditional Prob. of A Given B	$P(A\vert B)$	`$P(A|B)$`	`$$`
			`P(A|B)`
			`$$`

Median	$\tilde{x}$	`$\tilde{x}$`	`$$`
			`\tilde{x}`
			`$$`

Population Mean	$\mu, \overline{x}, \langle x \rangle$	`$\mu , \overline{x}`
		`, \langle x \rangle$`
			`$$`
			`\mu , \overline{x}`
			`, \langle x \rangle`
			`$$`

Standard Deviation	σ	`$\sigma$`	`$$`
			`\sigma`
			`$$`

Varience	σ^2	`$\sigma^2$`	`$$`
			`\sigma^2`
			`$$`

2.7. Linear Algebra 🔗

2.7.1. Linear Algebra: Vectors 🔗

Notation	Example	Inline	Code Block

Vectors	$\mathbf{v}\overline{v}\vec{v}$	`$`
		`\mathbf{v}\overline{v}\vec{v}$`
			`$$`
			`\mathbf{v} \overline{v`
			`\vec{v}`
			`$$`

Row Vector	$v = \begin{pmatrix} 1 & 2 & 3 \end{pmatrix}$	`$v=\begin{pmatrix}`
		`1&2&3\end{pmatrix}$`
			`$$`
			`v = \begin{pmatrix}`
			`1 & 2 & 3`
			`\end{pmatrix}`

Column Vector	$w = \begin{pmatrix} 4 \\ 5 \\ 6 \end{pmatrix}$	`$w=\begin{pmatrix}`
		`4\cr5\cr6\cr\end{pmatrix}$`
			`$$`
			`w=\begin{pmatrix}`
			`4 \cr`
			`5 \cr`
			`6 \cr`
			`\end{pmatrix}`
			`$$`

Dot Product	$\mathbf{v} \cdot \mathbf{w}$ (v, w) $\langle v \vert w \rangle$	`$\mathbf{v} \cdot` `\mathbf{w}$ $(v,w)$ $` `\left<v \| w\right>$`	`$$` `\mathbf{v}\cdot\mathbf` `(v,w)` `\left<v\|w \right>` `$$`

Cross Product	$v \times w$	`$v \times w$`	`$$`
			`v \times w`
			`$$`

Length of v	$\vert v \vert$	`$\|v\|$`	`$$`
			`\|v\|`
			`$$`

Norm of v	$\vert\vert v \vert\vert$	`$\|\|v\|\|$`	`$$`
			`\|\|v\|\|`
			`$$`

2.7.2. Linear Algebra: Matrices 🔗

Notation	Example	Inline	Code Block

Matrix, 2 By 3	$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$	`$A=\begin{bmatrix}`
		`1&2&3\cr4&5&6\end{bmatrix}$`
			`$$`
			`A=`
			`\begin{bmatrix}`
			`1 & 2 & 3 \cr`
			`4 & 5 & 6`

| | | | $$ |
| | | | $$ |

Product	$A \cdot B$	$A \cdot B$	$$ A \cdot B $$
Hadamard Product	$A \circ B$	$A \circ B$	$$ A \circ B $$
Kronecker Product	$A \otimes B$	$A \otimes B$	$$ A \otimes B $$
Transposed Matrix	A^T	A^T	$$ A^T $$
Hermitian Matrix or Conjugate Transpose	$A^\dagger$ A^*	$A^\dag$ $A^\ast$	$$ A^\dag A^\ast $$
Inverse Matrix	A^{-1}	A^{-1}	$$ A^{-1} $$
Determinant	$\lvert A \rvert$	$\lvert A \rvert$	$$ \lvert A \rvert $$
Norm	$\lvert\lvert A \rvert\rvert$	$\lvert\lvert A \rvert\rvert$	$$ \lvert\lvert A \rvert\rvert $$

2.8. Calculus 🔗

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Example Function: $y = \frac{x^2}{4}$	$y = \frac{x}{4}$	`$y = \frac{x^2}{4}$`	```$$``` ```y = \frac{x^2}{4}``` ```$$```
Integration (Limits: 1 to 4)	$A = \int_1^4 \frac{x^2}{x} dx$	`$A = \int_1^4 \frac{x^2}{x} dx$`	```$$``` ```A = \int_1^4 \frac{x^2}{x} dx``` ```$$```
Differentiation			
First Derivative With Respect To x	$\frac{df}{dx}$	`$\frac{df}{dx}$`	```$$``` ```\frac{df}{dx}``` ```$$```
Partial Derivative With Respect To x	$\frac{\partial f}{\partial x}$	`$\frac{\partial f}{\partial x}$`	```$$``` ```\frac{\partial f}{\partial x}``` ```$$```
First and Second Derivative of Function	f' f''	`$f\rq$` `$f\rq\rq$`	```$$``` ```f\rq``` ```f\rq\rq``` ```$$```
First and Second Derivative With Respect To Time	$\dot f$ $\ddot f$	`$\dot f$` `$\ddot f$`	```$$``` ```\dot f``` ```\ddot f``` ```$$```

2.9. Complex Numbers 🔗

Notation	Example	Inline	Block
Imaginary Unit i	$z = 3 + 2i$	`$z=3+2i$`	```$$``` ```z=3+2i``` ```$$```

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Real Part Of Complex Number	$\Re(z)=3$ $\mathrm{Re}(z)=3$	$\Re(z)=3$ $\operatorname{Re}(z)=3$	```$$ \Re(z)=3 \operatorname{Re} (z)=3 $$```
Imaginary Part Of Complex Number	$\Im(z)=2$ $\mathrm{Im}(z)=2$	$\Im(z)=2$ $\operatorname{Im}(z)=2$	```$$ \Im(z)=2 \operatorname{Im} (z)=2 $$```
Complex Conjugate	$\bar{z}=z^*=3-2i$	$\bar{z}=z^*=3-2i$	```$$ \bar{z}=z^*=3-2i $$```

2.10. Greek Alphabet 🔗

Letter	Lower	Inline	Upper	Inline
Alpha	α	α	A	$\Alpha$
Beta	β	β	B	$\Beta$
Gamma	γ	γ	Γ	Γ
Delta	δ	δ	Δ	Δ
Epsilon	ϵ	ϵ	E	$\Epsilon$
Zeta	ζ	ζ	Z	$\Zeta$
Eta	η	η	H	$\Eta$
Theta	θ	θ	Θ	Θ
Iota	ι	ι	I	$\Iota$

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Kappa	κ	κ	K	$\Kappa$
Lambda	λ	λ	Λ	Λ
Mu	μ	μ	M	$\Mu$
Nu	ν	ν	N	$\Nu$
Xi	ξ	ξ	Ξ	Ξ
Omicron	o	$\omicron$	O	$\Omicron$
Pi	π	π	Π	Π
Rho	ρ	ρ	P	$\Rho$
Sigma	σ	σ	Σ	Σ
Tau	τ	τ	T	$\Tau$
Upsilon	υ	υ	Υ	Υ
Phi	ϕ	ϕ	Φ	Φ
Chi	χ	χ	X	$\Chi$
Psi	ψ	ψ	Ψ	Ψ
Omega	ω	ω	Ω	Ω

◁ Bash: Productivity Shortcuts

3. History Of Adding Math Notation To Markdown Documents 🔗

LaTeX is sometimes stylised as $\LaTeX$. Typesetting is based on $\TeX$, created by Donald Knuth ↗ .

Open source editor, VSCode, supports math typesetting with $\LaTeX$, showing the notation as you type. The Live Preview Pane is enabled with `Ctrl + K V` . No other libraries, extensions or apps need to be installed. Rendering in Live Preview is performed by KaTeX ↗ , a fast, easy-to-use JavaScript library for $\TeX$ math rendering on the web.

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