

Examples

$a^i + b_{j+1} + c_l^h$	<code>\Alt =a^i+b_(j+1)+c_l^h \Alt =</code> (note the space)
$R, \mathcal{R}, \mathbb{R}, \Re, \mathfrak{R}, \mathbf{R}$	<code>R, "R", \scriptR, \doubleR, \frakturR, \Ct1 bR\Ct1 b</code>
$i, \iota, l, \ell, \epsilon, \varepsilon, \phi, \varphi$	<code>i, \iota, l, \ell, \epsilon, \varepsilon, \phi, \varphi</code>
$\emptyset, \infty, \mathfrak{d}$	<code>\emptyset, \infty, 2132\Alt x</code> (hex Unicode)
$\vec{a}, \vec{\alpha}, \hat{a}, \check{a}, \tilde{a}, \overrightarrow{ab}$	<code>a\vec, a\hvec, a\hat, a\check, a\tilde, (ab)\vec</code>
$\acute{a}, \grave{a}, \breve{a}, \grave{a}$	<code>a\acute, a\grave, a\breve, 0311\Alt x \Left a</code>
a', a'', a'''	<code>a'</code> (same as <code>a\prime</code>), <code>a''</code> , <code>a\pprime</code>
$\dot{a}, \ddot{a}, \mathring{a}, \overset{\circ}{a}, \overset{\circ}{a}$	<code>a\dot, a\ddot, 030a\Alt x \Left a, a\above\circ, a\above "o"</code>
$\bar{f}, \overline{f}, \overline{fg}, \overline{fg}$	<code>f\bar, \overbar f, \overbar(fg), (fg)\bar</code>
$\underline{f}, \underbar{f}, \underbar{fg}, \underbar{fg}$	<code>f\ubar, \underbar f, \underbar(fg), (fg)\ubar</code>
\boxed{a}, a_{\square}	<code>\rect a, a_"\rect"</code> (also <code>a_\rect</code>)
$ a , \ a\ , [a], [a]$	<code> a , \norm a\norm, \lfloor a\rfloor, \lceil a\rceil</code>
$\sqrt{a}, \sqrt[3]{a}, \sqrt[4]{a}, \sqrt[n]{a}$	<code>\sqrt a, \cbt a, \qdr a, \sqrt(n&a)</code> (or <code>\root n\of a</code>)
$a \cdot b, a \times b, \langle a, b \rangle$	<code>a\cdot b, a\times b, \bra a,b\ket</code>
$a * b, a \star b, a \oplus b, a \otimes b$	<code>a*b, a\star b, a\oplus b, a\otimes b</code>
$a \vee b, a \wedge b, \neg a, ^a, \sim a$	<code>a\vee b, a\wedge b, \neg a, ^a, \sim a</code>
$a \leq b, a \neq b, a \cong b, a \approx b$	<code>a<=b, a/=b, a~=b, a\approx b</code>
$a \sim b, a \propto b, a \notin B, A \not\subseteq B$	<code>a\sim b, a\propto b, a\in B, A\subteq B</code>
$A \cup B, A \cap B, A \setminus B, A \sqcup B$	<code>A\cup B, A\cap B, A\setminus B, A\sqcup B</code>
$f: a \rightarrow b, a \mapsto b, a \Leftrightarrow b$	<code>f:a->b</code> (or <code>\to, \rightarrow</code>), <code>a\mapsto b, a\Longlefttrightarrow b</code>
$L+1, L-1, L+1, L-1$	<code>L+1, L-1, L"+"1, L"2013\Alt x"1</code> (en-dash)
$m \times n, m \times n, d=1, d=1$	<code>m\times n, m"\times"n, d=1, d"=1</code>
$1 \dots n, a \cdots b, \vdots, \ddots$	<code>1...n</code> (or <code>\ldots</code>), <code>a\cdots b, \vdots, \ddots</code>
$\begin{pmatrix} 0 \\ 1 \end{pmatrix}, \begin{pmatrix} 0 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$	<code>(\matrix(0@1)), (0\atop 1), \pmatrix(1&2@3&4)</code>
$Zp, \mathbb{Z}p, \mathbb{Z}p$	<code>Z\hairsp p</code> (1/18em), <code>Z\thinsp p</code> (3/18), <code>Z\nbsp p</code> (or <code>\Ct1 Shft SP</code>)
$\sum_i a_i, \prod_{i=1}^n a_i, \int_0^1 f(x) dx$	<code>\sum_i a_i, \prod_(i=1)^n a_i, \int_0^1 f(x)\dd x</code>
$\iiint_V f, \oint_{\partial \Sigma}$	<code>\iiint_V f, \coint_(\partial\Sigma) \zwsp</code> (zero-width arg)
$\frac{a}{b}, a/b, a/b, a/b, a \div b, \frac{a}{b}$	<code>a/b, a\div b, a\ldiv b, a\sddiv b, a\div b, ribbon UI fraction \frac{a}{b}</code>
$\arg \max_{\phi, T} f_{\phi, T}$	<code>"arg max" \below(\phi,T) \funcapply f_(\phi,T)</code>
$f = \begin{cases} a & \text{if } y \\ b & \text{if } y \end{cases}$	<code>f={\eqarray(a@ b" if "y)\close</code> or <code>f=\cases(a@ b" if "y)</code>
$f = \begin{cases} a & \text{if } y \\ b & \text{if } y \end{cases}$	<code>f={\matrix(a@ b" if "y)\close</code> "Column Alignment" → Left on $\begin{cases} a \\ b \text{ if } y \end{cases}$
$f = \begin{cases} a+b & \text{if } a < 5 \\ c & \text{otherwise.} \end{cases}$	<code>f={\matrix(a+b&" if "a<5@c&"otherwise.")\close</code>
f^{g^h}	<code>\smash(f^g^h)</code> (reduce vertical space)
$\{x \mid f_x > 0\}, \{x \mid f_x > 0\}$	<code>\x\mid f_x>0\}, \{x\mid f_x>0\vpphantom A^A^A</code> (taller)
$\mathbb{U}, a \otimes b$	<code>\hsmash U "\thinsp I", a\hsmash"\otimes" "\oplus" b</code>
$\tilde{E}'[S[p + \varphi(\Delta)]]$	First apply red text color to $\varphi(\Delta)$, then apply black text color to Δ .

Useful links

Murray Sargent's [reference document](#) and [blog](#).

Equation numbering

This equation is created using a table:

$$e(B) = \sum_{p \in B} \|I'[p] - I[p]\|^2. \quad (1)$$

It rennumbers automatically if copied. We replace its content:

$$x = \int_0^1 e^{-\sqrt{t^2+1}} dt. \quad (2)$$

Creating a reference to “Equation (2)” involves two steps:

- Click on the “2” to the right side of the equation, and perform **Insert** → **Bookmark** with some name such as eq_x.
- Type “Equation ” and perform **Insert** → **Cross-reference** → **BookMark** → **Paragraph number** and select eq_x.

See also these [macros](#) for equation numbers (Office 2007/2010).

Line spacing

Within a paragraph, formulas such as f^g^h may be taller than the paragraph text, e.g., f^{g^h} , resulting in uneven vertical spacing. Instead, we can ignore vertical size using `\smash(f^g^h)` to create the formula f^{g^h} which does not alter the line spacing.

An alternative used in this paragraph is to force the paragraph line spacing to a specific value, here 10pt – thus we get f^{g^h} .

Display versus inline

Display mode: A paragraph containing just a math formula, without any characters before or after the formula, is auto-centered. (The period is *inside* the formula.)

$$\sum_i a + b.$$

Inline mode: To obtain this more compact style, append a space after the formula (or place the period outside the formula) and set paragraph formatting to “center”:

$$\sum_i a + b.$$

To preserve display-mode, insert text inside math using double-quotes, e.g., “ **where** ” in:

$$\sum_i a + b \text{ where } a \neq b.$$

i.e.: `[Alt]=[sum_i a+bRight]` where “ a/=b. [Alt]=.

Horizontal alignment

To align these two equations, we select each “=” and right-click-select **Align** at this Character.

$$(x+a)^n = \sum_{k=0}^n \binom{n}{k} x^k a^{n-k}$$

$$(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \dots$$

Some large equations can be made to fit by using an almost imperceptibly smaller font size (here 8.5pt instead of 9pt):

$$\text{Mag}_{E_H}(p) = \sum_{\Delta=p-|p|-\delta, \delta \in \{\binom{0}{0}, \binom{1}{0}, \binom{0}{1}, \binom{1}{1}\}} w(\Delta) E_H[S[p-\Delta] + \Delta].$$

Other built-in examples

$$f(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos \frac{n\pi x}{L} + b_n \sin \frac{n\pi x}{L} \right)$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots, \quad -\infty < x < \infty$$

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