Introduction to Open Office 2.0 Math Features

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Open Office is my default set of office tools. Open Office is a free tool and it can open and save MS Office documents. It allows you to insert equations into your documents. Here's how it works. You position the cursor where you want an equation. Then click on the

button on one of the toolbars. You'll get a new pane in which you type the instructions to make the equation. Here's the Pythagorean Theorem:

$$c_0^2 = a_0^2 + b_0^2$$

The text for this is `c_0^2 = a_0^2 + b^2_0`. Subscripts are denoted by "_" and superscripts by "^"; note they "commute". If you've ever used LaTeX or TeX, this should look familiar. Whitespace in the text is ignored, but you can add extra spacing if desired.

Let's rewrite this with some different variables:

$$c = \sqrt{\alpha^2 + \Gamma_0^2}$$

The text for this is `c = sqrt{%alpha^2 + %GAMMA^2_0}`. Curly braces are used to group a set of symbols together, lower case Greek letters are prefaced by "%", and uppercase Greek letters have their names written in uppercase.

Sums, products, and integrals are straightforward and consistent:

$$\int_a^b \frac{dx}{\ln x} = \left[\ln|\ln x| + \sum_{i=1}^{\infty} \frac{(\ln x)^i}{i \cdot i!} \right]_a^b$$

whose text is

```
int from a to b {dx over {ln x}} = left [ ln abs{ln x} + sum from {i = 1} to
infinity {(ln x)^i over {i cdot i!}} right ]_a^b
```

You can write vectors in bold like in textbooks or with arrows like on a blackboard:

$$\oint_{loop} \boldsymbol{B} \cdot d\boldsymbol{l} = \mu_0 I + \mu_0 \epsilon_0 \int_{surface} \frac{\partial \vec{E}}{\partial t} \cdot d\vec{s}$$

```
lint from loop bold color blue B cdot d bold color blue l =%mu_0 font serif I +
%mu_0 %epsilon_0 int from surface {{partial widevec E} over {partial t} cdot d
vec s}
```

. Note I colored two of the letters blue and made the current term with a capital i with serifs to avoid confusing it with a lower case L. The default math font is a serif font, but I changed it to sans serif because that's what I prefer.

You can include equations in-line with your text: $A\sqrt{x} + B\,y + C = 0$.

Matrices are easy:

$$3\begin{pmatrix} 1 & 2 \\ a & 4 \end{pmatrix} = \begin{pmatrix} 3 & 6 \\ 3a & 12 \end{pmatrix}$$

```
3 left ( matrix {1 # 2 ## a # 4} right ) = left ( matrix {3 # 6 ## 3a # 12}
right )
```

The following page contains a cheatsheet I made up to help me remember the features I occasionally use but don't have memorized.

$\lim_{x \to b} a$	lim from {x toward b} a
$\sum_{i=0}^{\infty} a_i, \prod a$	sum from {i = 0} to {infinity} a_i, prod a
$\int_{\alpha}^{\beta} \Gamma(x)\,dx$	int from {%alpha} to {%beta} %GAMMA(x) dx
$\iint a\,dS$ $\iiint a\,dV$	iint a dS, iiint a dV
$\oint \vec{a} \cdot \vec{dl}$	lint vec a cdot vec dl
$\vec{a}\ \hat{a}\ \bar{a}$	vec a, hat a, bar a
$\breve{a}\ \mathring{a}$	breve a, circle a
$\overrightarrow{abc}\ \widetilde{abc}\ \widehat{abc}$	widevec abc, widetilde abc, widehat abc
$\dot{a}\ \ddot{a}\ \dddot{a}$	dot a, ddot a, dddot a
$\overline{ab}\ \underline{ab}\ \cancel{ab}$	overline ab, underline ab, overstrike ab
∞	infinity
$\partial\ \nabla$	partial, nabla
$\exists\ \forall$	exists, forall
$\hbar\ \lambda$	hbar, lambdabar
$\Re\ \Im$	Re, Im
$\ldots\ \cdots$	dotslow, dotsaxis
$\vdots\ \iddots\ \ddots$	dotsvert, dotsup, dotsdown
$\begin{bmatrix} x \\ y \end{bmatrix}$	left [stack { x # y } right]
$\underbrace{stuff}_{f}\quad \overbrace{stuff}^{f}$	{stuff} underbrace {f}, {stuff} overbrace {f}
${}^{b}a$	a lsup{b}
${}_{b}a$	a lsub{b}
$\overset{b}{a}$	a csup{b}
$\underset{b}{a}$	a csub{b}
$\begin{matrix} Hello\ world \\ \rho \\ (a) \\ B \end{matrix}$	stack{ Hello world # alignl %rho#alignc(a) # alignr B }
$stuff\ \ stuff$	stuff `stuff
$stuff\ \ stuff$	stuff~stuff
$\pm 1\ \mp 1$	+-1, -+1
$a \cdot b\quad a \times b\quad a \div b$	a cdot b, a times b, a div b
$a \circ b$	a circ b
$a \neq 2$	a <> b
$a \approx 2\quad a \sim b$	a approx 2, a sim b
$a \parallel b\quad a \perp b$	a parallel b, a ortho b
$a \equiv b$	a equiv b
$a \leq b$	a <= b
$a \propto b$	a prop b
$a \wedge b\quad a \vee b$	a and b, a or b
$a \to b\quad a \Rightarrow b$	a toward b, a drarrow b
$\uparrow\quad \downarrow$	uparrow, downarrow
$a \Leftrightarrow b$	a dlrarrow b
$\emptyset\quad \aleph$	emptyset, aleph
$a \in B\quad a \notin B$	a in b, a notin b
$A \cup B\quad A \cap B$	a union b, a intersection b
$A \subseteq B\quad A \not\subseteq B$	A subseteq B, A nsubseteq B
$\mathbb{N}\ \mathbb{Z}\ \mathbb{Q}\ \mathbb{R}\ \mathbb{C}$	setN, setZ, setQ, setR, setC
$a!$	fact a
$\boldsymbol{a}$	bold a
qv	size 16 qv
$\mathsf{qv}\ \ qv\ \ \mathtt{qv}$	font sans qv, font serif qv, font fixed qv
qv	color green qv
$(a)\ \ [a]\ \ \{a\}\ \ \begin{Bmatrix} a \\ b \end{Bmatrix}$	(a), [a], lbrace a rbrace, left lbrace stack {a#b} right rbrace
$[\![c]\!]\ \left[\!\!\begin{bmatrix} a \\ b \end{bmatrix}\!\!\right]$	ldbracket c rdbracket, left ldbracket stack {a# b} right rdbracket
$\lvert x \rvert\ \ \lvert a \rvert\ \ \begin{vmatrix} a \\ b \end{vmatrix}$	abs x, lline a rline, left lline stack {a#b} right rline
$\lVert a \rVert\ \ \begin{Vmatrix} a \\ b \end{Vmatrix}$	ldline a rdline, left ldline stack {a#b} right rdline
$\langle a \vert b \rangle\ \left\langle \begin{matrix} a \\ b \end{matrix} \middle\vert c \right\rangle$	langle a mline b rangle, left langle stack{a#b} mline c right rangle
$\begin{pmatrix} a \\ b \end{pmatrix}$	left (stack{a # b} right)
$\begin{matrix} a \\ b \end{matrix}$	stack {a # b}
$\begin{matrix} a & b \\ c & d \end{matrix}\quad \begin{pmatrix} a & b \\ c & d \end{pmatrix}$	matrix{a # b ## c # d}, left (matrix{a # b ## c # d} right)
$\begin{matrix} inserting \\ newlines \end{matrix}$	inserting newline newlines
$\sphericalangle$	%angle
$\varepsilon\ \varphi\ \varpi\ \varrho\ \varsigma\ \vartheta$	%varepsilon, %varphi, %varpi, %varrho, %varsigma, %vartheta