Rapidly Using Equation Editor in Microsoft Office

Too many teaching resources have bad mathematical typography, with fractions written as ‘¼’ (with the diagonal slash causing students problems particularly at A Level) x’s written as x, $\leq$ as <= and so on.

Using the menus within Office for writing an expression is quite time consuming, particularly if you want to casually put variables like a within sentences (like in this one!). Can we avoid using the mouse?

<u>Entering and Exiting Equation Mode</u>

The key is pressing **Alt + Equals** (while in Word/Powerpoint/Publisher) to go into equation mode. You’ll know if you’ve done this right as you’ll see “*Type equation here*”. If you type some letters you’ll see that the display correctly as algebraic variables. To exit equation mode (so you can go back to normal typing), just press the **Right arrow key** when at the end of an expression.

If there are no ‘normal’ text on the same line as your equation, it will automatically be centered, e.g. compare:

This is some text with $a^2 + b^2 = c^2$ *an inline equation in it.*

$$a^2 + b^2 = c^2$$

If typing non-online expressions/equations, press **Shift + Return** to go to the next line (whereas pressing Return on its own will exit equation mode). This ensures the expressions are lined up.

$$(x+1)(x+2) = x^2 + 2x + x + 2$$
$$= x^2 + 3x + 2$$

While there are ways to line up the = symbols (rather than line up the left of the equations), it may be simplest to use the space key to move the second equation across!

<u>Fractions and Powers</u>

Use the caret symbol, ^, for powers. e.g. type *x^2* followed by the space key, to get x^2. Space is an important key within equation editor, as it ‘autocompletes’ anything typed up to the space.

Bracketing keeps expressions together. For example, *x^y+z* would yield $x^y + z$ because the + autocompletes the power (due to BIDMAS). To get x^{y+z}, use *x^(y+z)*. The brackets will be removed.

Similarly use underscore _ for subscripting, e.g. *x_1* yields x_1.

Use a forward slash for fractions, e.g. *x/2* becomes $\frac{x}{2}$ (after pressing space) and *x/(y+3)* gives $\frac{x}{y+3}$, again noticing the use of bracketing to keep expressions together.

This essentially is it. The remainder of the document details all the things to type to get different structures and mathematical symbols. As always, use the space key to get equation editor to process what you’ve written so far.

Summary

Use **Alt + Equals** to enter equation mode. Press the **Right arrow** at the end of an expression to exit.

Structures

What to type (followed by space)	What it gives you	Notes
x/y	$\frac{x}{y}$	
x/(y+1)	$\frac{x}{y+1}$	
x^2	x^2	
x_2	x_2	
\sqrt(a+b)	$\sqrt{a+b}$	To ensure the root extends over the $a+b$, use bracketing. If you type \sqrt followed by space twice, it will leave a blank box for you to fill.
\cbrt(a+b)	$\sqrt[3]{a+b}$	
sin(2\theta)	$\sin(2\theta)$	Pressing space immediately after sin also works. Same with cos, tan, ln, etc. Note that 'cosec' is not recognised; you need to use 'csc'.
sin^-1(x)	$\sin^{-1}(x)$	
a\bar [space][space]	$\bar{a}$	The first press of the spacebar turns the \bar into the bar symbol. The second press then merges it with the letter (or bracketed expression) before.
a\hat [space][space]	$\hat{a}$	As above.
(AB)\vec [space][space]	$\overrightarrow{AB}$	Note the bracketing is required to ensure the arrow goes over both the A and B.
\sum_(k=0)^n k^2	$\sum_{k=0}^{n} k^2$	Note that the order of the _(k=0) and ^n doesn't matter.
\int^4_2 ln(x)	$\int_2^4 \ln(x)$	As above.
lim_(n->\infty) [space] (1+1/n)^n	$\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n$	
(\matrix(4@0@-1))	$\begin{pmatrix} 4 \\ 0 \\ -1 \end{pmatrix}$	Note that the \matrix structure doesn't give you the brackets (in order to allow you to choose between square and curvy brackets). You need to put the brackets in manually yourself. The @ symbol tells equation editor to go to the next row of the matrix.
[\matrix(1&2@3&4)]	$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$	The & symbol allows you to go to the next column.

Symbols (For Greek letters, capitalise the first letter to get the capital Greek letter)

\div	$\div$	\times	$\times$	\approx	$\approx$
\pi	π	\Pi	Π	\angle	$\angle$
\theta	θ	\Theta	Θ	\propto	$\propto$
\neq	$\neq$	\in	$\in$	\emptyset	$\emptyset$
\doubleR	$\mathbb{R}$	\doubleN	$\mathbb{N}$	\cup \cap	$\cup$ $\cap$
<=	$\leq$	->	$\rightarrow$	\degree	$^\circ$
\infty	∞	+-	$\pm$	\equiv	$\equiv$