

## Using Microsoft Word 2007 to type Mathematics

Successfully writing mathematical material in Microsoft Word is a skill that only comes with patience and practice. This flyer is designed to help you improve the presentation of mathematical material using Microsoft Word 2007.

Inserting mathematical expressions using Word 2007 is different to Word 2003. Word 2003 used Microsoft Equation 3.0 as its equation editor. PowerPoint 2007 continues to use Microsoft Equation 3.0. Equations generated using the new 'equation' in Word 2007 will become images, and will not be editable, if then saved in the old 2003 format. Word 2007 has a new built-in equation editor, which can be accessed through the **Insert** ribbon, **Equation**.



This equation button has access to common equations, which can just be inserted via the drop down arrow. Alternatively, a new equation can be inserted by clicking on the button ( $\pi$  symbol).

Equations can be inserted in-line, for example,  $A = \pi r^2$ , or in a display format (i.e. on a separate line):

$$A = \pi r^2. \quad (1)$$

Whether an equation is in-line or in display format, equations should still follow basic mathematical typesetting rules. For example, there should only be one equal sign per line. As an equation is considered to be part of a sentence it should also use punctuation as normal; that is, commas, semi-colons, colons, and full stops should be used as appropriate (see above as an example).

If a variable is to be used in text (for example,  $x$ ) then it should still be inserted via the **equation** button, to maintain font consistency and avoid confusion. For example, using *italics* Times New Roman gives 'v', but gives 'v' in Cambria Math font, so it is easy to mistake it for a different variable.

The new equation editor in Word 2007 allows equations to be entered manually. Manual entering of equations can be done in two ways. You can either use the symbols and structures from the menus (see ribbon below),



or the formula could be typed just using the keyboard. Using the keyboard you could just type ' $x = (-b \pm \sqrt{b^2 - 4ac}) / (2a)$ ' followed by a space. This will give the quadratic equation:

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

Equations can be presented in two different ways, as 'professional' or 'linear' (see tools section of the ribbon above). A professional example can be seen in Equations 1 and 2. Equation 2 can be rewritten as linear, i.e.  $x = (-b \pm \sqrt{b^2 - 4ac}) / 2a$ . This linear format should only be used for inline equations and avoided for complex equations where a displayed equation is preferable. There is a third tool under these ones called 'normal text', which takes you out of the maths font (i.e. *italic*). This is used when you need to enter units or where the variables need to be typed in **bold** (i.e. vectors or matrices).

To insert a series of equations, each on a new line, insert a formula as per the above instructions. This should give a formula centred on a new line. Once you have typed in the formula, press "shift + enter" to insert a second equation under the first. (Pressing "shift + enter" tells Word that this equation will be part of the previous one). This will give a series of equations one after the other, without lining up the equal signs, as shown below:

$$\begin{aligned}
 A &= \pi r^2 \\
 &= \pi \times 5^2 \\
 &\approx 78.54.
 \end{aligned}$$

Now you need to highlight the equal sign in the first equation and right click, selecting 'align at this character'. Repeat this process for each equal sign in the series of equations. Your equations will now be aligned on the equals sign as shown below.

$$\begin{aligned}
 A &= \pi r^2 \\
 &= \pi \times 5^2 \\
 &\approx 78.54.
 \end{aligned}$$

The final skill you need for well-presented assignments is to include equation numbers. This can be done either manually or automatically. If you are typing small assignments, manual numbering will be easier. To manually include equation numbers (just like you would do if you were hand writing an assignment), you need to insert a three columned table.

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In the middle column place your equations. The Equation number is right aligned, preferably at the bottom of the cell (see the circled tool in the ribbon shown below) in the final column,



which gives,

	$  \begin{aligned}  A &= \pi r^2 \\  &= \pi \times 5^2 \\  &\approx 78.54.  \end{aligned}  $	(3)
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Once this is done, removing the rules from the table gives the equations shown below.

$$\begin{aligned}
 A &= \pi r^2 \\
 &= \pi \times 5^2 \\
 &\approx 78.54.
 \end{aligned}
 \tag{4}$$