The Open University

Using the mathematical features of Word 2007

Important information for Open University students

It is important to note that mathematical notation created in Word 2007 will not be preserved if the document is subsequently opened or saved in a previous version of Word. If a Word 2007 document containing mathematics is to be read on a computer that doesn't have Office 2007 installed, it must first be saved in portable document format (pdf).

As a consequence, Open University students should only use the mathematical features in Word 2007 (and other features only available in Word 2007) for preparation of TMAs in either of the following circumstances:

- if the TMA will be printed out and sent to your tutor on paper
- if you are studying on a course in mathematics where electronic submission of TMAs is permitted.

In all other cases, TMAs to be submitted electronically (that is on non-maths courses where eTMAs are permitted) must first be saved as a Word 97 - 2003 document. You are then advised to check that the saved document contains all aspects of your work prior to submission to the University's main eTMA system. Failure to undertake these steps may mean that your tutor cannot read all your work, and may not even realise that some parts are missing!

Disclaimer

This document has been written by members of the Department of Mathematics and Statistics at the Open University, as a result of their experiences of using the mathematical features of Word 2007. It has not been approved by the developers of Microsoft Office 2007.

Contents

Introduction 3

Accessing the mathematical facilities 3

- Quick Access toolbar 3
- The Symbol command 4
- The Equation ribbon 5

The Equation ribbon in detail 5

- Tools 5
- Symbols 6
- Structures 6

Inputting mathematics 7

- Display of mathematics 7
- Inputting mathematics using palettes 8
- Inputting mathematics using text 9
- Context menus 10
- Useful tips 11
- Aligning expressions 13

Saving expressions 15

Numbering expressions 16

Settings for mathematical text 21

Related resources 23

Appendices 24

- Appendix A: Built-in equations in the Equation Gallery 24
- Appendix B: Symbol palettes 25
- Appendix C: Structures palettes 27
- Appendix D: Text input codes for recognised functions 31
- Appendix E: Mathematics text input codes 32
- Appendix F: Text input of complex structures 34

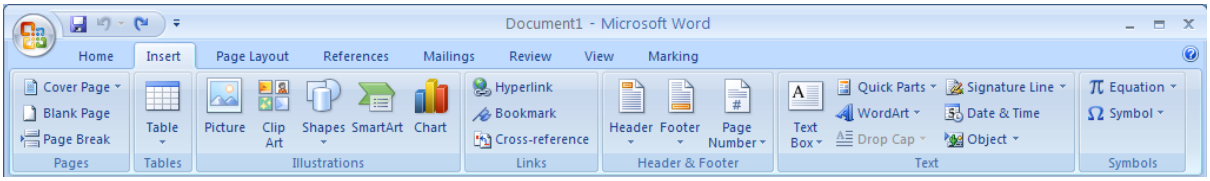
Introduction

This is an introductory guide to using the mathematical features of Word 2007. It assumes that the reader has some familiarity with Word, either Word 2007 or a previous version. It is not a general guide to Word 2007, but does discuss some other features that are required to make best use of the mathematical facilities.

The mathematical tools in Word 2007 are well developed in comparison with earlier versions of Word and with other word-processing packages. Gone is the separate Equation Editor found in previous versions of Word: the mathematical features are now embedded within Word itself.

Accessing the mathematical facilities

Upon opening Word 2007, the mathematical facilities are accessed by clicking on the **Insert** tab (second from left), which reveals the **Insert ribbon**. The **Equation** and **Symbol** commands are found at the right-hand end of the ribbon.

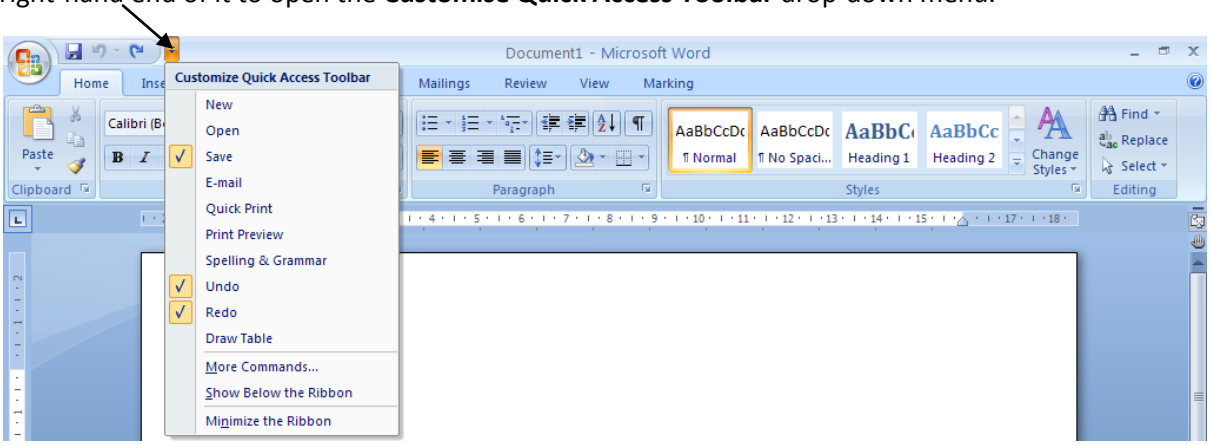


To facilitate access to the **Equation** and **Symbol** commands regardless of which ribbon is currently visible, it is recommended that these are placed on the **Quick Access Toolbar**.

Quick Access toolbar

By default, the **Quick Access toolbar** is at the top of the Word 2007 window, next to the Office button, and will contain the **Save**, **Undo** and **Redo** commands. Your choice of frequently used commands can be added so that they are always available, irrespective of which ribbon is visible.

First, however, it is suggested that you move the Quick Access toolbar to appear immediately above the document itself. To customize the Quick Access toolbar, click on the small down arrow at the right-hand end of it to open the **Customise Quick Access Toolbar** drop-down menu.

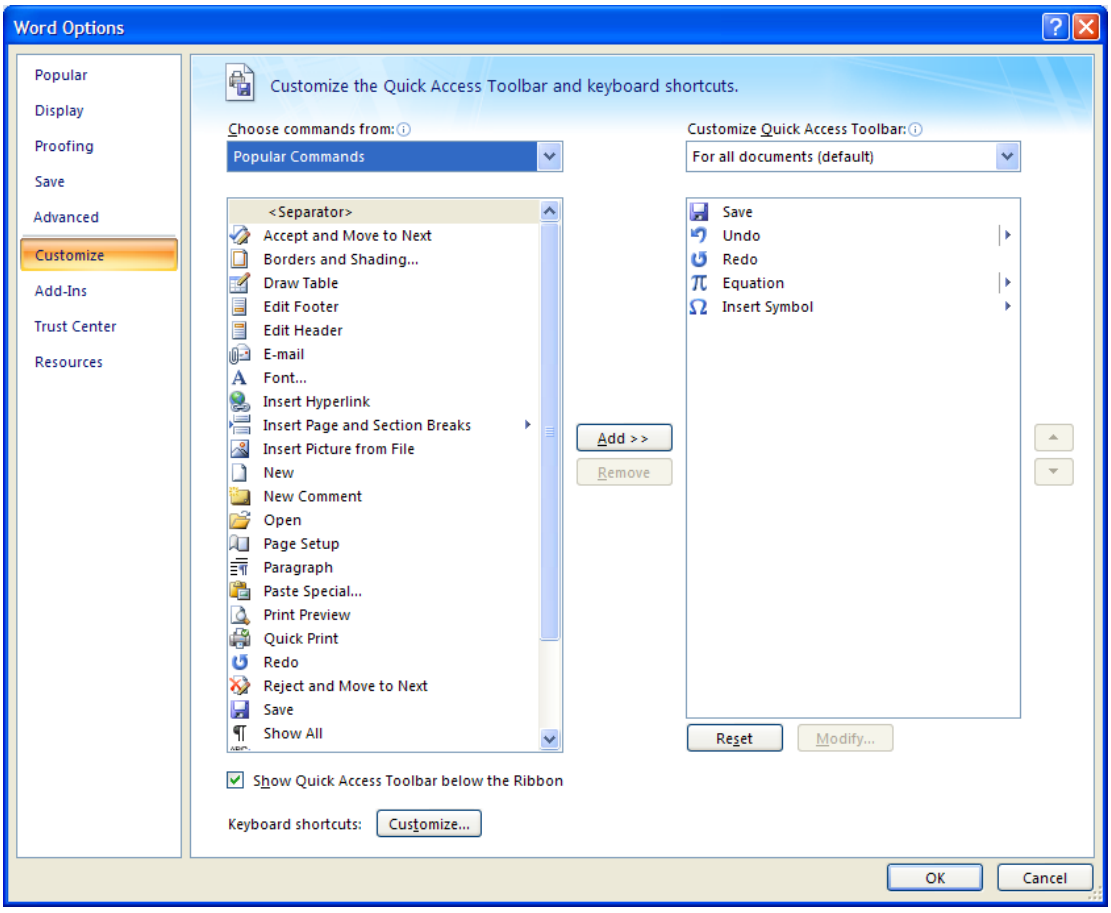


From the menu, select **Show Below the Ribbon**, and the Quick Access toolbar will move down.

There are two ways to add commands to the Quick Access toolbar. The most straightforward is to right click on the required command icon on any ribbon.

For example, to add the **Equation** command from the Insert ribbon, right click on the π **Equation** icon and select **Add to Quick Access Toolbar**. Similarly for the Ω **Insert Symbol** icon.

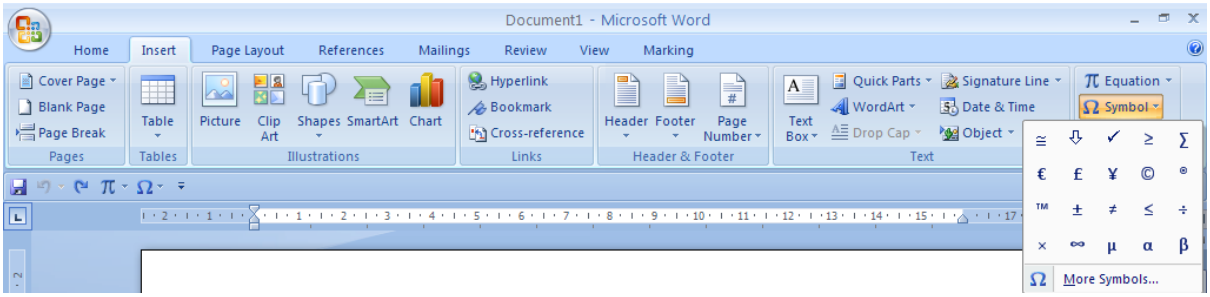
Alternatively, right click anywhere on the Quick Access toolbar and select **Customize Quick Access Toolbar**. Access **Popular Commands** (or **All Commands**) in the drop-down menu at the top left.



Scroll down to find the command you want, and click **Add**. To change the order in which the commands appear on the Quick Access toolbar, click on one of the commands in the list on the right, and use the up and down arrows to the right to change its position.

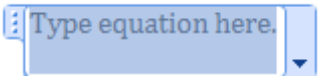
The Symbol command

Click on the Ω **Insert Symbol** icon, either on the Insert ribbon or on the Quick Access toolbar, to reveal a small palette of common symbols. Click on one of the symbols to immediately insert it into text. Click on **More Symbols** to reveal the Symbol window, which works in a similar way to that found in previous versions of Word. Inserting a symbol from the Symbol window will place that symbol at the top of the palette shown when the Ω **Insert Symbol** icon is next clicked.

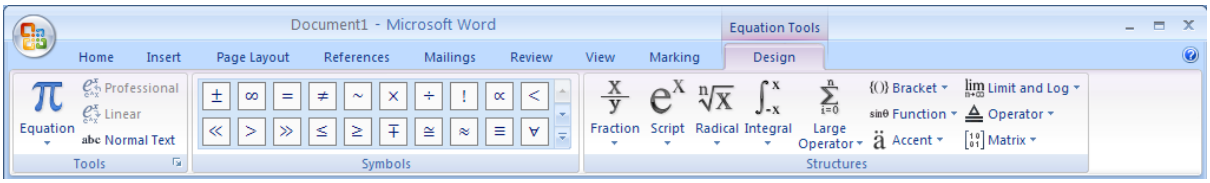


The Equation ribbon

Click on the π **Equation** icon, either on the Insert ribbon or on the Quick Access toolbar, and immediately both the **Equation** ribbon will become visible and a mathematical input box will appear at the current insertion point.



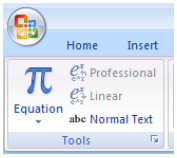
Exactly the same thing will happen if you key Alt+= (i.e. hold down the Alt key and type =). Keying Alt+= again returns you to standard text mode. Using Alt+= is thus the easiest way to toggle between mathematics input mode and standard text mode.



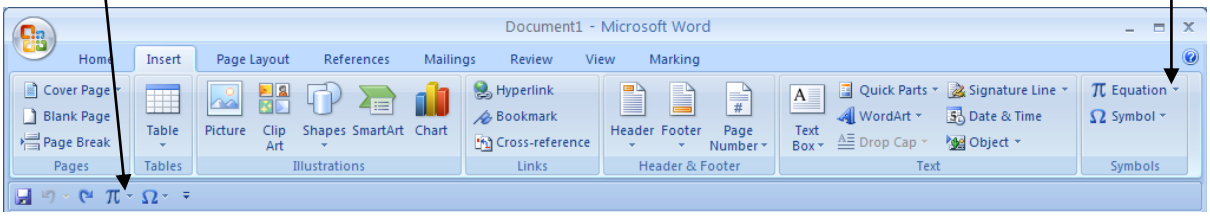
The Equation ribbon has three sections – Tools, Symbols and Structures – which are described in the next section.

The Equation ribbon in detail

Tools

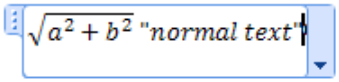


In the Equation ribbon, click on the π **Equation** icon to reveal a gallery of **built-in** common equations. This can also be accessed by clicking on the small down arrow next to the π **Equation** icon on the Insert ribbon, or by clicking on the small down arrow next to the π **Equation** icon on the Quick Access toolbar. The default built-in equations are listed in Appendix A.



Clicking on one of the built-in equations will immediately paste it into the currently active mathematical input box, where it can then be edited. Details of how to add your own equations to this gallery will be given later.

The **Normal Text** option in Tools allows you to insert non-mathematical text within a mathematical input box. This can also be achieved by typing double quotes around the normal text within the mathematical input box.

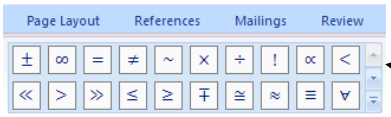


This, with a space after the closing double quotes, produces

$$\sqrt{a^2+b^2}\ \text{normal text}$$

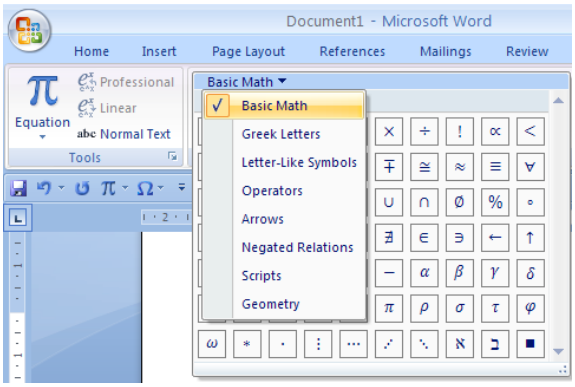
Symbols

Clicking on one of the visible symbols will immediately paste it into the currently active mathematical input box.



Further symbols on the current palette can be accessed by scrolling using the up and down arrows at the right-hand side. Click on  to reveal the whole of the current symbol palette.

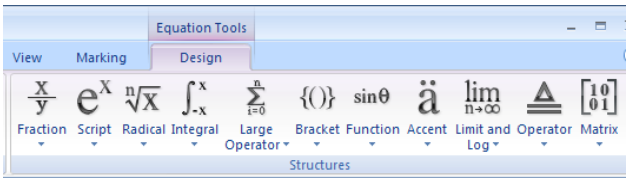
Click on the down arrow immediately to the right of Basic Math to reveal a drop-down menu of all the symbol palettes. A full list of the contents of all these palettes is given in Appendix B.



After one of the palettes has been selected, it will appear on the Equation ribbon until another palette is selected.

To add the symbol palettes to the Quick Access toolbar, right click on the word **Symbols** on the Equation ribbon, add select **Add to Quick Access Toolbar**, where it will then appear with the ∞ icon.

Structures



Click on any one of these icons to reveal a palette of structures that can be used singly, or in combination, to build up mathematical expressions. When you click on a structure, it will immediately be pasted in to the currently active mathematical input box. Further information on how to use the structures is given in the subsection below on 'Inputting mathematics using palettes'.

Inputting mathematics

Word 2007 has two input modes for mathematical expressions. The first is the graphical user interface (GUI) via the Structures palettes, which are most naturally accessed using a mouse. The second uses the keyboard to type in keywords and symbols that are automatically rendered as properly formatted mathematical expressions, as given by the Structures palettes. This automatic build-up process gives almost instant feedback, so that corrections can be made as the mathematical expression is being created. This keyboard approach is very similar to professional mathematical typesetting programs, such as TeX and LaTeX. Henceforth in this document, the two input approaches will be referred to as 'palette' and 'text', respectively.

In both approaches, the automatic build-up process will ensure that the size of brackets, fractions, square roots, etc. will be increased to accommodate whatever expression is created within them.

In fact, any mathematical expressions can be built up using a mixture of these approaches, as it is easy to move between the two. Typically, palettes are used for creating complicated expressions and text mode is used for simple expressions, whether they are within a complicated structure or on their own.

Any of the symbols available from the Symbols palettes, or those typed directly from the keyboard, such as +, =, <, >, |, *, £, %, etc., can be used within expressions created by either input method.

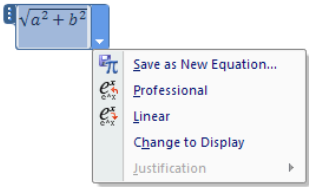
Display of mathematics

To select a mathematical input box, click on any part of the expression it contains.

Professional and linear display

Word 2007 has two display modes, **professional** and **linear**. Professional display mode corresponds to standard mathematical notation, and is the default display mode when using either of the input approaches (as a result of the automatic build-up process in the case of text input).

For example, $\sqrt{a^2 + b^2}$ is displayed in professional mode. It can be changed to linear display by clicking on the down arrow to the right of the expression in the mathematical input box, which reveals a drop-down menu.

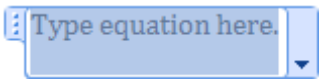


Selecting **Linear** will alter how the above expression appears to $\sqrt{(a\text{^}2 + b\text{^}2\ )}$. The expression can be returned to professional mode using the drop-down menu again.

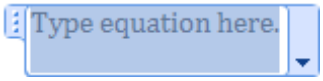
The linear display consists of a sequence of inline characters, known as Unicode characters. It is thus possible to view the syntax required for an expression if it were to be created using text input.

Inline and display

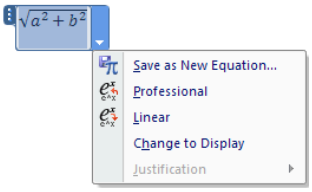
Word 2007 distinguishes inline mathematics, which is shown within a paragraph of (normal) text, and that which is displayed in separate paragraphs, as found in most published mathematical material. A mathematical input box created within a paragraph of text will be inline. For example,

typing Alt+= here creates 

within the line of text, whereas a mathematical input box created in new a paragraph will be displayed – for example:



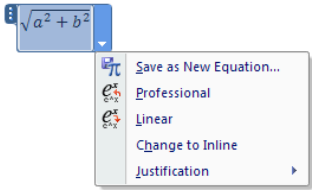
Thus $\sqrt{a^2 + b^2}$ is inline. It can be changed to display by clicking on the down arrow to the right of the expression in the mathematical input box.



Selecting **Change to Display** will alter how the expression appears to

$$\sqrt{a^2 + b^2}$$

The expression can be returned to inline using the drop-down menu again.



Inputting mathematics using palettes

Click on a structure within a palette to paste it into the currently active mathematical input box. For example,  produces  after clicking the cursor away from the mathematical input box.

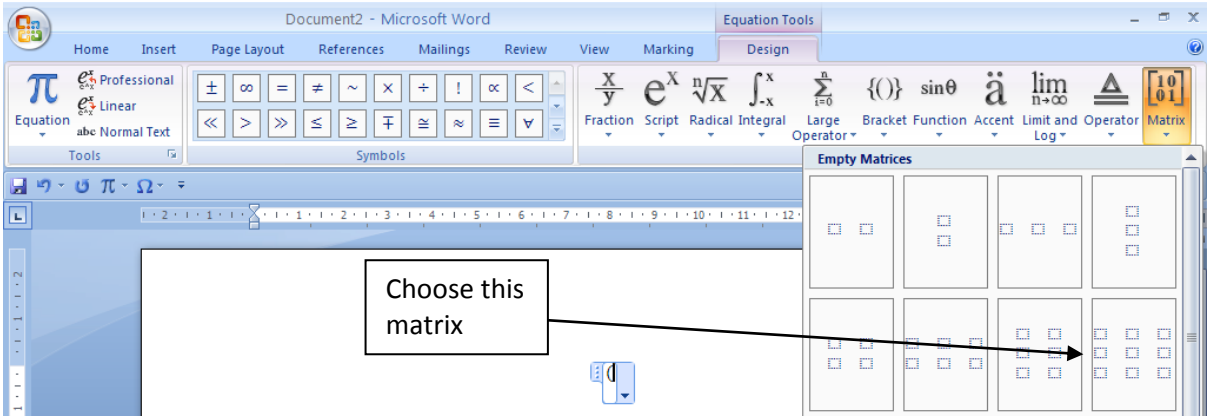
Any resulting placeholders (each indicted by a blank square with a dotted frame) can be filled with numbers, letters, symbols or another structure, or any combination of these, by clicking on the placeholder so that it becomes a blue square. You can move between placeholders using the keyboard up/down, right/left arrow keys.

Any expression selected from one of the palettes can subsequently be edited. For example, $\sqrt{a^2 + b^2}$ selected from the Radical palette could be modified to $\sqrt{(ax)^2 - \pi b^2}$.

By way of an example, to obtain the 3×3 matrix

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

type a left parenthesis, i.e. (, choose the 3×3 matrix from the Matrix palette, and then type), i.e. a right parenthesis, followed by a space. Fill in the entries by selecting each box in turn. Note that the parentheses are correctly sized only after a space is keyed in after the closing parenthesis.



The contents of all the Structures palettes are listed in Appendix C.

Inputting mathematics using text

When mathematics is input as text, keywords are replaced by appropriate Unicode characters and the expression is built up (i.e. formatted as standard mathematical notation) as soon as its structure is unambiguous. This often occurs after typing a space (which is usually deleted by Word 2007 after automatic build-up).

The text input codes for simple expressions are reasonably intuitive. Text input codes for functions, such as those in the first five rows of the following table of examples, are listed in Appendix D. The mathematics text input codes, such as those in the remainder of the table, are listed in Appendix E.

Within a mathematical input box, type the following and then a space	**To produce**
x^2	x^2
x_2	x_2
/	$\frac{\square}{\square}$
sin	$\sin\square$
log	$\log\square$
\pi	π
\theta	θ
\sigma	σ
\Sigma	Σ
\infty	∞
\geq	$\geq$
\sqrt	$\sqrt{\square}$
\angle	$\angle$
\quadratic	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
\pm (*or type* +-)	$\pm$
\doubleR	$\mathbb{R}$

The text input codes can be combined. For example, typing \pi\approx 3.142 gives $\pi \approx 3.142$.

More complex expressions can then be constructed. For example, typing

d/dx␣(x^2␣sin␣(x))=2x␣sin␣(x)−x^2␣cos␣(x)␣

where ␣ indicates a space, gives

This is displayed in linear mode

$$\frac{d}{dx}\left(x^2 \sin(x)\right) = 2x \sin(x) - x^2 \cos(x)$$

This is displayed in the default professional mode

Note that the spaces (indicated by ␣) are used by Word 2007 to decide when a mathematical expression is terminated. The spaces are removed and replaced by Word 2007's own spacing. Such characters are known as delimiters. Although it is possible to input extra spaces, this is discouraged as it is generally better to allow Word 2007 to handle the typography.

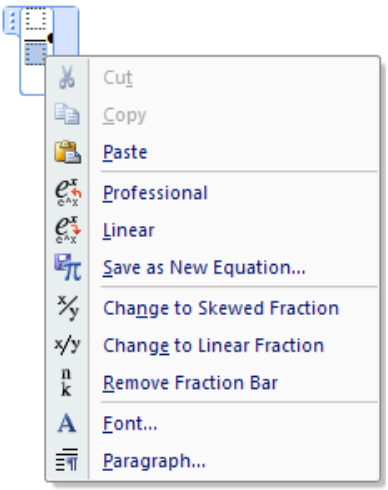
Delimiters are created by pressing the Spacebar or Enter, or by typing a punctuation mark, such as a parenthesis, after you type a text input code. In order to group characters, you can use parentheses ( ), which are then removed on build-up. Extra parentheses may also be added for clarity. For example, typing x^(y+z) gives x^{y+z}, whereas typing x^((y+z)) gives $x^{(y+z)}$.

Further examples of creating mathematical expressions using text input are given in Appendix F.

Warning: in most cases, a mathematical expression may be interpreted from its linear mode, at least by a professional mathematician. However, in some cases (such as for matrices) the glyph (i.e. the symbol) representing the Unicode character (for example, π is the glyph for the Unicode \pi) is not at all obvious. In such cases it may be easier to use the palettes to create the expression.

Context menus

Regardless of how a mathematical expression is input or displayed, individual structures within it can be modified using the associated context menu. To access a context menu, ensure that one or more of the placeholders created as part of the structure are highlighted, and then right click. For example, for a fraction the following context menu is available, which gives three options specifically associated with fractions.



The options offered will depend on the type of structure and on which placeholder(s) are currently highlighted, regardless of whether the placeholder(s) contain any content or not.

The options offered for each of the basic types of structures that have context menus are as follows.

Fraction	Change to Skewed Fraction Change to Linear Fraction Remove Fraction Bar
Script	Remove Superscript/Subscript Increase/Decrease Argument Size Align/Remove Scripts Place Scripts before/after Base
Radical	Remove Radical Show/Hide Degree Increase/Decrease Argument Size
Integral **Large Operator**	Change Limit Locations Show/Hide Lower/Upper Limit Stretch N-ary Operator Increase/Decrease Argument Size
Bracket	Insert Argument Before/After Remove Enclosing Characters/Characters and Separators Remove/Add Opening/Closing Bracket Stretch Brackets (default is for this to be selected) Match Brackets to Argument Height Delete Argument
Accent	Remove Accent Character Place/Remove Character above/below Text Increase/Decrease Argument Size Place Limit/Bar above/below Base Remove Limit/Bar
Limit and Log	Remove Subscript/Limit Increase/Decrease Argument Size Place Limit above Base
Operator	Increase/Decrease Argument Size Remove Character above/below Text
Matrix	Hide Placeholders Insert (rows/columns before/after) Delete (rows/columns) Matrix Spacing Matrix Alignment (top/center/bottom) Column Alignment (left/center/right)

Useful tips

Negative sign

To get what appears to be a 'long' minus sign without going into mathematics text mode, do one of the following:

- use Ctrl Shift +- (i.e. Ctrl plus Shift plus the usual hyphen)
- use Ctrl plus the negative sign on the number pad
- type --, that is, two normal hyphens

followed, in each case, by a space, then a letter or word (not a bracket, full stop, etc.), then another space. What you've typed will then automatically change to a long hyphen, i.e. – (properly known as an en-dash). Note, however, that unlike a negative value created in mathematics text mode, an expression such as –2 may split across lines.

Bold for vector quantities

To make characters bold, for example to indicate vector quantities, either select them individually and then select the bold **B** on the Home ribbon, or key Ctrl+b before the required character. This works within mathematical expressions, for example $\boldsymbol{x}_i$, as well as in normal text. Keying Ctrl+b again will toggle the bold function off.

x-bar for mean

To produce the $\bar{x}$ notation, key in Alt+= then x\bar followed by two spaces (or one space and a further character, such as =). The two spaces are required to centre the bar over the *x*.

Other keyboard shortcuts

Normal text

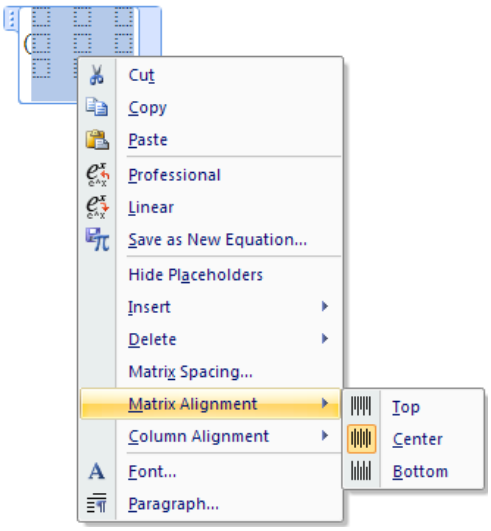
Ctrl+b	Toggle Bold (useful for vectors)
Ctrl+i	Toggle Italic – note that this not the same as mathematical input
Ctrl+u	Toggle Underline
Ctrl+=	Subscript
Ctrl+Shift++	Superscript
Alt+=	Toggle mathematics mode
Ctrl+z	Undo last action (usually)

Mathematics text

Ctrl+b	Toggle Bold (useful for vectors)
Ctrl+u	Toggle Underline for the whole expression
Ctrl+z	Undo last action (usually)
Shift+Enter	New line in expression

Matrices

Inserting additional spaces either immediately before or immediately after an element in a matrix may affect the vertical alignment of the elements within the matrix. Alignment can be altered by right clicking on a matrix displayed in professional mode (i.e. accessing the context menu) and selecting Matrix Alignment, Column Alignment or Matrix Spacing (for more advanced options).

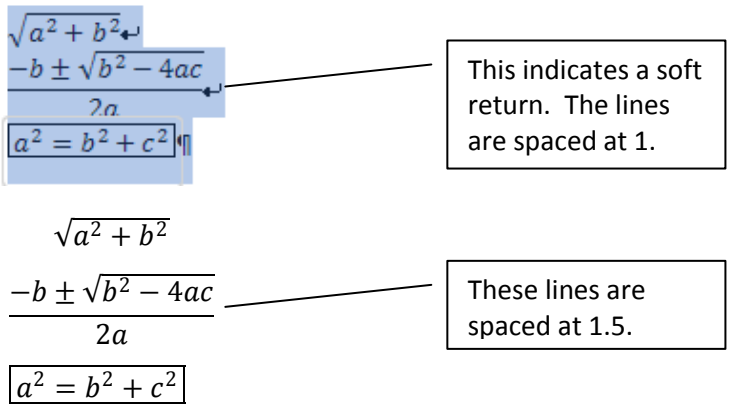


Similarly, the size of a matrix can be altered by selecting Insert or Delete rows/columns. If a particular size of matrix that you use frequently is not available on the Matrix palette, then right click on the matrix of the desired size, and select Save as New Equation (see the section entitled 'Saving expressions').

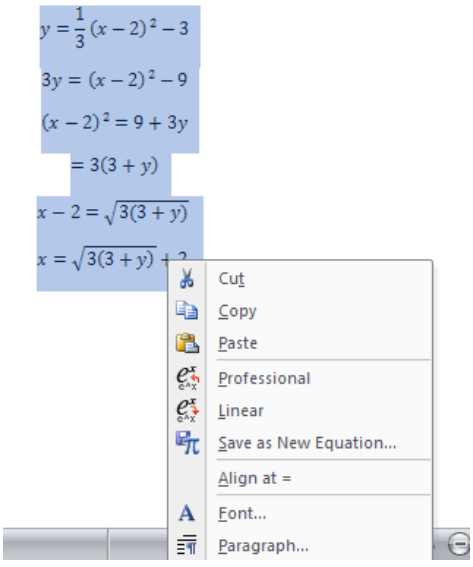
Aligning expressions

Within a mathematical input box, use Shift+Enter (known as a soft return) to insert a new line in order to key in a follow-on expression. Using just Enter will put the cursor at the beginning of a new paragraph, i.e. not in a mathematical input box.

If a series of expressions appear too bunched up vertically, this can be addressed by selecting all the expressions and increasing the line spacing via the **Line spacing** button in the Paragraph section of the Home ribbon.



Once you have entered all your expressions, in order to line them up on the equals sign, select all the expressions, right click, and select **Align at =**.



For example, these two expressions are not aligned at =.

$$\sqrt{a^2+b^2} = y$$

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

Whereas these are aligned at =.

$$\sqrt{a^2 + b^2} = y$$

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

It is also possible to align on an individual character, within each expression, by inserting alignment points at the relevant point in each expression. To do this, right click at the required alignment point and select **Align at this Character**. Then do the same in each of the other expressions. Note that it doesn't seem to be possible to align on a point within, for example, a square root.

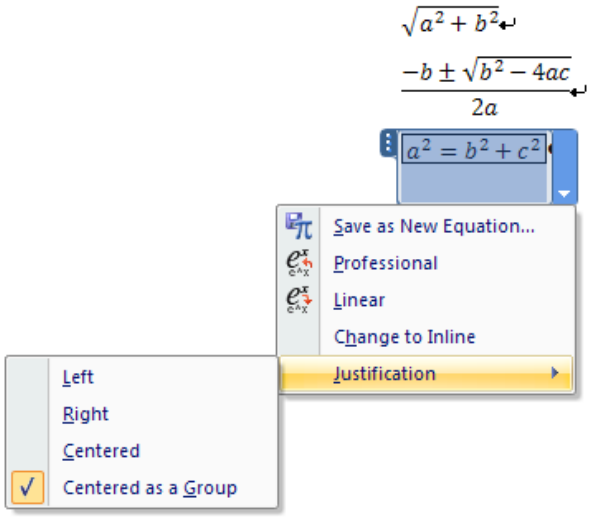
$\sqrt{a^2 + b^2} = y$

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

These are the alignment points.

Alternatively, displayed expressions can be aligned using the **Justification** options available by clicking on the down arrow to the right of the expression in the mathematical input box, which reveals a drop-down menu.

Left and **Right** align mathematical expressions to the left or right of the page, as expected.



The following expressions are **Centered as a Group**.

This text is within the mathematical input box $\sqrt{a^2 + b^2}$

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ and so is this

$\boxed{a^2 = b^2 + c^2}$

And here are the same three expressions **Centered**.

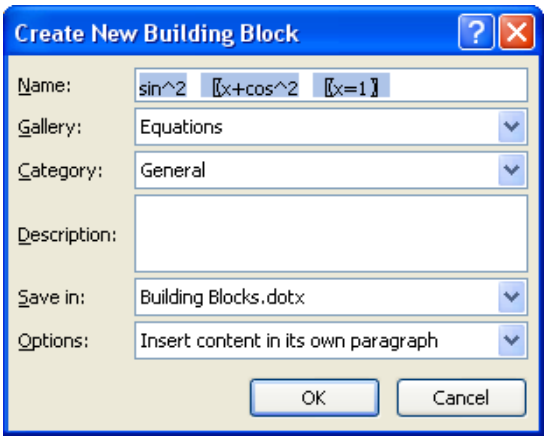
This text is within the mathematical input box $\sqrt{a^2 + b^2}$

$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ and so is this

$\boxed{a^2 = b^2 + c^2}$

Saving expressions

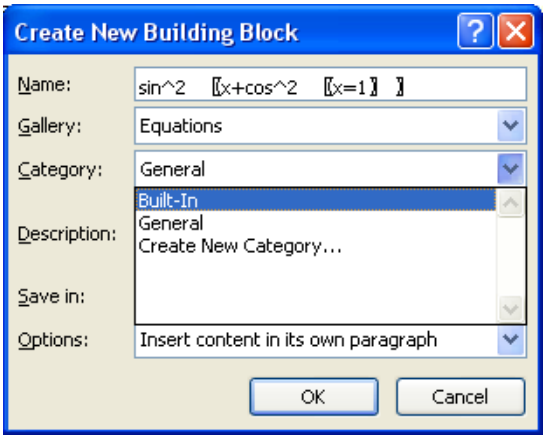
It is possible to store additional mathematical expressions into the Equation Gallery. Having created the new expression, click on the down arrow to the right of the expression in the mathematical input box, which reveals a drop-down menu, and select **Save as New Equation**. Alternatively, select the whole expression to be saved, and on the Insert ribbon, click on the small down arrow next to the π **Equation** icon and select **Save Selection to Equation Gallery**. The following dialogue box appears.



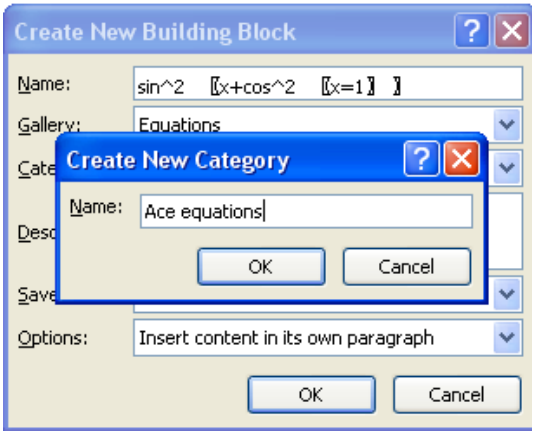
For **Name**, key in a relevant and memorable name for the mathematical expression to be saved, noting that saved expressions are listed alphabetically by name in the Equation Gallery. It is possible to leave the name as suggested by Word 2007, as in the above example when the following expression was to be saved to the Equation Gallery.

$$\sin^2 x + \cos^2 x = 1$$

Note that by default new expressions will be saved to the General category, which will appear below the list of Built-In expressions in the Equation Gallery, as categories are also listed alphabetically. New expressions can be saved in the Built-In category by opening the Category pull-down menu and selecting Built-In.



Alternatively, you can use Create New Category, and give your category a name starting with the letter A, so that all expressions saved in that category appear above the Built-In ones in the gallery.

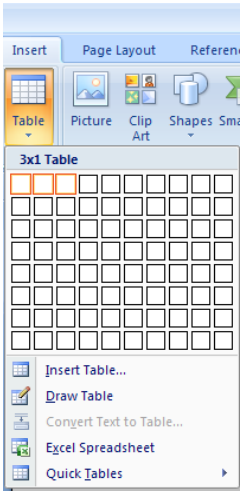


Numbering expressions

The content of this section has been derived from material available on the Microsoft Office Word Team's Blog
(see http://blogs.msdn.com/microsoft_office_word/archive/2006/10/20/equation-numbering.aspx).

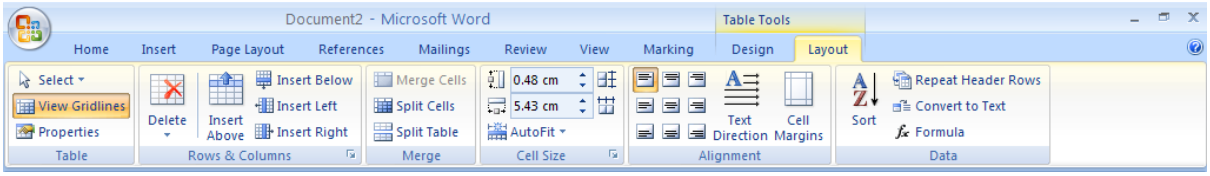
The best approach to numbering expressions is to set up a table, to contain an expression and its respective number, which is then saved in the Equation Gallery, making re-use very quick and easy. The procedure to set up the table is described next.

From the Insert ribbon, select and insert a 3 × 1 table. Your expression(s) will be placed in the centre column and the expression numbers in the left or right column, as you prefer, but creating a table with three columns ensures that expressions will be centred horizontally on the page.

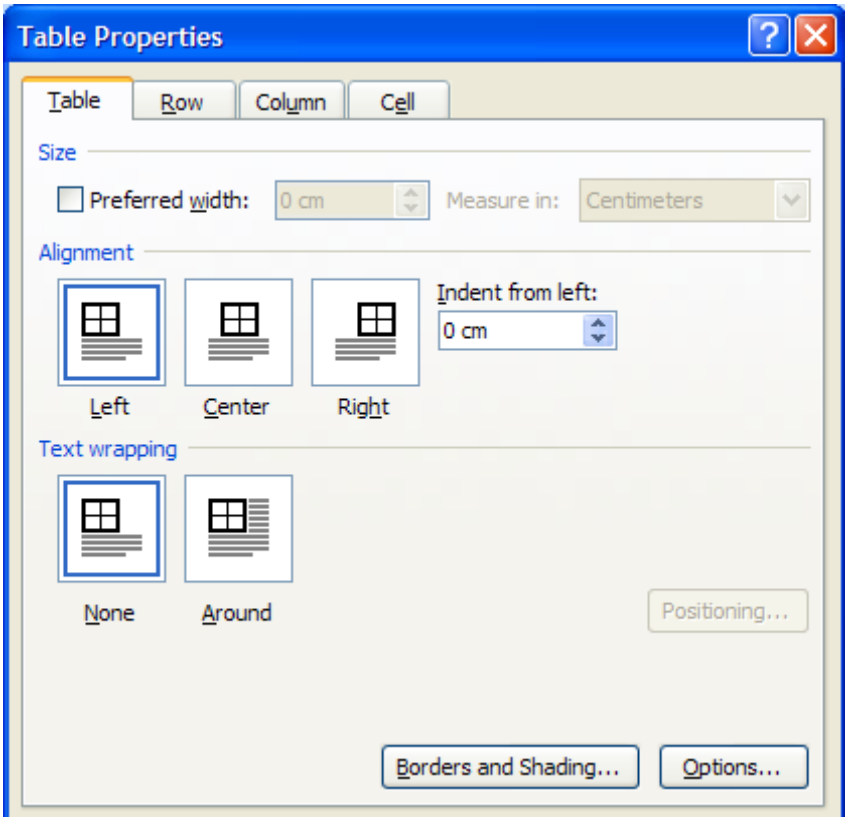


Next, to ensure that your table is laid out properly, so that the expressions are centred horizontally on the page and the expression numbers are centred vertically with respect to the expression, carry out the following steps.

1. With the cursor within the table, click on the Table Tools Layout tab. First click on View Gridlines to ensure that it is highlighted.

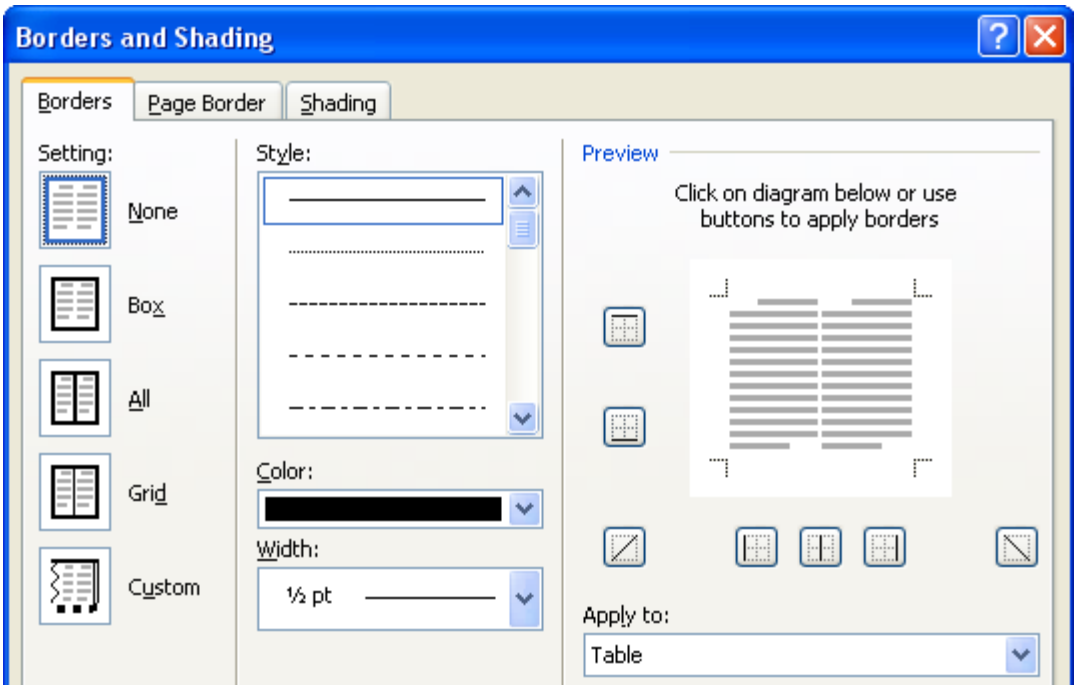


2. Then click on Properties to get the Table Properties dialogue box.

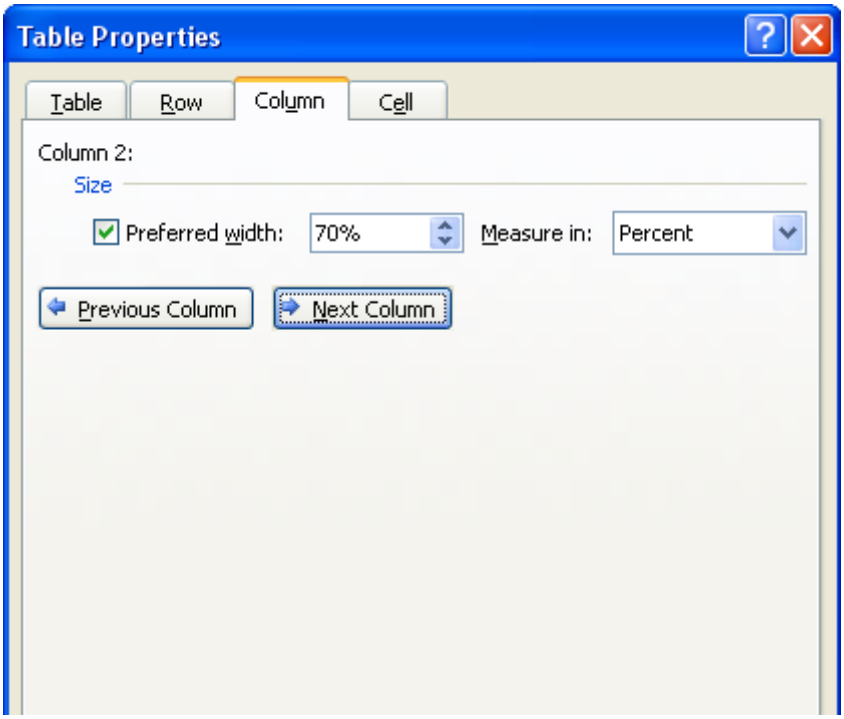


3. On the Table tab, under Size select Preferred width and set 'Measure in' to Percent, and make the preferred width 100%. This ensures that your table takes up the whole width of the page.

4. While in the Table tab, click on Borders and Shading, and select None for the Borders Setting.



5. On the Column tab, under Size select Preferred width and set ‘Measure in’ to Percent.



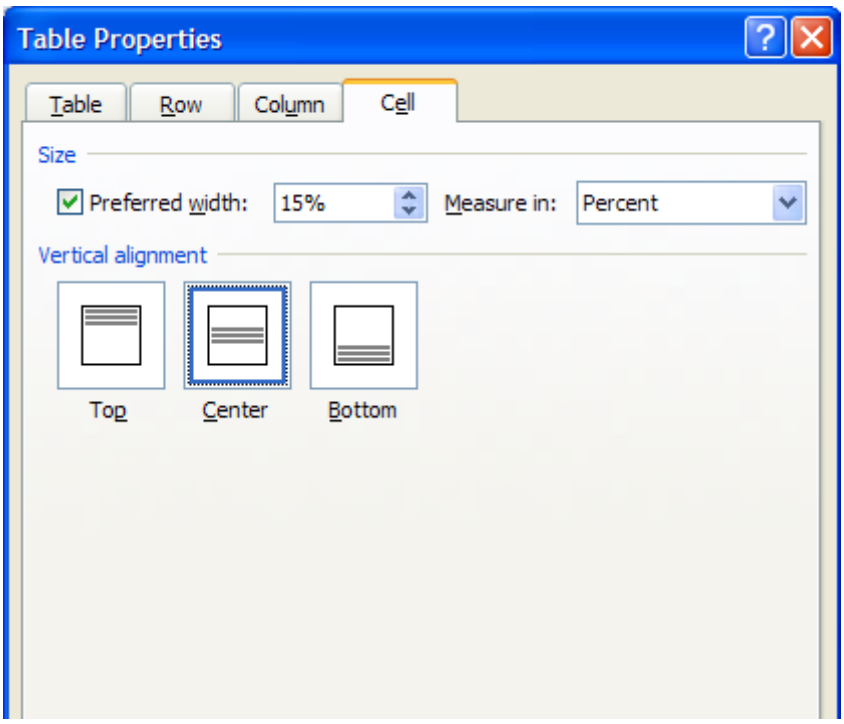
It is suggested that you set the columns to the following widths:

Column 1: 15%

Column 2: 70%

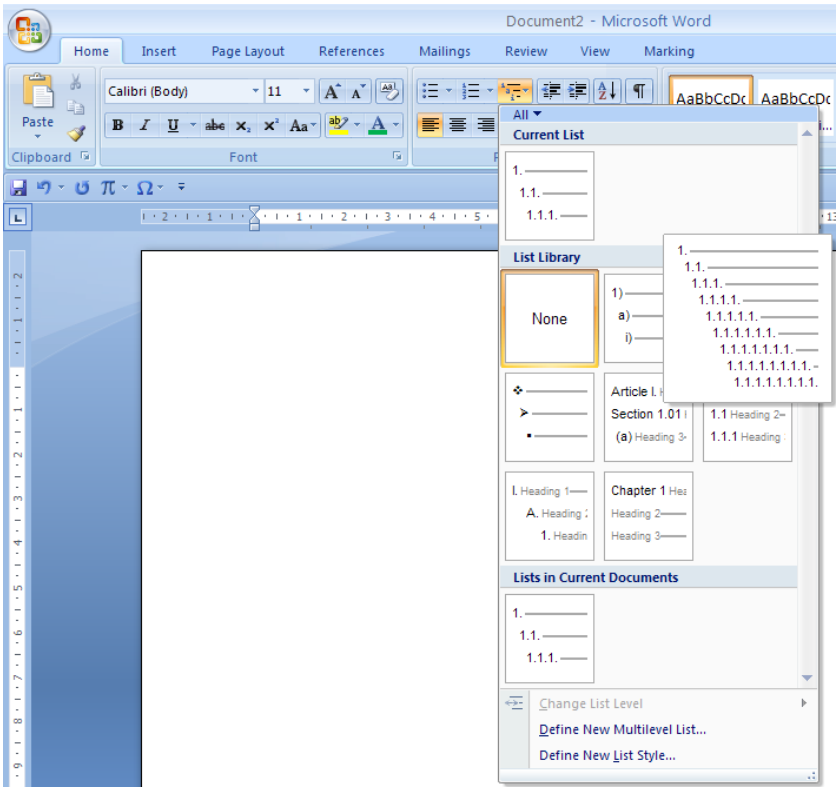
Column 3: 15%

6. Determine if you want your expression numbers to be on the left or right of the expression. For the purposes of illustration, we will assume right. Click in the right cell of the table, and on the Cell tab, select Center under Vertical alignment. This keeps the expression numbers centred against expressions that vertically straddle more than one line.

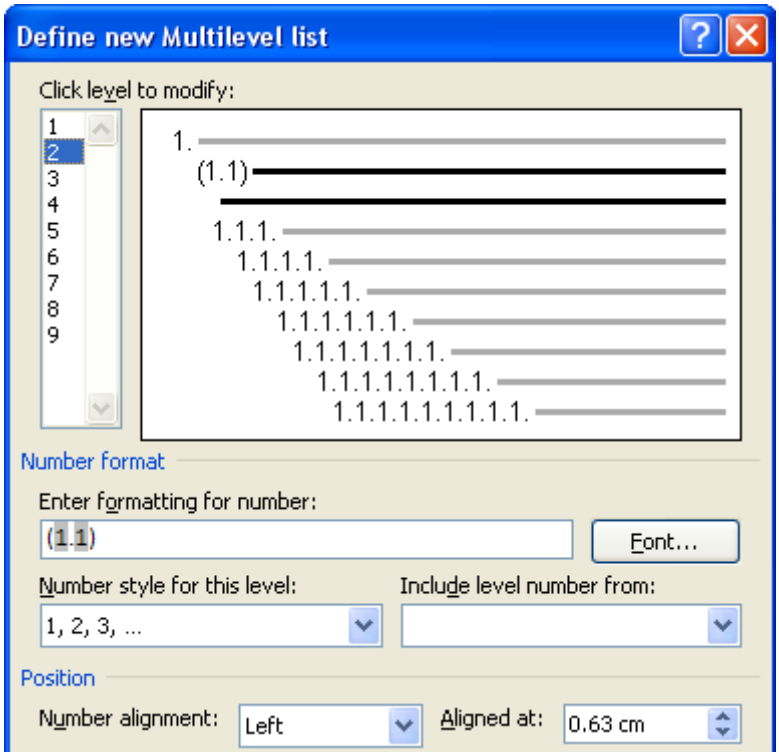


7. Finally, click OK to accept all the changes.

The next stage is to add the numbering system. Start by clicking in the table cell where the numbers are to appear: the right-hand cell in our case. On the Home ribbon, click on Multilevel List in the Paragraph section. If need be, click on the format under List Library closest to the required format for your numbering system (probably 1, 1.1, 1.1.1, …), in order to change the Current List.



Then click on Define new Multilevel List, which initially uses the format shown under Current List.



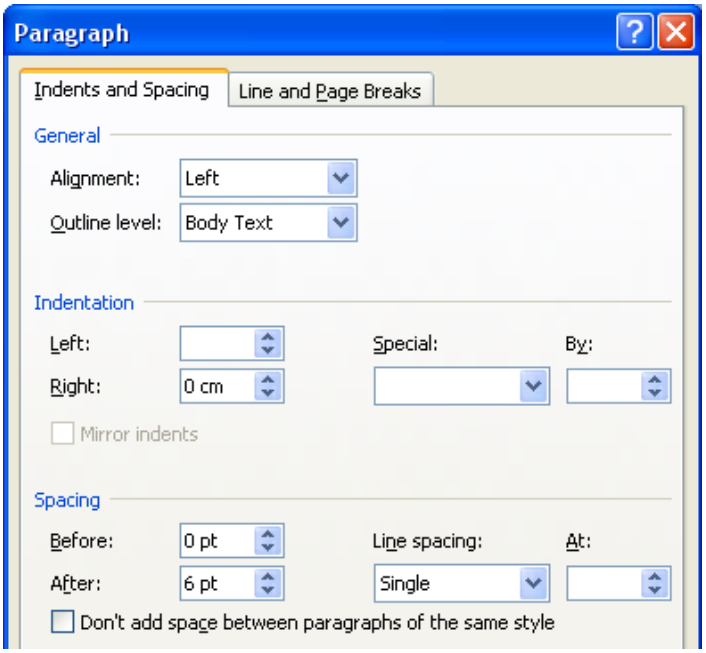
In this dialogue box, for each level of numbering that you require, adjust the formatting for the number as you wish by, for example:

- removing extraneous punctuation, such as the full stop at the end of each number
- adding parentheses
- redefining level 1 to be (1.1), and level 2 to be (1.1.1), etc.

Your table should now look something like this:

		(1.1)

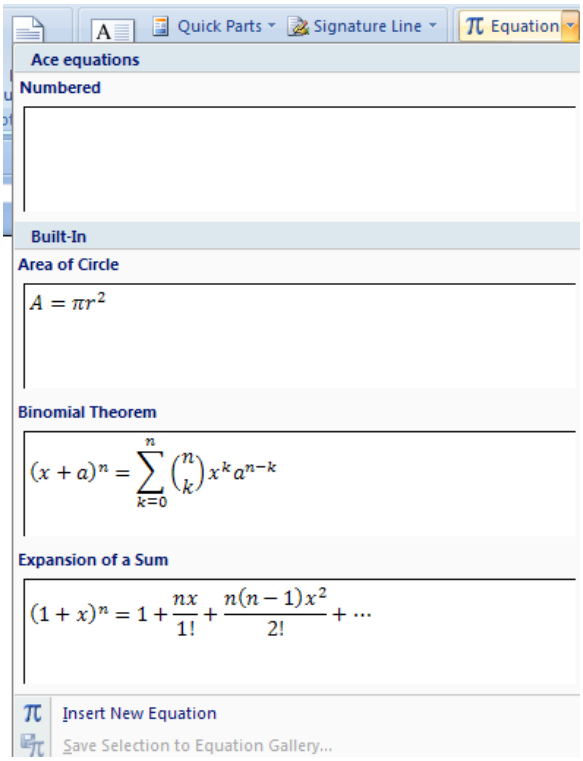
You may now wish to adjust the spacing before and after the table, to match the before and after paragraph spacing in the surrounding paragraphs, so that your expression is vertically centred between the preceding and following paragraphs. To do this, select the whole table, then click on the Paragraph group on the Home ribbon to bring up the Paragraph dialogue box.



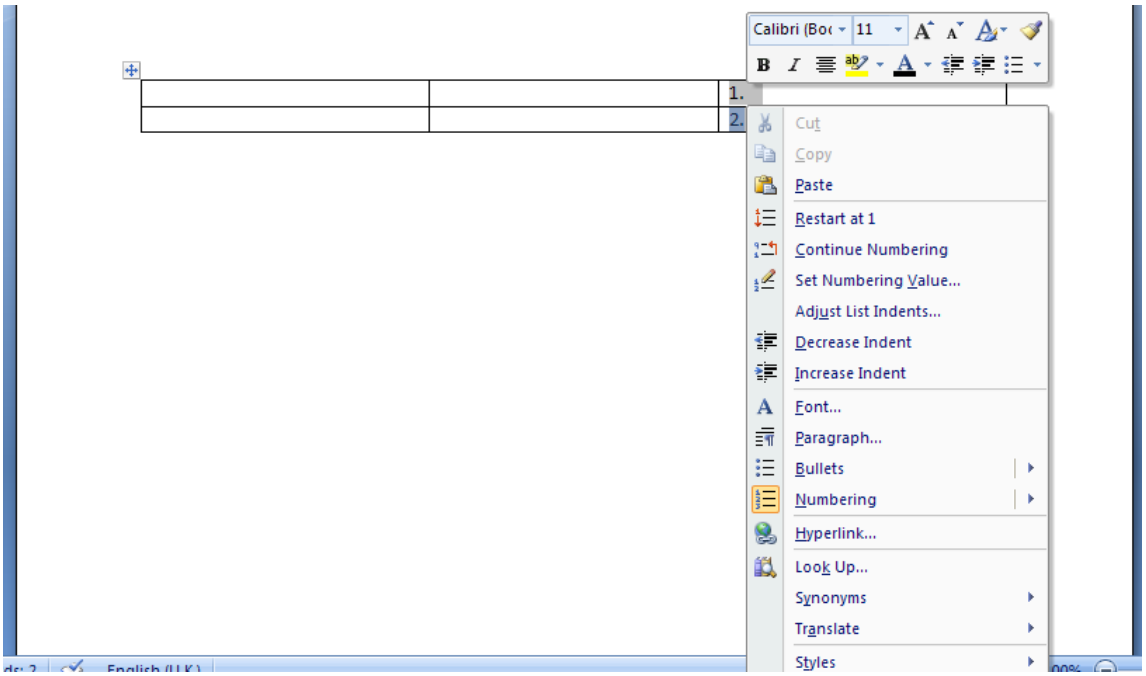
You can now add expressions to your table by clicking in the middle cell and using Equation or Alt+=. Extra rows can be added to a table in the usual way, for example by using the Tab key once the cursor is in the bottom right-hand cell.

	$\sqrt{a^2+b^2}$	(1.1)
	$f(x)=\begin{cases}-x, & x<0\\ x, & x\geq 0\end{cases}$	(1.2)
		(1.3)

Finally, you can save your table with its numbering system for reuse! Select the entire table, and follow the procedure described in the 'Saving expressions' section of this document. Note that if there is no 'placeholder' equation within your table, the relevant entry in the Equation Gallery will appear to be blank. However, on selecting it, the table – complete with built-in numbering – will be placed into your document.

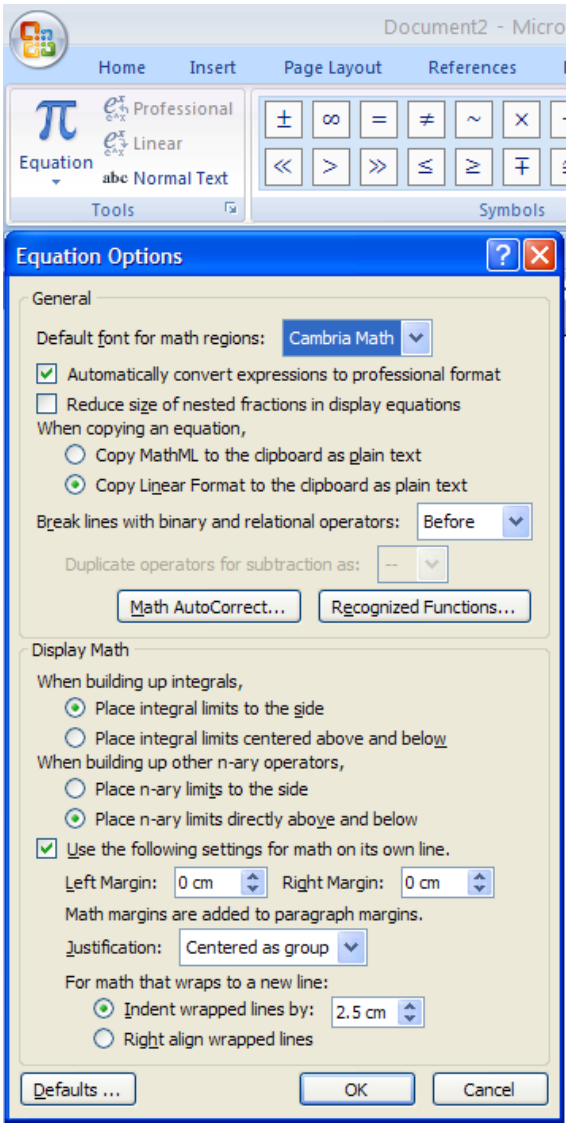


The usual facilities associated with a numbered list are available, such as being able to use continuous numbering throughout a document, or to restart the numbering at a certain point.



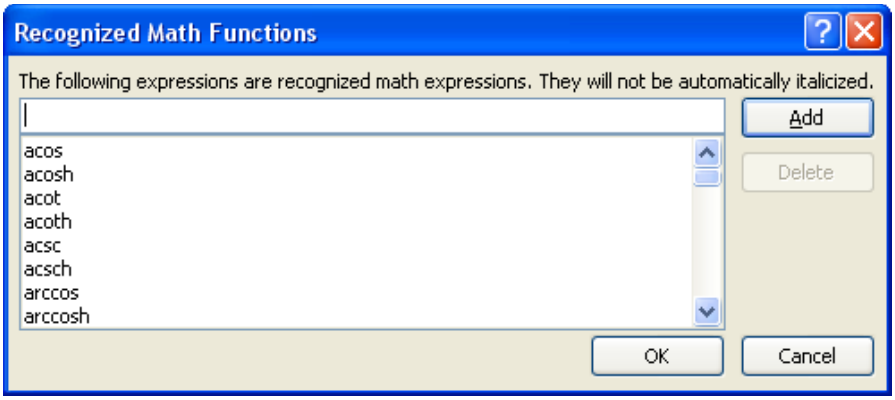
Settings for mathematical text

The default font for mathematical text is Cambria Math and, in the current versions of Word 2007, this cannot be changed. However, there are other aspects of mathematical text that may be altered. Use Alt+= to switch to mathematics mode, and the ribbon will automatically change to Equation Tools. Click on the small square box next to 'Tools', to access the **Equation Options** dialogue box.

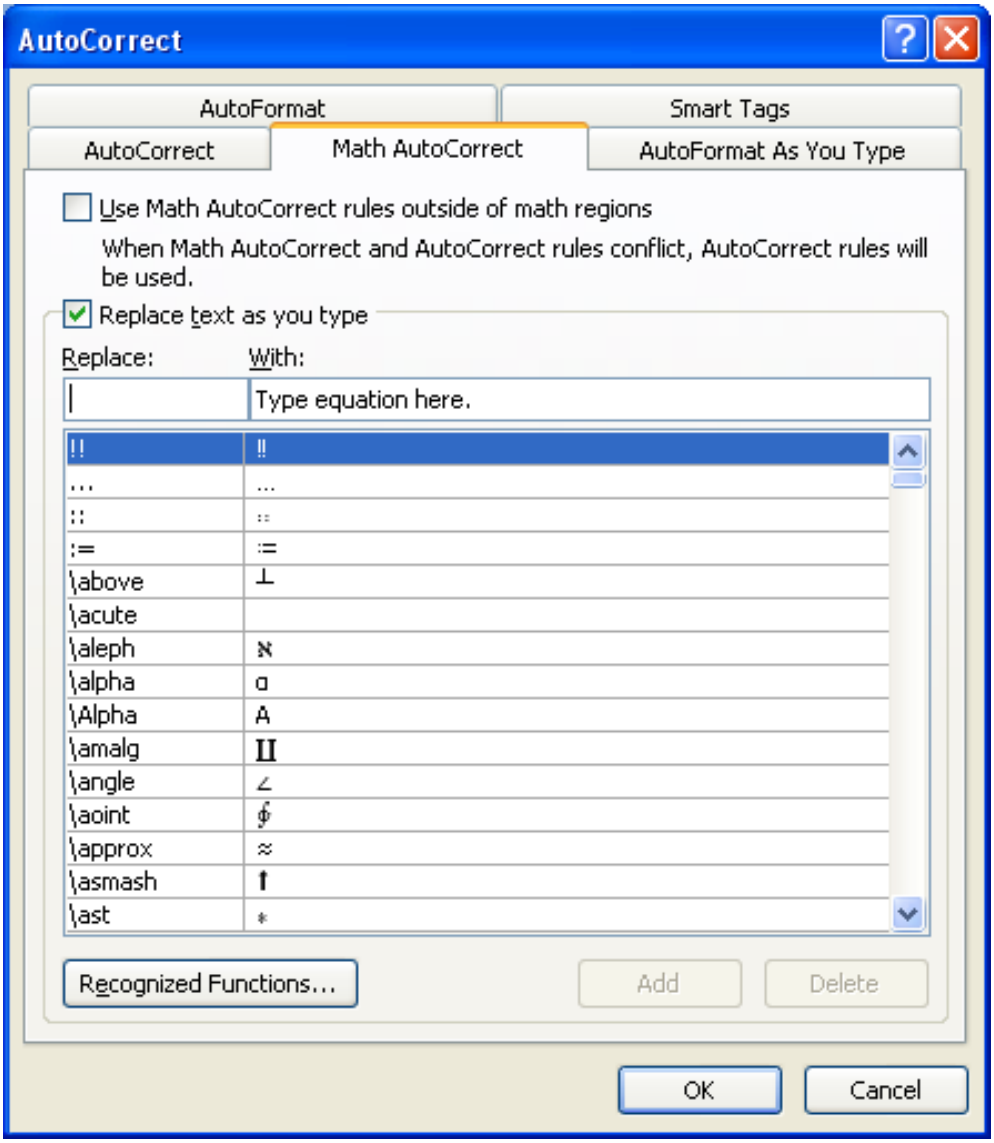


If you are likely to want to change any of the settings, they are probably self-explanatory!

The Recognized Functions button gives access to the list of text input codes, such as those listed in Appendix D, that Word 2007 will accept as mathematical expressions and not put into italics within a mathematical input box. Note that it is possible to add other recognised functions.



The Math AutoCorrect button gives access to the mathematics text input codes (the Unicodes) and their respective symbolic interpretations (the glyphs), as listed in Appendix E.



From here, among other things, it is possible to do the following.

- Change either the Unicode or the glyph for any particular input code/symbol.
- Switch on Math AutoCorrect to work outside of mathematical input boxes, i.e. to force the Unicodes to be interpreted as symbols (i.e. the glyphs) in all text.
- Change AutoCorrect settings for normal text.
- Change other AutoFormat settings.

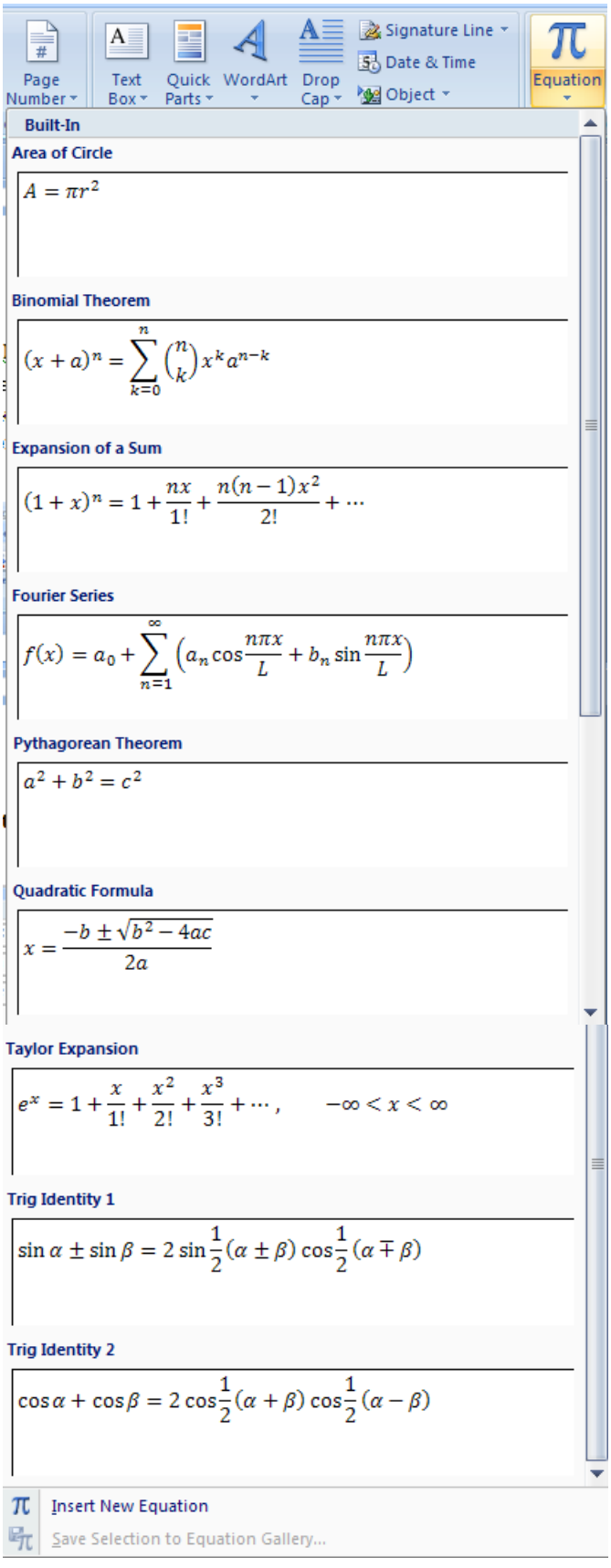
Related resources

At the time this guide was last updated (June 2009), it is possible to access a quick (under seven minute) tour through the Math functionality provided in Word 2007, with one of the key developers of the feature, Murray Sargent, on YouTube at http://www.youtube.com/watch?v=yyvJwNeUALY.

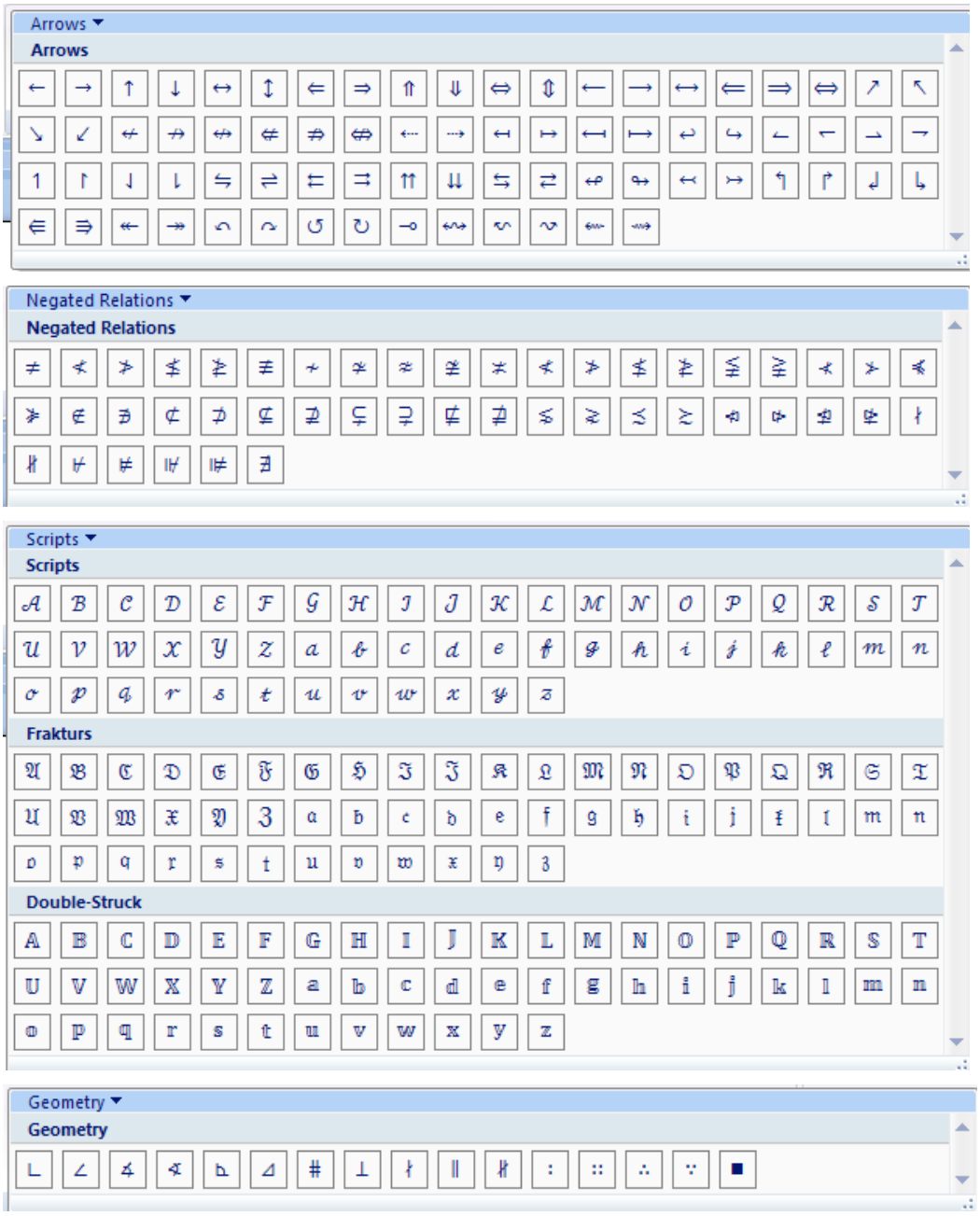
More details about maths and Word 2007 are available in Murray Sargent's blog at http://blogs.msdn.com/murrays.

Appendices

Appendix A: Built-in equations in the Equation Gallery



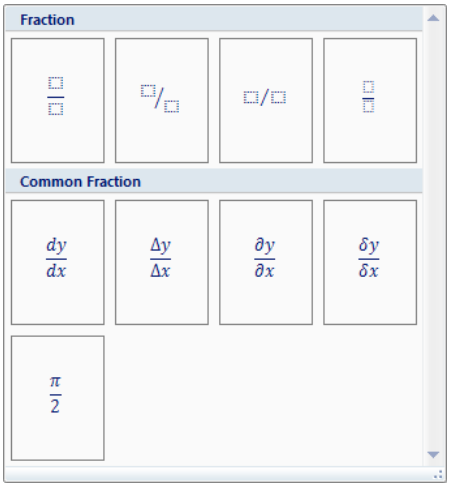
Appendix B: Symbol palettes


Arrows
Arrows
Negated Relations
Negated Relations
Scripts
Scripts
Frakturs
Double-Struck
Geometry
Geometry

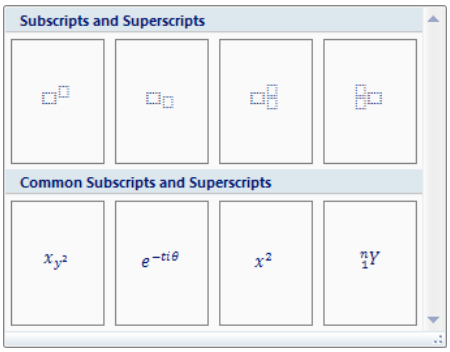
Appendix C: Structures palettes

Note that you will need to scroll to see all the options in some of the palettes.

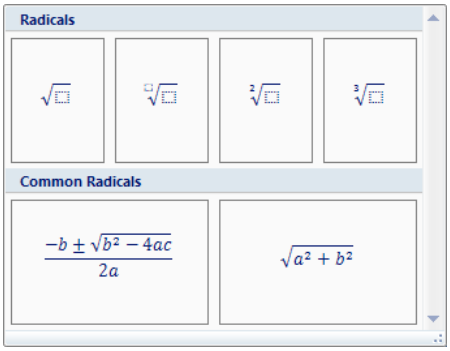
Fraction



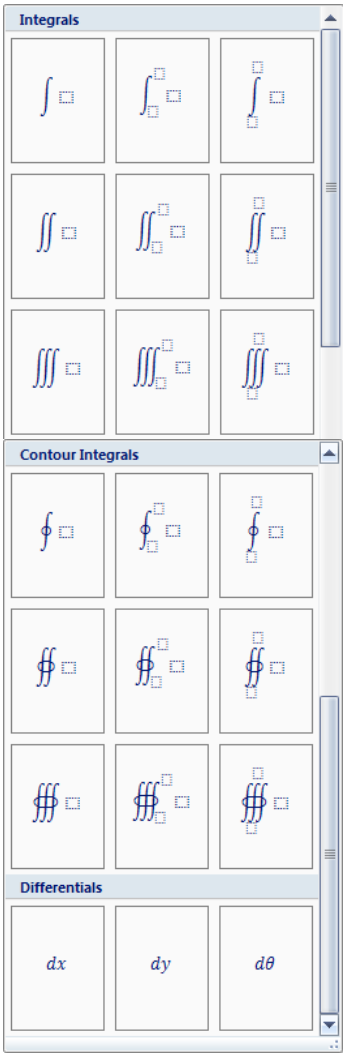
Script



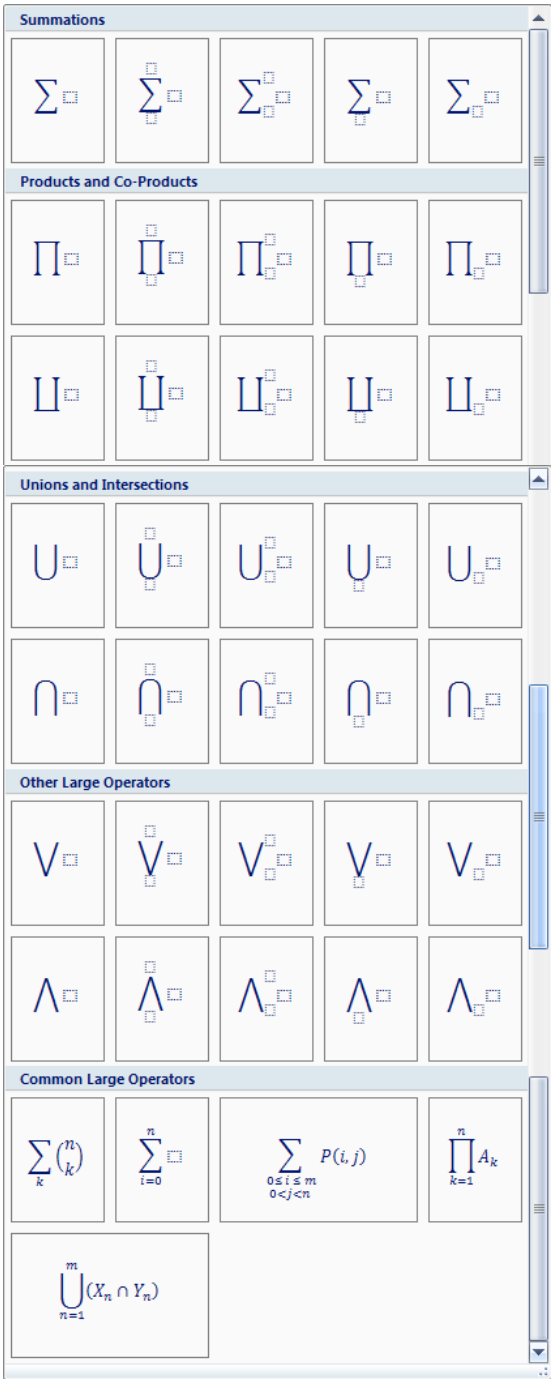
Radical



Integral

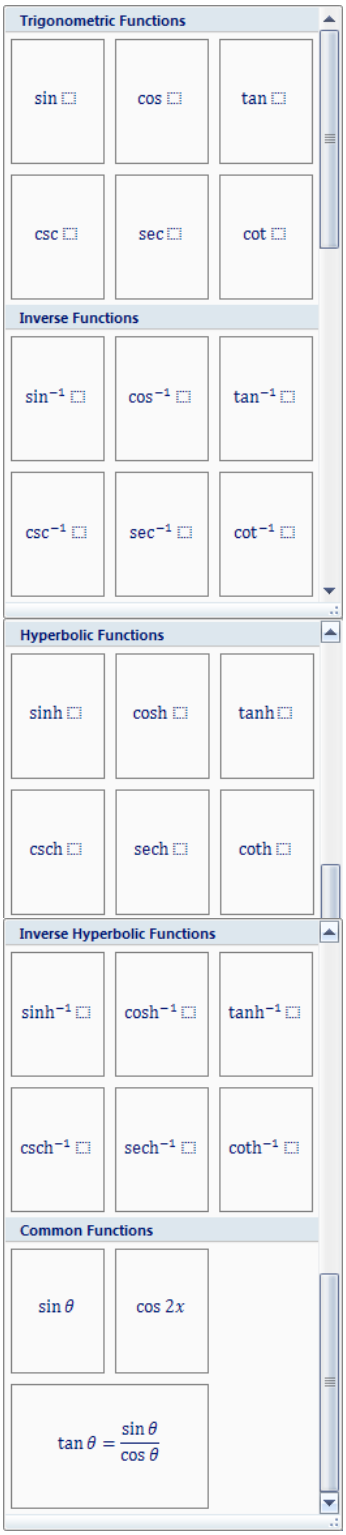


Large Operator

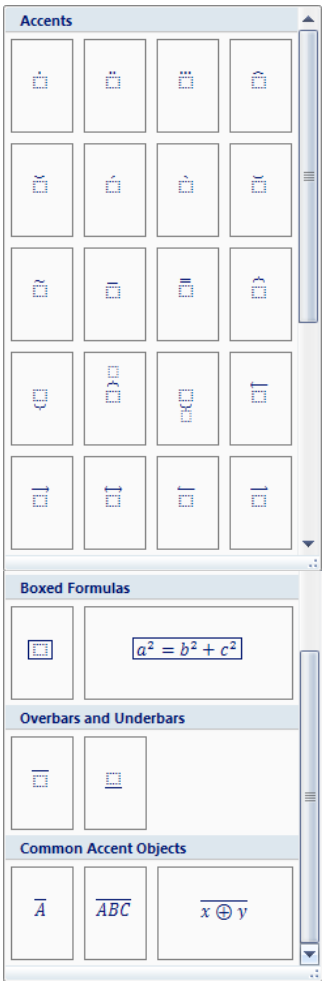


Bracket

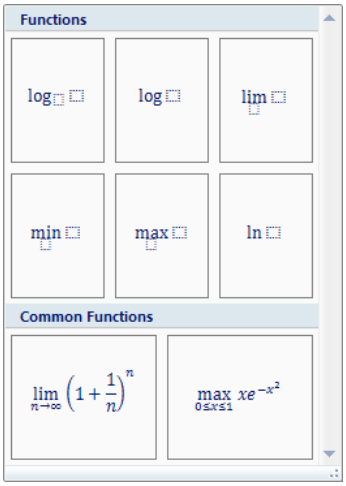
Function



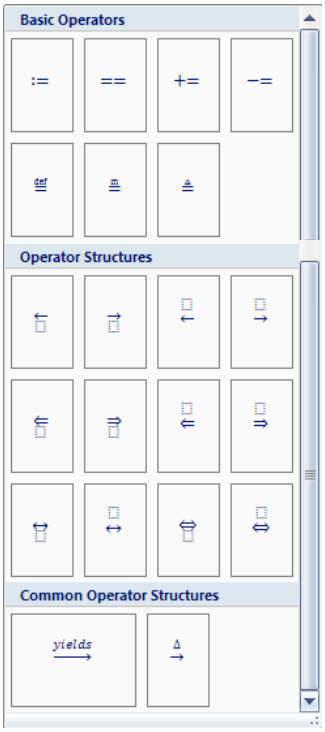
Accent



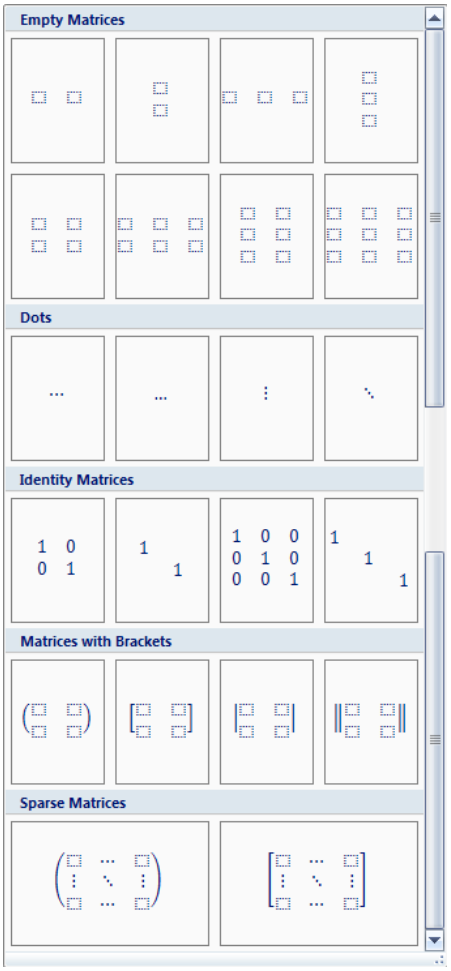
Limit and Log



Operator



Matrix



Appendix D: Text input codes for recognised functions

Word 2007 input code	*Built-up expression*
sin	$\sin\square$
cos	$\cos\square$
tan	$\tan\square$
sec	$\sec\square$
csc	$\csc\square$
cot	$\cot\square$
log	$\log\square$
log_10	$\log_{10}\square$
ln	$\ln\square$
exp	$\exp\square$
sinh	$\sinh\square$
cosh	$\cosh\square$
tanh	$\tanh\square$
sech	$\operatorname{sech}\square$
csch	$\operatorname{csch}\square$
coth	$\coth\square$
arcsin	$\arcsin\square$
arccos	$\arccos\square$
arctan	$\arctan\square$
lim	$\lim$
inf	$\inf\square$
sup	$\sup\square$
lim_sup	$\lim\sup\square$
lim_inf	$\lim\inf\square$
max	$\max\square$
min	$\min\square$
det	$\det\square$
deg	$\deg\square$
dim	$\dim\square$
arg	$\arg\square$
“normal text”	normal text

Appendix E: Mathematics text input codes

The codes are case-sensitive. Within Word 2007, these are known as Math AutoCorrect symbols. Most are also in the list accessed by searching for 'Math AutoCorrect' in Word Help [F1].

To get	Type
…	... [three dots]
′	' [quote mark]
±	+-
∓	-+
→	->
≤	<=
≥	>=
≪	<<
≫	>>
≅	~=
≔	:=
∷	::
‼	!!
́	\acute
ℵ	\aleph
α	\alpha
A	\Alpha
∐	\amalg
∠	\angle
∮	\aoint
≈	\approx
⬆	\asmash
∗	\ast
≍	\asymp
̄	\bar
̿	\Bar
∵	\because
ב	\bet
β	\beta
B	\Beta
⋂	\bigcap
⋃	\bigcup
⊙	\bigodot
⊕	\bigoplus
⊗	\bigotimes
⊔	\bigsqcup

To get	Type
⨄	\biguplus
⋁	\bigvee
⋀	\bigwedge
⋈	\bowtie
□	\box
⟨	\bra
̆	\breve
∙	\bullet
∩	\cap
∛	\cbrt
⋅	\cdot
⋯	\cdots
̌	\check
χ	\chi
X	\Chi
∘	\circ
♣	\clubsuit
∲	\coint
≅	\cong
∪	\cup
ℸ	\dalet
⋯⋯	\ddddot
⋯	\dddot
¨	\ddot
⋱	\ddots
°	\degree
δ	\delta
Δ	\Delta
⋄	\diamond
♢	\diamondsuit
÷	\div
̇	\dot
≐	\doteq
…	\dots
𝔸 (etc.)	\doubleA (etc.)
𝕒 (etc.)	\doublea (etc.)

To get	Type
↓	\downarrow
⇓	\Downarrow
⬇	\dsmash
ⅇ	\ee
ℓ	\ell
∅	\emptyset
ϵ	\epsilon
E	\Epsilon
≡	\equiv
η	\eta
H	\Eta
∃	\exists
∀	\forall
𝔄 (etc.)	\frakturA (etc.)
𝔞 (etc.)	\fraktura (etc.)
γ	\gamma
Γ	\Gamma
≥	\ge
≥	\geq
←	\gets
≫	\gg
ג	\gimel
̀	\grave
̂	\hat
ℏ	\hbar
♡	\heartsuit
↩	\hookleftarrow
↪	\hookrightarrow
⃗	\hvec
ⅈ	\ii
∭	\iiint
∬	\iint
ℑ	\Im
∈	\in
Δ	\inc
∞	\infty

To get	Type
$\int$	\int
ι	\iota
I	\Iota
$\jmath$	\jj
κ	\kappa
K	\Kappa
$\rangle$	\ket
λ	\lambda
Λ	\Lambda
$\langle$	\langle
$\{$	\lbrace
$[$	\lbrack
$\lceil$	\lceil
$/$	\ldivide
$\ldots$	\ldots
$\leq$	\le
$\leftarrow$	\leftarrow
$\Leftarrow$	\Leftarrow
$\leftharpoondown$	\leftharpoondown
$\leftharpoonup$	\leftharpoonup
$\leftrightarrow$	\leftrightarrow
$\Leftrightarrow$	\Leftrightarrow
$\leq$	\leq
$\lfloor$	\lfloor
$\ll$	\ll
$\mapsto$	\mapsto
$\mid$	\mid
$\models$	\models
$\mp$	\mp
μ	\mu
M	\Mu
∇	\nabla
$\neq$	\ne
$\nearrow$	\nearrow
$\neq$	\neq
$\ni$	\ni
$\|\|$	\norm
ν	\nu
N	\Nu

To get	Type
$\nwarrow$	\nwarrow
o	\o
O	\O
$\odot$	\odot
$\oiiint$	\oiiint
$\oiint$	\oiint
$\oint$	\oint
ω	\omega
Ω	\Omega
$\ominus$	\ominus
$\oplus$	\oplus
$\otimes$	\otimes
$/$	\over
$\overline{}$	\overbar
$\overbrace{}$	\overbrace
$\overparen{}$	\overparen
$\parallel$	\parallel
∂	\partial
ϕ	\phi
Φ	\Phi
π	\pi
Π	\Pi
$\pm$	\pm
$''''$	\pppprime
$'''$	\ppprime
$''$	\pprime
$\prec$	\prec
$\preccurlyeq$	\preceq
$'$	\prime
$\prod$	\prod
$\propto$	\propto
ψ	\psi
Ψ	\Psi
$\sqrt[4]{}$	\qdrt
$x=(-b\pm\sqrt{(b^2-4ac)})/2a$	**\quadratic**
$\rangle$	\rangle
$:$	\ratio
$\}$	\rbrace
$]$	\rbrack

To get	Type
$\rceil$	\rceil
$\iddots$	\rddots
$\Re$	\Re
$\square$	\rect
$\rfloor$	\rfloor
ρ	\rho
P	\Rho
$\rightarrow$	\rightarrow
$\Rightarrow$	\Rightarrow
$\rightharpoondown$	\rightharpoondown
$\rightharpoonup$	\rightharpoonup
$\mathcal{A}$ (etc.)	\scriptA (etc.)
a (etc.)	\scripta (etc.)
$/$	\sdivide
$\searrow$	\searrow
$\setminus$	\setminus
σ	\sigma
Σ	\Sigma
$\sim$	\sim
$\simeq$	\simeq
$\updownarrow$	\smash
$\spadesuit$	\spadesuit
$\sqcap$	\sqcap
$\sqcup$	\sqcup
$\sqrt{}$	\sqrt
$\sqsubseteq$	\sqsubseteq
$\sqsupseteq$	\sqsuperseteq
$\star$	\star
$\subset$	\subset
$\subseteq$	\subseteq
$\succ$	\succ
$\succcurlyeq$	\succeq
$\sum$	\sum
$\supset$	\superset
$\supseteq$	\superseteq
$\swarrow$	\swarrow
τ	\tau
T	\Tau
$\therefore$	\therefore

To get	Type
θ	\theta
Θ	\Theta
~	\tilde
×	\times
⊤	\top
↔	\tvec
‗	\ubar
‗	\Ubar
‗	\underbar
⏟	\underbrace
⏟	\underparen
↑	\uparrow
⇑	\Uparrow

To get	Type
↕	\updownarrow
⇕	\Updownarrow
⊎	\uplus
υ	\upsilon
Υ	\Upsilon
ε	\varepsilon
φ	\varphi
ϖ	\varpi
ϱ	\varrho
ς	\varsigma
ϑ	\vartheta
|	\vbar

To get	Type
⋮	\vdots
→	\vec
∨	\vee
|	\vert
‖	\Vert
∧	\wedge
℘	\wp
≀	\wr
ξ	\xi
Ξ	\Xi
ζ	\zeta
$\Zeta$	\Zeta

Appendix F: Text input of complex structures

Although palette input is recommended for complex structures, here are some examples of text input for several typical mathematical expressions.

Word 2007 input code	***Built-up expression***
\int_0^1 f(x) dx	$\int_0^1 f(x)dx$
(\matrix(1&0@0&1))	$\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$
lim_(n\to\infty) (1 +1/n)^n = e	$\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n = e$
(x)\dot = x [Note \dot is put in *after* the *x*.]	$\dot{x} = x$
((x)\dot)\dot = (x)\ddot	$\dot{\dot{x}} = \ddot{x}$
\underbar(r)	$\underline{r}$
\eqarray(2&x+&4&y=2@-2&x+&4&y=6)	$2x + 4y = 2$ $-2x + 4y = 6$
\sqrt(n&x+y)	$\sqrt[n]{x+y}$
1\ldiv 2 + 3\ldiv 4 = 5\ldiv 4	$1/2 + 3/4 = 5/4$