

Painless Math for Word

Dealing with Primary School Mathematics in Word Effectively

Goh Wei Zhong
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The author would like to remind readers that written computer instructions often seem more complicated than they really are, and that readers should not be put off by the seemingly long instructions below. They can actually be worked through very rapidly.

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Chapter 3, Working without Equation Editor, can be found in the **Supplement for Advanced Users**. It contains instructions on how to create time-saving keyboard shortcuts to virtually any character available on computers, and how to create fractions that look like those created by Equation Editor, without using Equation Editor itself.

Questions, comments and suggestions:
weizhong.goh@gmail.com

0 Notation

Ctrl + K: Holding the Control key, press **K**

Ctrl + K, T: Holding the Control key, press **K**, and **release both keys**. Then press **T**

Alt + 0: Holding the Control key, press **0 on the main keyboard**

Alt + Num 0: Holding the Control key, press **0 on the numeric keypad** (left of the screen)

Insert > Symbol... suggests clicking on **Insert** on the menu bar, and then clicking **Symbol...** on the **Insert** menu (Figure 1)



Figure 1 - **Insert > Symbol**

1 Using Word 2007

Do not use the new default interface for equation editing.

Why? Word 2007 includes a new default interface for editing equations in addition to Microsoft Equation Editor 3, which is the old equation editor shipped with Microsoft Office. The new interface generates equations that appear as graphics in older versions of Word; thus, equations made using this interface in Word 2007 cannot be edited in older versions of Word. (This happens even when the document is saved in a format compatible with earlier versions of Word.) Thus, when collaborating with users using older versions of Word (and for Project 2100), do not use the default interface.

To use Word 2007 for editing equations to be edited on older versions of Word, edit in Compatibility Mode **from the beginning** and use Equation Editor 3, and/or the methods outlined below for working without Equation Editor.

how Turning on Compatibility Mode

1. Open a new document
2. Click the Microsoft Office Button. Click **Save As**
3. In the **Save as type** list (bottom), select **Word 97–2003 Document**
4. Type a name for the document in the **File name** box (bottom)
5. Click **Save**
6. The default interface for equation editing will be inactive. Use the methods outlined below for equation editing

2 Working with Equation Editor

2.1 Strengths and limitations

Strengths

1. Can handle more complicated working (e.g., superscripts in fractions)
2. Character palette available for visual reference when entering characters
3. Brackets that expand as you insert fractions
4. Automatic alignment at “=”

Limitations

1. No keyboard shortcuts for very many symbols
2. Need to load up separate program
3. Formatting does not change with rest of document

2.2 Installation

To check if you have Equation Editor installed, **Insert > Object...**, click the **Create New** tab. In the **Object type** list, check for **Microsoft Equation 3.0**. Equation Editor is installed if and only if you see this on the list.

Installation could be done through **Add or Remove Programs** in **Control Panel**. Opt to “change” the Office XP installation in the relevant dialogues. In the component summary, expand **Office Tools** and select **Run from My Computer** for **Equation Editor** (Figure 2). You may need your installation CD for this procedure.



Figure 2 - Installing Equation Editor through Setup

2.3 Shortcuts to equation editor

Huh? What follows are instructions on how to create a keyboard shortcut and a mouse shortcut to Equation Editor. You only need to do one of the following, depending on whether you like using the keyboard or the mouse more. The keyboard offers a slight speed advantage over the mouse.

how Creating a keyboard shortcut to Equation Editor

1. **T**ools > **C**ustomize...
2. Click **K**eyboard... (near the bottom, beside **C**lose)
3. Under **S**pecify a command, under **C**ategories (top left), select **I**nsert
4. Highlight any option under **C**ommands (top right)
5. Type **INSERTEQ** (quickly) to locate **I**nsert**E**quation
6. In **P**ress **n**ew shortcut key (middle), press your desired keyboard shortcut (recommended: **Alt + E**)
7. Ensure that it is not assigned to some other command (i.e., **[Unassigned]** appears below the field for your desired keyboard shortcut)
8. Click **A**ssign, then **C**lose, then **C**lose

how Creating a mouse shortcut to Equation Editor

1. **T**ools > **C**ustomize...
2. Click the **C**ommands tab
3. Under **C**ategories (left), select **I**nsert
4. Under **C**ommands (right), scroll down to locate **E**quation **E**ditor. It is located 2/3 way down the menu
5. Drag it to somewhere conspicuous on any of the toolbars (e.g., beside the "Undo" button)

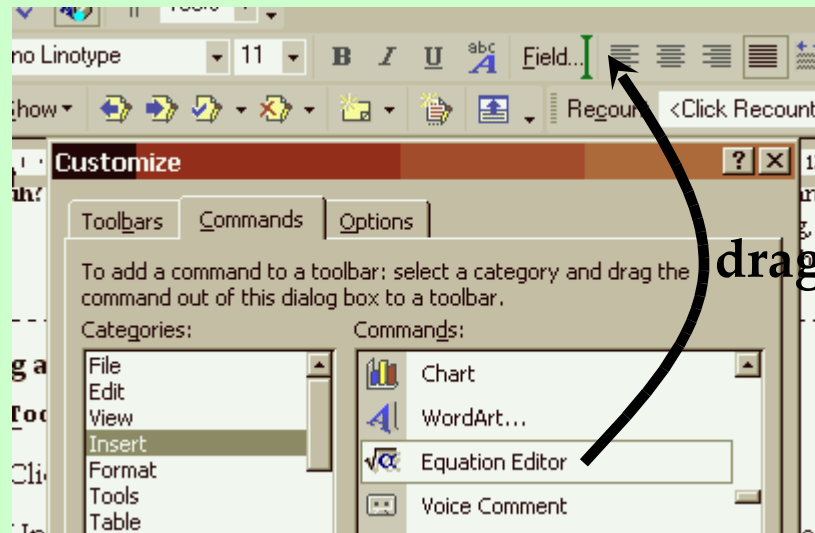


Figure 3 - Dragging an icon to the toolbar

6. Click **Close**

2.4 Symbols

Symbol	Pre-installed shortcut	Symbol	Pre-installed shortcut
General		Geometry	
–	- (hyphen)	π	Ctrl + G, P
\times	Ctrl + K, T	$^{\circ}$	None
\div	None	Δ	None
\approx	None	\angle	None
\rightarrow	Ctrl + K, A		

The shortcuts are pre-installed.

All of the signs can be entered by accessing the toolbar palettes. The toolbar is available from **View > Toolbar**. The respective locations of the symbols are shown in Figure 4.

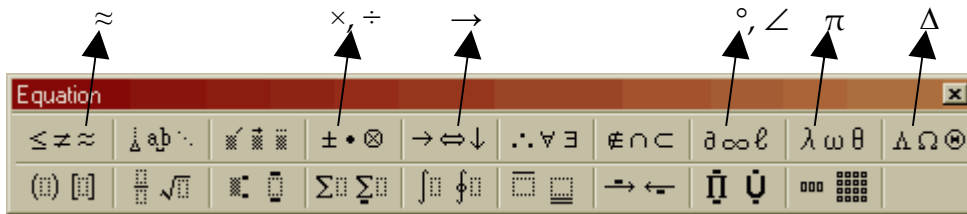


Figure 4 - Location of various symbols on toolbar palettes

2.5 Expanding brackets, superscripts, fractions

Function	Shortcut key	When nothing is selected	When something is selected
Expanding brackets (These brackets expand in size when such elements as fractions are within the placeholder)	Ctrl + 9 or Ctrl + 0 : Brackets Ctrl + [or Ctrl +] : Square brackets Shift + Ctrl + [or Shift + Ctrl +] : Braces	Inserts expanding brackets with a placeholder between the brackets	Encloses the expression within expanding brackets
Superscript	Ctrl + H <i>H</i> is for <i>high</i>	Inserts a placeholder for superscripted text	Places expression in a placeholder for superscripted text
Fractions	Ctrl + F	Inserts a fraction, with placeholders for numerator and denominator	Inserts a fraction, with the numerator as the selected expression and a placeholder for the denominator

Tip For the above commands, **Shift + Ctrl + letter** does *not* do the reverse of **Ctrl + letter**; to take text out of a placeholder, copy the text within the placeholder and paste it outside.

Using the mouse

In place of using the keyboard shortcuts above, you can use the mouse to select an item from the toolbar palettes. The respective locations of the functions are shown in Figure 5. Selecting an item from the palettes performs exactly the same function as using the corresponding keyboard shortcut above.

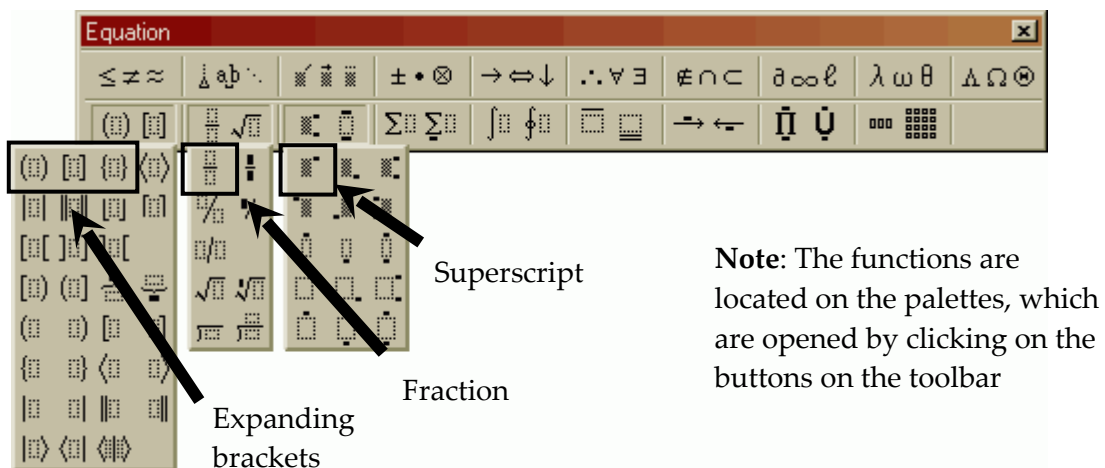


Figure 5 - Locations of various functions on toolbar palettes

eg

Using Equation Editor to input expressions

$$\begin{aligned} &\text{Input } \left(\frac{5}{3}\right)^2 \times \times \$200 \\ &= \times \$200 \\ &= 5 \times \$100 \\ &= \$500 \end{aligned}$$

Solution.

1. Press **Alt + E**, or press the Equation Editor button on the toolbars, to load Equation Editor
2. Press **Ctrl + 9** or **Ctrl + 0** for expanding brackets, then **Ctrl + F** for fraction. Press **5**, **down**, **3** to complete the fraction. Press **Tab** twice to exit both the fraction placeholder and the brackets placeholder
3. Press **Ctrl + H** for superscript placeholder, and press **2**. Press **Tab** to exit the superscript placeholder
4. Press **Ctrl + K, T** for the multiplication symbol
5. Press **Ctrl + F, 9, down, 1, 0** for the second fraction, and press **Tab** to exit
6. Repeat Step 4. Type **\$200**
7. Press **Enter, =**
8. Press **Ctrl + F, 5, down, 2** for the third fraction, and press **Tab** to exit
9. Repeat Step 6
10. Press **Enter, =, 5, Ctrl + K, T**. Type **\$100**. Press **Enter**. Type **= \$500**
11. Click anywhere outside the equation to exit Equation Editor

2.6 Alignment of working

We can align working at equal signs by **Format > Align at** \equiv when the cursor is anywhere in a multi-line equation.

Tip For this option to be enabled, the equation itself must span multiple lines.

Tip This option might sometimes fail to be activated after being selected. In such cases, save the document, restart Microsoft Word and try again.

2.7 Inputting text

By default, Equation Editor treats all alphabet input as variables; it italicises input text and disallows the use of the spacebar. To enter spaces using the spacebar or to enter text in roman type, enter Text Mode by pressing **Shift + Ctrl + E**. Return to Normal (Math) Mode by pressing **Shift + Ctrl + =**.

Tip The default mode is Math Mode. When you enter Text Mode, the mode is carried over lines and into placeholders you insert. However, once you exit a placeholder, Math Mode is restored, and you have to press **Shift + Ctrl + E** again should you want to re-enter Text Mode. (The example below will illustrate this.)

Text can also be highlighted and either shortcuts pressed to render the selected text in that mode. For example, italicised text that is selected when **Shift + Ctrl + E** is pressed would be converted into roman type.

eg Inputting formulae in Roman type and aligning working

Type

$$\begin{aligned} \text{speed} &= \frac{\text{distance}}{\text{time}} \\ &= \frac{300}{5} \\ &= 60 \text{ km/h} \end{aligned}$$

Solution.

1. Press **Alt + E**, or press the Equation Editor button on the toolbars, to load Equation Editor
2. Press **Shift + Ctrl + E** to enter Text Mode
3. Type **speed=** (Note that a space is automatically inserted between **speed** and **=** in the equation)
4. Press **Ctrl + F** for fraction. Since Text Mode is carried over into placeholders you create, there is no need to press **Shift + Ctrl + E** to enter Text Mode again. Type **distance**, press **Down**, and type **time** to complete the fraction. Press **Tab** to exit the fraction
5. Press **Enter**, and begin the second line by typing **=**

6. To create the second fraction, press **Ctrl + F**. Type 300, press **Down**, and type 5. Press **Tab** to exit the fraction
7. Press **Enter**, and type =60
8. Press **Shift + Ctrl + E** to enter Text Mode. (Note that Math Mode was restored once you exited the distance/time fraction. Also note that you must enter Text Mode before typing the space as spacebar spaces are not allowed in Math Mode)
9. Press **Space**, and type km/h
10. **Format** > **Align at** \equiv
11. Click anywhere outside the equation to exit Equation Editor

References

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Copyright information

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References and author contact information can be found in the main document.

3 Working without Equation Editor

3.1 Strengths and Limitations

Strengths

1. Keyboard shortcuts available for most symbols
2. Formatting changes with the rest of the document
3. No need to load up separate program

Limitations

1. No expanding brackets
2. Need to remember keyboard shortcuts for symbols

3. Cannot handle complicated working (e.g., superscripts in fractions)

3.2 Symbols

how Creating keyboard shortcuts for special characters

1. **I**nset > **S**ymbol...
2. Click the **S**ymbols tab
3. Select **Unicode (hex)** from the **f**rom field (bottom right)
4. Select the character you want to create the shortcut for in the palette of characters, or type its character code in the **C**harter code field. For example, to create a shortcut for the multiplication sign, locate the multiplication sign from the palette of characters, or type its character code, **00D7**, in the **C**harter code field (Figure 6)

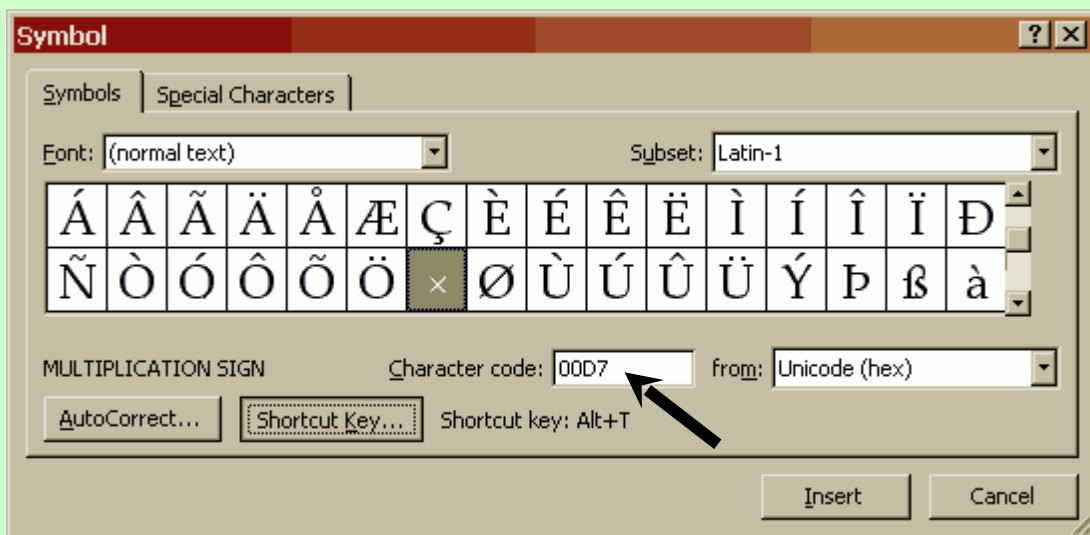


Figure 6 - Locating a character by typing its character code

5. Click **S**hortcut **K**ey... (bottom left)
6. In the new dialogue that pops up, in the **P**ress **n**ew shortcut **k**ey... field, press your desired shortcut key (e.g., **Alt + T**)
7. Ensure the desired shortcut key is not assigned to some other command (Figure 7)

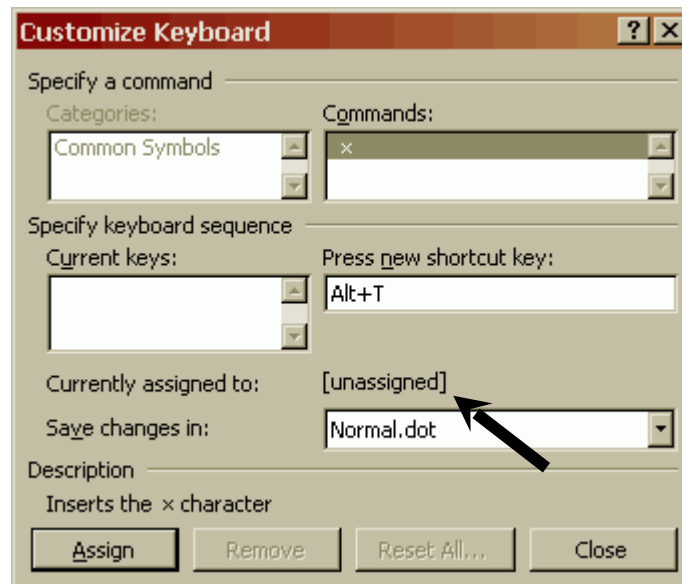


Figure 7 - Ensure that desired shortcut key is unassigned

8. Click **A**ssign, then **C**lose to close the Customise Keyboard dialogue
9. Repeat Steps 4–8 for the other characters that you may need to enter
10. Click **c**lose to close the Symbol dialogue

Suggested keyboard shortcuts for symbols

Symbol	Suggested shortcut	Character code	Symbol	Suggested shortcut	Character code
General			Geometry		
–	Alt + Num +	2212	π	Alt + P	03C0
×	Alt + T	00D7	°	Alt + O	00B0
÷	Alt + D	00F7	Δ	Alt + 3	2206
≈	Alt + =	2248	\angle	Alt + A	Symbol: 208
→	Alt + .	2192			

By default, the keyboard shortcuts suggested above are not already assigned to some other command

eg Using keyboard shortcuts for special characters

Type $5 \times 5\pi = 25\pi$.

Solution. Key in 5, space, Alt + T, space, 5, Alt + P, space, =, space, 2, 5, Alt + P.

3.3 Superscript

To key in superscripted text, press **Ctrl + Shift + =**. Enter the text. Press **Ctrl + Shift + =** again to enter baseline text again.

Or **Format > Font** (or press **Ctrl + D**), select the **Font** tab and, under effects, check **Superscript**.

To superscript text that has already been entered, select the text, and press **Ctrl + Shift + =**. Press **Ctrl + Shift + =** again to revert the text back to baseline text.

Or Select the text to be superscripted, **Format > Font** (or press **Ctrl + D**), select the **Font** tab and, under effects, check **Superscript**.

eg Entering superscripted text

Type $5^2 = 25$.

Solution. Key in **5, Ctrl + Shift + =, 2, Ctrl + Shift + =, space, =, space, 2, 5**.

Alternative solution. Key in **5, 2, space, =, space, 2, 5**. Select **2** and press **Ctrl + Shift + =**.

3.4 Inserting variables

Variables in typed mathematical expressions need to be italicised (**Ctrl + I**).

eg Entering variables

Type $x + 3x = 4x$.

Solution. Key in **Ctrl + I, x, Ctrl + I, space, +, space, 3, Ctrl + I, x, Ctrl + I, space, =, space, 4, Ctrl + I, x, Ctrl + I**.

Alternative solution. Key in **x + 3x = 4x**. Select the **xs** and press **Ctrl + I**.

3.5 Equation field (Fractions, etc.)

Huh? What follows are instructions on how to create a keyboard shortcut and a mouse shortcut to Insert field. You only need to do one of the following, depending on whether you like using the keyboard or the mouse more. The keyboard offers a slight speed advantage over the mouse.

how Creating a keyboard shortcut to Insert field

11. Follow instructions on Page 6 of the main guide, "Creating a keyboard shortcut to Equation Editor"
12. For Step 5, instead of typing **INSERTEQ**, type **INSERTF** to locate **InsertField**
13. The recommended shortcut is **Alt + F**

how Creating a mouse shortcut to Insert field

14. Follow instructions on Page 6 of the main guide, "Creating a mouse shortcut to Equation Editor"
15. For Step 4, instead of locating **Equation Editor**, locate **Field...**

how Inserting a fraction through Insert field

16. Press **Alt + F** or click the **Field...** button that you've just created on the toolbars
17. Click **Formula...** (right)
18. Under **F**ormula (top), remove the = and type **EQ**
\f (numerator, denominator), where numerator and denominator represent the numbers above and below the fraction respectively
19. Press **Enter**

Tip Any text entered will appear in roman type. To italicise the text, highlight the field after entering the fraction and press **Ctrl + I**.

Tip Be careful not to type **EQ \f(1/2)** when you mean to type **EQ \f(1,2)** (the separator is a comma, not a slash)

Tip Expressions can be boxed up by enclosing them with **\x(and)**

eg Using Insert field to input fractions

Use Insert field to type = 50% and box the equation up.

Solution. Press **Alt + F**, click **Formula...**, press **Backspace**, type **EQ \x(\f(1,2) = 50%)** and press **Enter**

3.6 Alignment of working

Centralise working by pressing **Ctrl + E** when the cursor is anywhere within the paragraph to be centralised. Alternatively, select the paragraphs to be centralised and press **Ctrl + E**.

Working can also be aligned with a hanging indent. The keyboard shortcut is **Ctrl + T**; use it like **Ctrl + E** above. Press **Ctrl + T** to increase the indent and **Shift + Ctrl + T** to decrease the indent. Press **Tab** to align a part of the first line with the indent of the remaining lines.

Huh? A hanging indent refers to indent where all the lines in a paragraph from the second line onwards are indented to the right relative to the first line. A hanging indent has been applied to this paragraph.

eg Using keyboard shortcuts to apply hanging indent to working

Use keyboard shortcuts to align the equal signs in the following working:

Money that John has at the start = $\times \times \$200$
= $\times \$200$
= $5 \times \$100$
= $\$500$

Solution. Click anywhere within the paragraph containing the working and press **Ctrl + T**

Money that John has at the start = $\times \times \$200$
= $\times \$200$
= $5 \times \$100$
= $\$500$

1. Press **Ctrl + T** again to increase the indent:

Money that John has at the start = $\times \times \$200$
= $\times \$200$
= $5 \times \$100$
= $\$500$

2. Press **Ctrl + T** a few more times so that the position of the first equal sign is to the left of the subsequent equal signs

Money that John has at the start #= $\times \times \$200$
= $\times \$200$
= $5 \times \$100$
= $\$500$

and press **Tab** after placing the mouse at the position of the # above. Press **Space** a few times before *Money* to make the text closer to the equal sign.

Money that John has at the start = $\times \times \$200$
= $\times \$200$
= $5 \times \$100$
= $\$500$

