Microsoft Word Lab: Equation Editor

Table of Contents

Introduction

(Information) Pythagoras' equation $z^2 = x^2 + y^2$ is cumbersome to enter using the normal Microsoft Word font format dialog box to place the power in the superscript position, but it can be done. The variety of equations possible are limited.

$$a = b + c$$

Equation 1

An equation editor is needed to gain access to the large symbol library and special formatting needed for general purpose mathematics. For example, the following equation is impossible to enter using just text entry with a word processor.

Equation 2

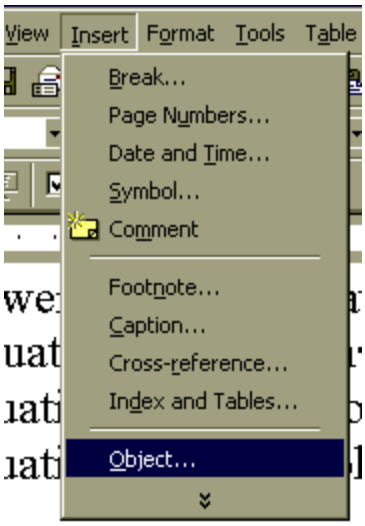
$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$$

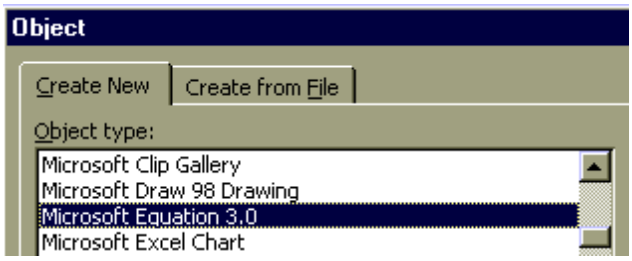
The Microsoft Equation Editor provides a useful method for documenting equations in a Microsoft Word document, an Excel spreadsheet, a PowerPoint presentation, or as an OLE object saved in an Access database. In Word, Excel, and PowerPoint, the equation is visible. In Access, the data cell contains the entry, "Microsoft Equation 3.0". When the cell is clicked, the equation editor opens and displays the equation. The equation is static; it is not linked to a computer algebra system. It is like an equation in a textbook.

The Microsoft Equation Editor is satisfactory for a few equations. If you need to prepare a document with a lot of equations, you should not be using Microsoft Word or Corel WordPerfect. You should be using Scientific Word (http://www.tcisoft.com) or Ami Pro which have equation editors created for this purpose.

Inserting Equations

(Information) Entering an equation is easy. Position the insert cursor to the location where the equation is to be placed. On the "Insert" menu, select "Object…". In the "Object" dialog box, select "Microsoft Equation".





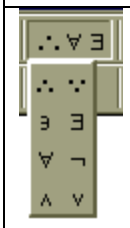
An equation edit box  will open at the position of the insert cursor and will display an equation toolbar.

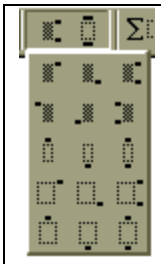
Each panel in the toolbar is a button.

- Each button on the top row opens a menu of related symbols.
- Each button on the lower row opens a menu of templates.

A template provides a space to insert a symbol or another template. The insert locations are shown as small dotted boxes.

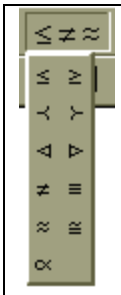
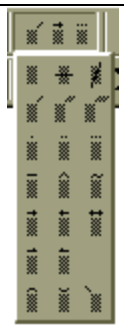
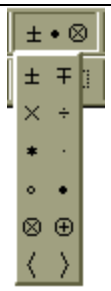
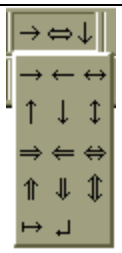
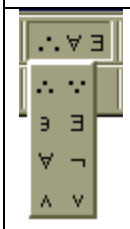
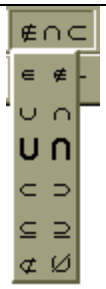
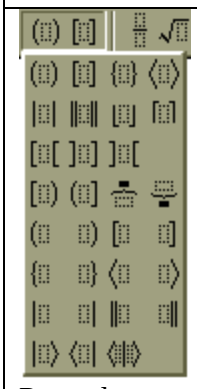
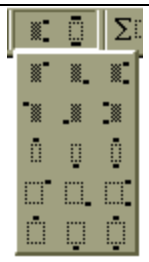
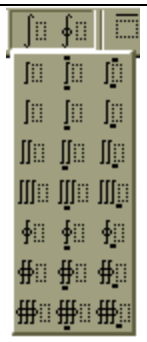
- Click in the box to position the insert cursor, and make desired entries.
- Use the arrow navigation keys to move between box positions.

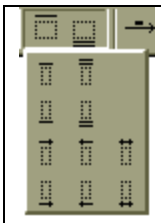
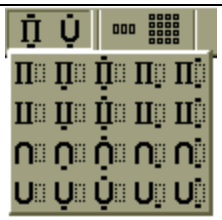
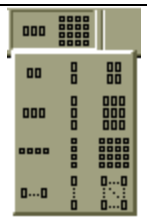
Menu	Button	Example	Remarks
		∃	Used for predicate logic. These symbols are used in mathematics and logic, including in philosophy!

			Used to apply a superscript and subscript to a symbol.

Equation Toolbar Menus

(Information) The below table illustrates the symbols associated with each menu on the equation toolbar.

 Relations	 Thin Spaces Ellipses	 Embellishments	 Binary Operators	 Arrows
 Logic	 Set Relations and Operators	 Miscellaneous	 Lower Case Greek Letters	 Upper Case Greek Letters
 Parentheses	 Fractions Radicals	 Subscripts Superscripts	 Summation	 Integrals

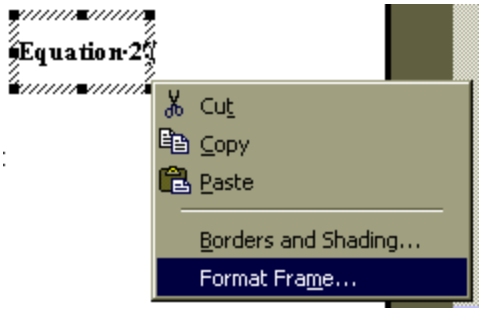
 Underbars Overbars	 Labeled Arrows	 Set Operators	 Matrix Templates	

Equation Numbers and Location

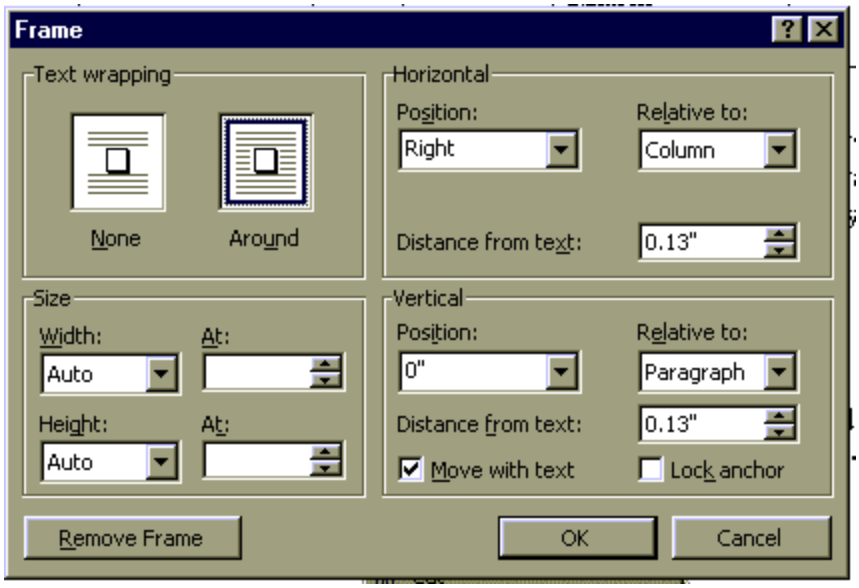
(Information) An equation can be automatically numbered, and the equation number can be referenced elsewhere. The equation number is encapsulated in a frame. The frame can be located to the right or to the left of the equation. The position is determined by the style format.

$$4\int_0^{p/2}\left(\frac{ds}{dq}\right)dq = 4b\int_0^{p/2}\sqrt{1-k^2\sin^2 q}\quad dq \qquad \textbf{Equation 3}$$

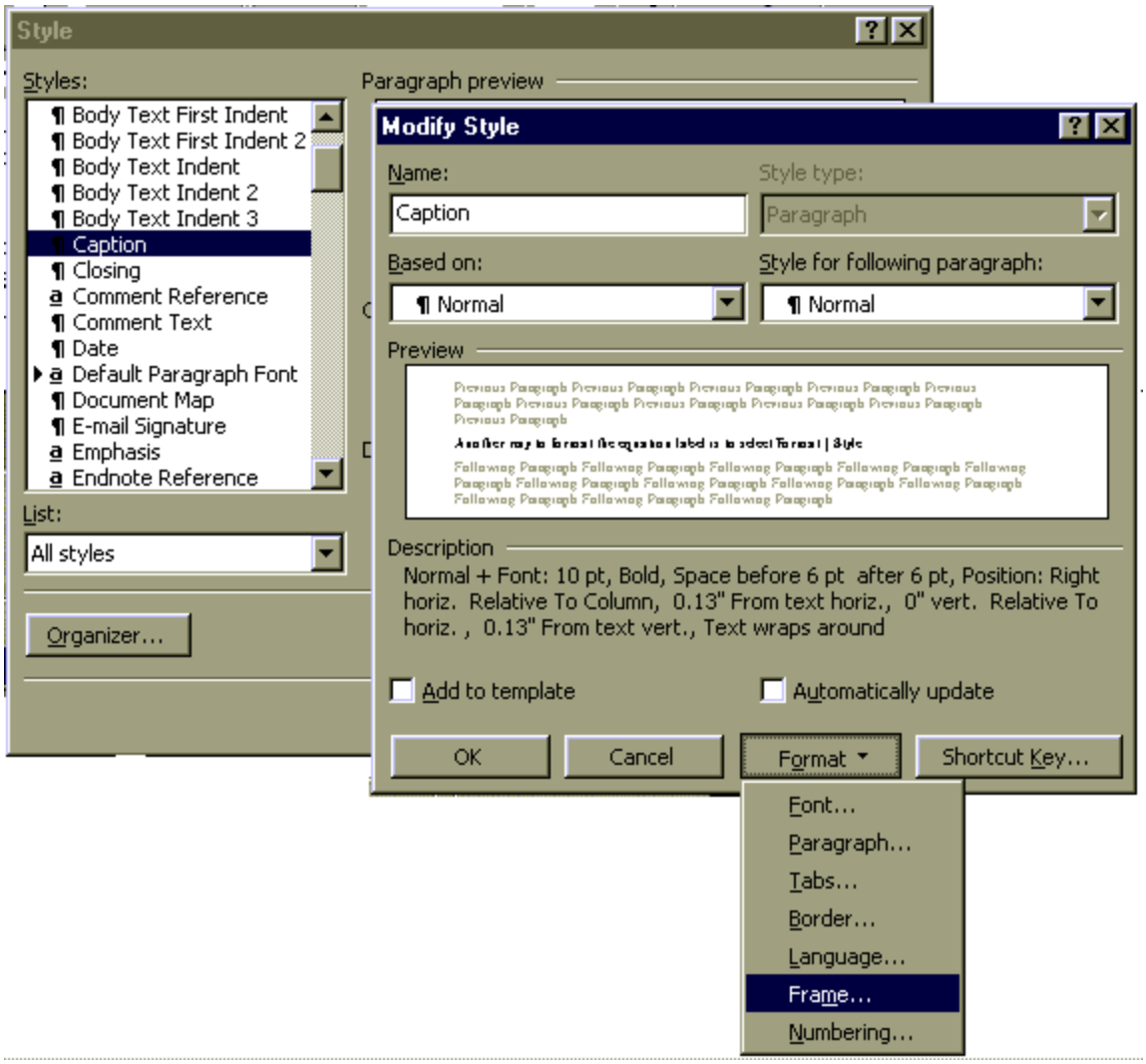
To change the position, click on the equation label. The label will be enclosed by a rectangle with a striped boarder. Right-click on the border to obtain the Frame context-sensitive menu. Select “Format Frame” on the context sensitive menu.



In the “Position” selection box of the “Horizontal” section, choose the location of the equation label.

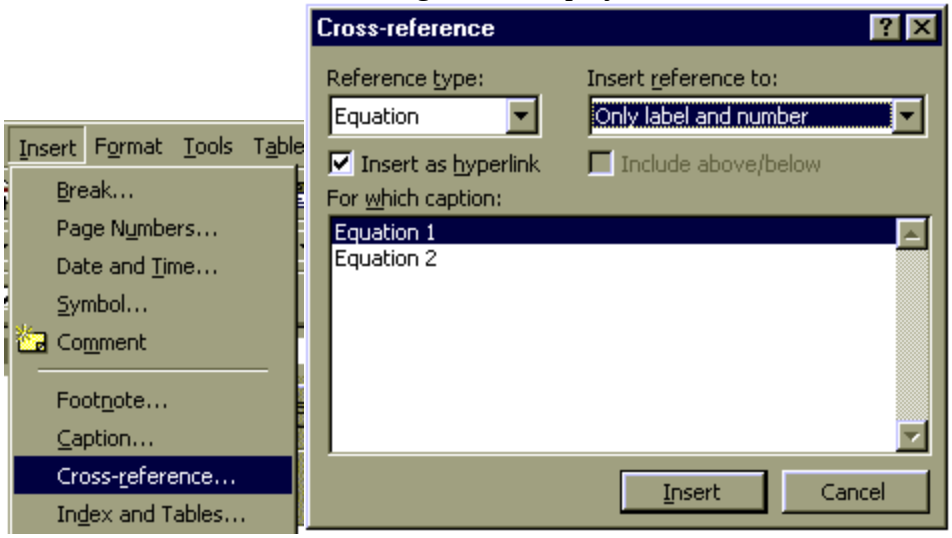


Another way to format the equation label is to select Format | Style



Referencing an Equation

(Information) Use the "Insert | Cross-reference" menu to reference an equation. This causes the Cross-reference dialog box to display.



Select "Equation" from the "Reference type" drop-down list. Select "Only label and number" from the "Insert reference to" drop-down list. The "caption" is the equation itself. You probably do not want that choice. Select the equation number from "For which caption" section. For example, to reference the series expansion for e^x, these instructions produce a reference to **Error! Reference source not found.**. The equation number is automatically supplied.

Renumbering Equations

(Information) If you insert another equation before this one, and renumber the equations, this equation number will be updated. To renumber equations:

- Edit | Select All
- Press function key F9.

This causes all equation objects entered with Microsoft Equation Editor to be renumbered.

Lab Assignment

(Procedure)

1. Start a new Word document.
2. Create a custom header.
    a. Enter your name in the left section.
    b. Enter "Equation Lab" at the center tab.
    c. Enter the current date in the right section.
3. On separate lines, enter the following equations with equation numbers.
    a. $\sin^2(q+\Omega)+\cos^2(q+\Omega)=1$ **Equation 4**

        1. Start Microsoft Equation Editor.
        Insert | Object | Create New | Microsoft Equation 3.0

2. In the insert box of Equation Editor, type **sin**.

$\sin$

Equation 5

3. In row 2, column 3 of the Equation Toolbar, select the Superscript Palate.
4. In the Superscript Palate, select the superscript template in row 1, column 1. The superscript template will appear with the insert cursor positioned in the superscript edit box.
5. Type 2 into the superscript edit box.
6. Advance the insert cursor to the next baseline position by pressing the right navigation arrow on the keyboard.

$\sin^2$

Equation 6

7. In row 2, column 1 of the Equation Toolbar, select the Parentheses Palate.
8. In the Parentheses Palate, select the pair of round parentheses in row 1, column 1. The pair of round parentheses template will appear with the insert cursor positioned inside the parentheses.

$\sin^2(\ )$

Equation 7

9. In row 1, column 9 of the Equation Toolbar, select the Greek Characters (lower case) Palate.
10. In the Greek Characters (lower case) Palate, select the lower case Greek Theta θ in row 5, column 2. The lower case Greek Theta will appear with the insert cursor positioned inside the parentheses immediately to the right of the lower case Greek Theta.

$\sin^2(\theta)$

Equation 8

11. Type a plus sign +.

$\sin^2(\theta+)$

Equation 9

12. In row 1, column 10 of the Equation Toolbar, select the Greek Characters (upper case) Palate.
13. In the Greek Characters (upper case) Palate, select the upper case Greek Omega Ω in row 6, column 1. The upper case Greek Omega will appear with the insert cursor positioned inside the parentheses immediately to the right of the upper case Greek Omega.

$\sin^2(\theta+\Omega)$

Equation 10

14. Use the right navigation arrow on the keyboard to move the insert cursor outside of the pair of parentheses. After one push, the insert cursor should be immediately to the right of the right parenthesis.
15. Type a plus sign +.

$\sin^2(\theta+\Omega)+$

Equation 11

16. Repeat the above procedure to insert the **cos** term, producing

$$\sin^2(\theta+\Omega)+\cos^2(\theta+\Omega)$$ **Equation 12**

17. Type **=1**.
18. Exit the Equation Editor by clicking outside of the equation edit box. The finished equation should look like

$$\sin^2(\theta+\Omega)+\cos^2(\theta+\Omega)=1$$ **Equation 13**

b. $$\frac{d}{dx}\left(\frac{u}{v}\right)=\frac{v\frac{du}{dx}-u\frac{dv}{dx}}{v^2}$$ **Equation 14**

c. $$\int u\,dv = uv - \int v\,du$$ **Equation 15**

In the last equation, insert a thin space between **u** and **dv** in the left side of the equation, and insert a space between **v** and **du** in the right side of the equation.

4. After the third equation, insert a reference to the third equation, using the label and number: "Look at _____. This equation is important. It is called integration by parts."

Your output should look like the next page (but starting with equation 1), with your own name in the header.

$$\sin^2(\theta + \Omega) + \cos^2(\theta + \Omega) = 1$$ **Equation 16**

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$$ **Equation 17**

$$\int u\, dv = uv - \int v\, du$$ **Equation 18**

Look at Equation 18. This equation is important. It is called integration by parts.