EQUATION EDITOR

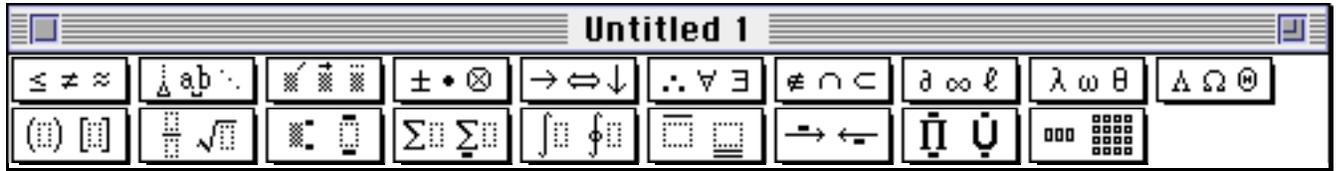## A mathematical typesetting program for Macintosh & PC computers.

Equation Editor is bundled with Microsoft Word and is therefore protected by licensing agreements and copyright statutes. Unauthorized duplication is prohibited.

EQUATION EDITOR

Overview

When you first open Equation Editor, you will see a window like this:

The two rows of boxes, called "palettes," under the title bar are actually pull-down menus. Here you will find the symbols (top row) and templates (bottom row) that you will use to build the mathematical expressions that you want. (In addition, there are regular pull-down menus (ones with word titles) across the very top of the screen. However, you will probably not have to use many of these for the kinds of things you will be doing.)

A "template" is a pre-formatted collection of symbols and empty slots. For example, one of the templates you can choose is the base and exponent template—the exponent slot is all superscripted and reduced in size. You build expressions by first inserting templates and then filling in their slots. When you first insert a template, the insertion point moves to the slot you are most likely to fill in first. To get to the next slot in the template, press the Tab key.

To insert a template, pull down one of the template palettes, drag the pointer over the template you want, and when it is highlighted, release the mouse button. For example, to insert a regular fraction, pull down the Fraction and Radical palette and release the mouse button when the fraction template is highlighted (as shown below).
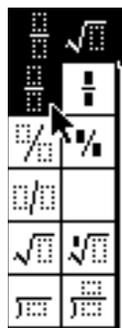
In the window you should then see the following:

Note the blinking insertion bar in the numerator. After typing in the numerator, press the Tab key and the blinking insertion point moves to the denominator. After typing in the denominator, press the Tab key again and the insertion point moves to the right of the entire fraction.

The Insertion Point

Probably the most important thing to understand about Equation Editor is the insertion point (the blinking vertical bar). When you type something from the keyboard, it is inserted wherever that bar is blinking. You can move the insertion point either by pressing the Tab key or by pointing and clicking somewhere else in the expression.

Below are a few examples of different locations for the insertion point and the result you get if you type the letter *y* while the insertion point is in each location.

$$\frac{2}{3x^2} \qquad \frac{2}{3x^2} \qquad \frac{2}{3x^2} \qquad \frac{2}{3x^2} \qquad \frac{2}{3x^2}$$

$$\Downarrow \qquad\quad \Downarrow \qquad\quad \Downarrow \qquad\quad \Downarrow \qquad\quad \Downarrow$$

$$\frac{2y}{3x^2} \qquad \frac{2}{3yx^2} \qquad \frac{2}{3x^{2y}} \qquad \frac{2}{3x^2y} \qquad \frac{2}{3x^2}y$$

If you choose to move the insertion point by pointing and clicking, it is sometimes helpful to magnify your view of what you are doing. Pull down the View menu (at the very top edge of the screen) and select either 200% or 400%. Note: This only changes your view of the expression, not the actual size.

Spaces

In general, pressing the Space Bar on the keyboard does nothing except make the computer beep at you. Equation Editor automatically adjusts the spacing for you depending on what symbols you use. In those special cases where you want to add more space between one symbol and the next, you can insert spaces of five different widths by using the Spaces and Ellipses palette, as shown below.

Symbol	Size Space	Keyboard Shortcut	
		Macintosh	**PC**
ab	Zero space	Shift + Space Bar	Shift + Space Bar
ab	1-point space ($\frac{1}{72}''$)	Command + Option + Space Bar	Ctrl + Alt + Space Bar
a b	Thin space (one-sixth em)	Command + Space Bar	Ctrl + Space Bar
a b	Thick space (one-third em)	Command + Shift + Space Bar	Ctrl + Shift + Space Bar
a b	Em space	No keyboard shortcuts	No keyboard shortcuts

Note: an "em" space is the width of the lower case letter "m" in whatever font and size is currently in use.

Types of Templates

There are essentially three different kinds of templates, represented in the palettes by three different kinds of boxes, as described below.

Box Type	What it means	Example	Result
Dotted Border Box	Used to indicate a normal template, one with various slots to be filled in.	(normal fraction)	$\dfrac{2}{3}$
Solid Black Box	Used to indicate a reduced size version of the template, but still with slots to be filled in.	(small fraction)	$\frac{2}{3}$
Gray Box	Used to indicate an attachment (such as a superscript) or an embellishment (such as a prime). This does not create a slot for the base character—you must create that before using this (or use the dotted border version of the template to create a slot for both the base and the attachment).	(superscript attachment)	^{5}

Fences & Other Templates That "Grow"

Things that surround an expression, such as parentheses and braces, are called "fences." There is an entire palette filled with various combinations of fences. When you use these templates, they "grow" with the expression they surround; whereas if you use the same symbols directly from the keyboard, they do not grow.

For example, if you use the parentheses on the keyboard to surround a fraction, this is what you get:	$(\frac{2}{3})$
If on the other hand, you use the parentheses template, this is what you get:	$\left(\frac{2}{3}\right)$

Most other templates (radicals, fraction bars, etc.) also grow to suit the size of the expression. Typesetting conventions dictate that summations (Σ), integrals ($\int$), products ($\prod$), etc., do not grow as the expression increases in height. However, you can override this for the summation only by holding down the Shift key as you select a summation template, as shown below.

Summation template chosen in the usual way	Summation template chosen while holding down the Shift key
$\int_{1}^{2} \frac{x^3}{x+1}\, dx$	$\int_{1}^{2} \frac{x^3}{x+1}\, dx$

Keyboard Shortcuts

Since there are certain operations you will probably do repeatedly, it is worth your while to learn how to do these things by using keyboard shortcuts rather than by pulling down menus and palettes. The ones for menu commands appear right on the menu next to the item. For example, if you pull down the File menu, you will see "⌘**A**" on a Mac or "Ctrl A" on a PC next to the Select All command. This means that if you hold down the Command key on a Mac (indicated by the ⌘ symbol) or the Control key on a PC and then press the letter A, you will "select all" of the expression. A list of the other most commonly used keyboard shortcuts in Equation Editor follows:

To insert	Template	Press	
		Macintosh	**PC**
(⬚)	Parentheses	Command + 9 or Command + 0	Ctrl + 9 or Ctrl + 0
[⬚]	Brackets	Command + [or Command +]	Ctrl + [or Ctrl +]
{⬚}	Braces	Command + { or Command + }	Ctrl + { or Ctrl + }
⬚	Fraction	Command + F	Ctrl + F
√⬚	Square Root	Command + R	Ctrl + R
⬚	Superscript	Command + H	Ctrl + H
⬚	Subscript	Command + L	Ctrl + L
⬚	Prime	Command + Option + Apostrophe	Ctrl + Alt + Apostrophe
⬚	Double Prime	Command + Shift + Apostrophe	Ctrl + Shift + Apostrophe

Nudging

Nudging allows you to exercise fine control over the placement of items in an expression. To nudge part of an expression you must first select it. Selection is done by holding down the mouse button and dragging the cursor over the items you want to nudge. You can tell that an item is selected because it is highlighted. Selection is not always an easy process in Equation Editor—it takes some practice and fine hand-eye coordination. Once selected, the selected items can be moved left, right, up, or down in increments of one pixel (screen dot at the current resolution) at a time. The nudge commands are not on any menu. Instead you must use the following key combinations:

To nudge the selection	Press	
	Macintosh	**PC**
Left 1 pixel	Command + Left Arrow	Ctrl + Left Arrow
Right 1 pixel	Command + Right Arrow	Ctrl + Right Arrow
Up 1 pixel	Command + Up Arrow	Ctrl + Up Arrow
Down 1 pixel	Command + Down Arrow	Ctrl + Down Arrow

Help

There is an extensive Help screen available at all times. Simply pull down the Help menu to "Contents." Once it appears, it should be self-explanatory. There you will find much of the same information presented here, plus a whole lot more!

Deleting

The Delete key works in the usual way, with one notable exception. When the cursor is flashing, pressing the Delete key will delete the character to the immediate left of the flashing cursor, but *only* in that slot (i.e., that part of the template). To remove other parts, you must move the insertion point by clicking there.

To delete an entire expression, such as when you are done with it and want to start a new one, select the entire expression (Select All on the Edit menu) and then press the delete key.

Getting Expressions into your Documents

To place your "equation" in Word, simply click on the close box. Equation Editor will quit, and your equation will automatically be placed in your Word document at the current location of the insertion point.

EQUATION EDITOR

Here are just a few of the different "equations" you can prepare using Equation Editor:

1. $y = 3x^2 - 7x + 5$

2. $\sqrt{1234}$

3. $\dfrac{5}{\sqrt[5]{3x + y}}$

4.
$$3x^2 - 5x = 2$$
$$3x^2 - 5x - 2 = 0$$
$$(3x + 1)(x - 2) = 0$$

5. $\dfrac{\dfrac{x^2}{6}}{\dfrac{5x}{4} - \dfrac{x^3}{8}}$

6. $\left[4x^3 + \left(\dfrac{7}{12x^2} \right)^3 \right]^2$

7. $x = \dfrac{3 \pm \sqrt{4}}{5}$

8. $x \in \left\{ \frac{2}{3}, 5, 7 \right\} \cap \left\{ \frac{3}{4}, 4\frac{1}{2}, 5 \right\}$

9. $\cos^2 \left(2x - \frac{3\pi}{4} \right)$

10. $\det A = \begin{vmatrix} -5 & 4 \\ 3 & 7 \end{vmatrix}$