❑ Document Window

Fixed Margin (use *File/Page Layout...* to adjust)

untitled 1

Movable Right Margin Marker

First Line Paragraph Indent   Ruler

Movable Left Margin Marker   Tab Well and Justification Selection (see *Tabs and Rulers* below)
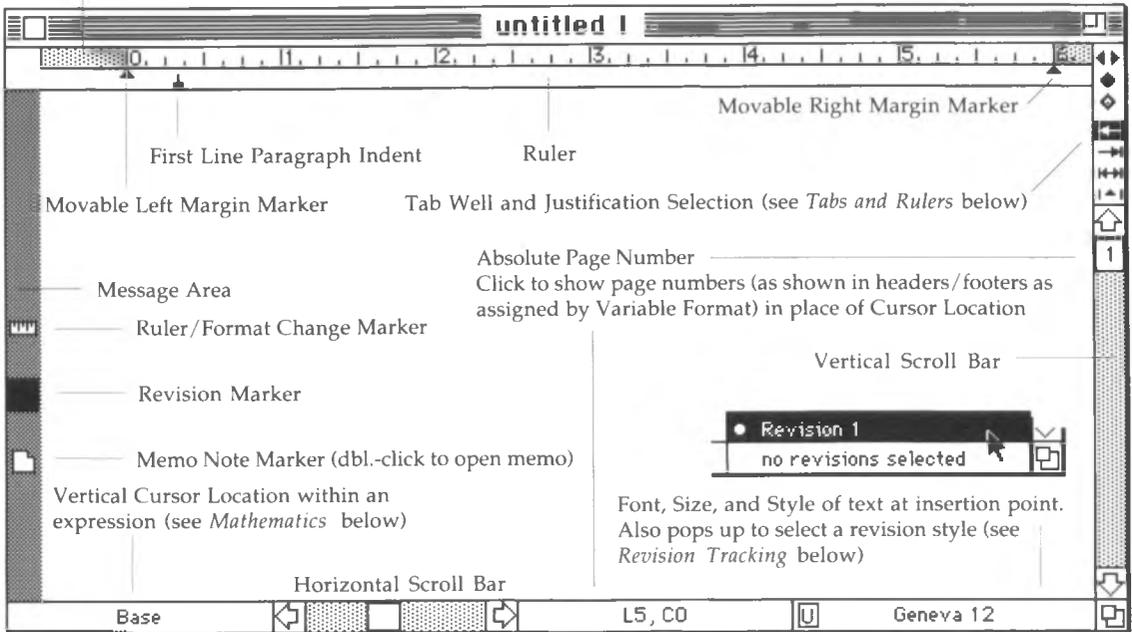
Absolute Page Number
Click to show page numbers (as shown in headers/footers as assigned by Variable Format) in place of Cursor Location

Message Area

Ruler/Format Change Marker

Vertical Scroll Bar

Revision Marker

• Revision 1
no revisions selected

Memo Note Marker (dbl.-click to open memo)

Vertical Cursor Location within an
expression (see *Mathematics* below)

Font, Size, and Style of text at insertion point.
Also pops up to select a revision style (see
Revision Tracking below)

Horizontal Scroll Bar

| Base | | L5, CO | U | Geneva 12 |

Thin black line indicates memory used.
Thin gray line indicates memory which
could be obtained if needed.

Cursor Location in Lines and Characters,
with menu which pops up to allow quick
movement to another area of your document
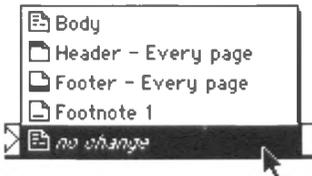
Symbols in boxes indicate the style that the
cursor is in.

U User Style (*Style/User Styles...*)

1 Style 1

2 Style 2

– Deleted Style (Revision Tracking)

+ Added Style (Revision Tracking)

Use *File/Preferences...* to define

📄 Body
📄 Header – Every page
📄 Footer – Every page
📄 Footnote 1
📄 *no change*
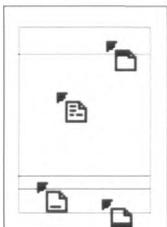
📄 Body   You can also enter other areas of your document by clicking into them. The cursor
📄 Header   changes to signal the area change.
📄 Footer
📄 Footnote

❑ Floating Windows

MathWriter has several other windows available from the *Windows* menu that extend its capabilities beyond "traditional" word processing. These are known as floating windows because they always remain in front of the document. They can be positioned anywhere on the screen. Use *File/Preferences...* if you wish to configure the set of windows you want to open when the program starts up, as well as their locations on the screen.

▲ Tools Window
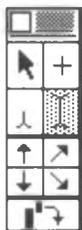
The top four icons select the four editors, which are also available from the Windows/Tools hierarchical menu. Note that the placement of command-shift key equivalents shown at the right is similar to the placement of the tool icons.
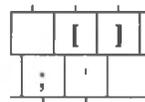
The bottom portion of the window will change depending on which tool is selected. The items shown here are discussed in the section *Mathematics* below.

Text Editor This is the "traditional" editor that allows you to move around in the text using the mouse or the keyboard arrow keys. Built-up mathematical expressions such as x^2 or $\sum_{i=1}^{100}$ are treated as one character.

Math Editor This editor allows you to enter, edit, and select portions of mathematical expressions. The position within the expression is indicated in the lower-left status box of the document window, which is discussed in the section *Mathematics*. You can also use the *option* key to toggle between this editor and the Text Editor.

Character Editor The purpose of this editor is to modify a single character or symbol in the following ways: (1) replace a symbol by selecting it and entering its replacement, such as truck to trick, α^2 to β^2, $\prod_{i=1}^{100}$ to $\prod_{i=1}^{100}$; (2) move a symbol vertically by dragging it with the mouse or clicking in the up or down arrows in the bottom portion of the tools window as shown on the right (the × in the center resets the symbol to its standard position); (3) crop or scale a picture (see the section *Working with Graphics*); (4) stretch brackets and integrals arbitrary amounts by holding down the option key and pulling the top or bottom of the symbol, or clicking in the center of the symbol to reset it to its standard size.

Sidebar Editor Used for creating, removing, and modifying sidebars and background pictures (see *Sidebars* below)

▲ Font Table Window

The Font Table provides convenient visual access to all characters of all fonts available to the system. The pop-up menu at the upper left of the window allows you to select the font that you want to display. Clicking on a character in the table inserts it into the document at the insertion point.

▲ Palettes Window

The Palettes Window is actually a window representation of the Palettes menu plus the Greek alphabet. Rows of symbols can be added to or removed from the window by selecting the row name in the Palettes menu.

▲ Templates Window

This window contains a set of mathematical constructs that can be entered into your document. You can: (1) click in a template set icon and drag horizontally similar to the way a menu in the menu bar works; or (2) hold down the *command* (⌘) key and type the number corresponding to the vertical position of the icon starting at one and ending at 0.
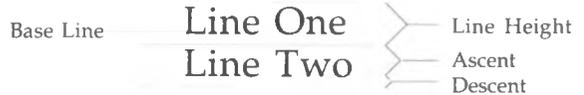

Click…   and Drag, or…   Type ⌘-4 and 2

▲ Library Window

See description of *Library* below.

❏ Line Spacing

Use *Format/Line Spacing…* to set line spacing. The Line Height is the sum of the ascent and descent of the line, which are computed differently for each of the three line spacing formats as follows:

Automatic   Ascent and Descent are the maximum ascent and descent of each symbol on the line.

$$\text{Mix of Symbols } \sum_i^\infty \text{ and } siz\mathbf{e}s.$$

**Fixed**   Ascent and Descent are set in the dialog box and aren't affected by the heights of the symbols on the line. Note that this may cause characters to intrude into other lines.

$$\text{Mix of Symbols } \sum_i^\infty \text{ and } siz\mathbf{e}s.$$

Mostly Fixed   This is a combination of Automatic and Fixed. Fixed is used if the line contains just text or inline mathematical structures. If there is a displayed expression or a variable such as an equation number, then the spacing switches to automatic.
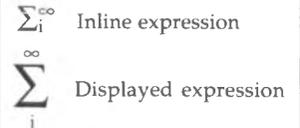
❏ Tabs and Rulers

The ruler area at the top of the screen displays the ruler associated with the current paragraph. If more than one paragraph is selected, the ruler shows the format of the first ruler in the selection.

◀ ▶	
Right align	Left align
◆	
Center align	
◇	
Decimal (Character) align	

▲ To Add a Tab

Drag a tab from the tab well into the ruler.

▲ To Remove a Tab

Drag a tab from the ruler to the right of the right margin marker ▲.

▲ To Change a Tab and Set Tab Leaders

Double click the tab. The dialog box allows you to: (a) change a tab; (b) set the alignment character for the Decimal (Character) tab; (c) select tab leaders.

▲ Fixed Tabs

Double click in the ruler. The resulting dialog allows you to use tab markers as just described or to put tabs at fixed units along the ruler.

|	
Left Align	
Right Align	
Left-Right Align	
Center	
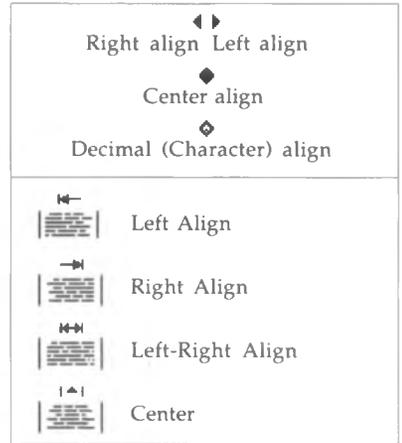
❏ Mathematics

▲ Structure of a Mathematical Construct

A mathematical construct consists of a symbol with one or more dependent symbols arranged in the proper positions. With the Text Editor selected, this group of symbols is considered to be one symbol, which is calculated to be the smallest rectangle surrounding the group of symbols. The Math Editor allows you to edit within the construct. The location of the cursor within a construct is indicated in the box at the lower left of the screen as shown in the section *Document Window*. The word Base indicates that you are editing normal text and are not within an expression. A series of arrows shows the "path" of the cursor, e.g., if you were editing the two under the square root symbol above, the path would be $\uparrow \downarrow$ because you are superscripted once and subscripted once. A matrix or table additionally gives the row and column number.

$$\frac{\sqrt{2}}{2}$$
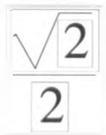
▲ Creating a Mathematical Construct

For any symbol, a sub-expression can be created using the Tools Window, a portion of which is shown at the right. The command key equivalents are the same as explained in the section *Tools Window* except that the Shift key is not used. Note that using Template constructs automatically invoke the proper super/subscript commands. Press the *enter* key (or

Centered Above ↑	↗ Above and to the Right
↓ Centered Below	↘ Below and to the Right

equivalently ⌘ *return*) to return the cursor one level back toward the baseline. Pressing the return key alone while in a construct returns all the way back to the baseline in one step.
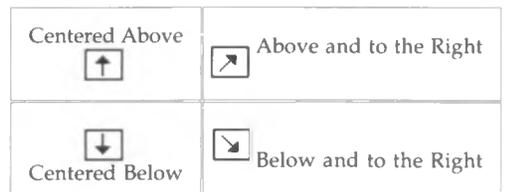
▲ Editing Within a Matrix or Table

Special key commands let you edit within a matrix or table:

return	Move to next row, creating it if necessary.
tab	Move to next column, creating it if necessary.
⌘ *shift [arrow keys]*	Move between cells without creating new cells.
enter	Leave matrix and return to baseline.

❏ Revision Tracking

This feature uses distinctive "styles" to display proposed additions and deletions and places black markers in the margins.

▲ To Define Revision Styles

Define revision styles under *File/Doc Preferences....* More than one style can be defined, allowing for multiple sets of revisions in a single document.

▲ To Enable Revision Tracking

Use File/Doc Preferences... or type ⌘ *option R.* Brackets around the current font indicate that revision tracking has been turned on.

| Geneva 12 |

▲ To Remove Revisions

Revisions can be either revised or unrevised. "Revised" means that text designated as added text will have its added text style removed and text designated as deleted text will be removed. "Unrevised" means just the opposite. Revisions can be:

1. Removed globally using the Cleanup button in the *File/Doc Preferences...* dialog box. Removing revisions using this command also gives you the option of selecting which revisions out of multiple revisions you want removed.

2. Removed from a paragraph by clicking in a paragraph and using *Edit/Revise Paragraph* or *Edit/UnRevise Paragraph.*

3. Removed from a selection of text using *Edit/Revise Selection* or *Edit/UnRevise Selection.*

❏ Library

The Library is used to store pictures or arbitrary-sized fragments of text and mathematics, which can later be inserted into your document. You can open as many libraries as you wish. Use *File/Preferences...* to define a set of libraries that you might want opened automatically when *MathWriter* starts up.

▲ What a Library Entry Consists Of

A library entry has three parts:

1. The text of the entry, e.g., $\sqrt{2}$

2. The macro that invokes the entry from the keyboard, e.g., sq2; ideally this would be something that normally wouldn't show up at the end of a word, because of the fact that the spacebar invokes the macro

3. An optional displayed description of the entry, e.g., "square root of 2"

Popup menu for selecting other open libraries for viewing. All open libraries are available for use.

| Libraries |
| Temp Library | 1 entry |
| sq2 | $\sqrt{2}$ |

The macro   The library entry

Click here to toggle between the macro entry and the description

▲ How To Create a New Library Entry

Select some text in your document, or put a graphic on the clipboard, and use *Windows/Library/New Entry From Selection...* or *Windows/Library/New Entry From Clipboard....* The dialog box requires you to enter a macro and an optional description.

▲ How To Use a Library Entry

Either type the entry's macro and press the spacebar or double click the item in the Library Window. Use command-option-spacebar to suppress macro expansion.

❏ Working with Graphics

▲ Graphics Formats Recognized by *MathWriter*

MathWriter recognizes three graphics formats.

• Paint format (PICT - MacPaint®, FullPaint®, SuperPaint®) is the simplest and lowest-resolution format. It is essentially an image of the bits or pixels on the screen. The Macintosh screen has 72 pixels per inch.

> Painted Text (72 dots per inch)
> The pixels are visible when printed.

• Object/Draw format (PICT - MacDraw®, SuperPaint®) utilizes the drawing commands available to the Macintosh hardware to produce pictures independent of the resolution of the output device, which overcomes the limitation of the Paint format.

> Object PICT Text (300 dots per inch on LaserWriter)
> Device independent

• Encapsulated PostScript format (EPSF - Illustrator®, FreeHand®) contains a PICT representation for the screen and a PostScript representation that speaks directly to a printer that understands PostScript such as an Apple LaserWriter. Use this format for the best resolution and detail. This representation, however, increases memory usage.

> Encapsulated PostScript
> Additional capabilities like binding text to a path

▲ How To Insert Graphics

Graphics can be inserted either from the Clipboard using *Edit/Paste* or can be directly imported using *File/Import Graphics*…. The graphic is inserted at the insertion point and is treated as a single symbol. You can't edit the graphics other than cropping and scaling as outlined below; use the graphics program from which the picture came to make any changes to its contents.

▲ How To Edit Graphics

Use the Character Editor (described previously) to edit graphics. When a picture is selected using this editor, it acquires four "handles" in each of the four corners of the graphic. In addition to changing its vertical position as described in the section *Character Editor*, you can also crop or scale a graphic by clicking and dragging in one of the four handles.

To scale: use *option* key for proportional scaling ⎫
                                                                    ⎬ and drag a handle.
To crop: hold down the ⌘ key   ⎭

Graphic with handles   Scaled Graphic   Cropped Graphic

Use *Edit/Scale Picture…* to enter scaling percentages.

❏ Sidebars

▲ What Is a Sidebar

A sidebar is a rectangular region within a document that contains either a picture or editable text isolated from the body of the document. Multiple lines of text can flow around the sidebar. A sidebar can be:

a. floating, which means it is attached to the first line of a paragraph and moves with the paragraph, or it can be placed in one of four positions as illustrated at the right (text in the body of the document wraps around the Left and Right sidebars);


Left Margin   Left   Right   Right Margin
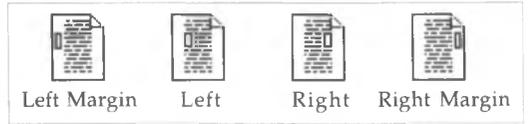
b. a background picture, which can be placed anywhere on the page on a layer behind and independent of the page contents.

▲ How To Create a Sidebar

Select the Sidebar Editor from the Tools Window or the *Windows* menu. The Message Area at the left of the screen changes to show where paragraphs begin. To attach a sidebar to a paragraph, select the appropriate paragraph marker and use the *Edit* menu to create either a

☐ Paragraph Marker

■ Selected Paragraph Marker

▣ Paragraph With Floating Sidebar
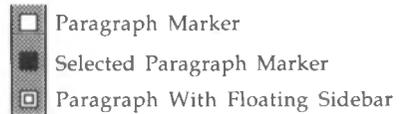
text sidebar or a picture sidebar. To create a picture sidebar, you will need to put a picture on the clipboard by copying it out of another program or by using the *File* menu to import it directly from a file. A background picture also comes from the clipboard, but it can be inserted anywhere on the page.

▲ How To Edit a Sidebar

Using the Sidebar Editor, click in the sidebar that you want to edit. The size of a sidebar can be changed in the same manner as a graphic as explained previously. Additionally, a background picture can be repositioned by dragging from the center of the picture.

❏ Special Keyboard Commands

▲ Arrow Keys

			Moves insertion point $\leftarrow \rightarrow \uparrow \downarrow$
Command			Scrolls document large amount
	Option		$\leftarrow \rightarrow$ = beg./end of line; $\uparrow \downarrow$ top/bottom of page/doc.
		Shift	Extends selection
Command	Option	.	Scrolls document small amount
Command		Shift	Move between cells in a matrix/table
	Option	Shift	Extends selection

▲ Command Key

⅄ or ▶	Doesn't allow selection of sublines
[	↑ (Use with Shift for ▶)
]	↗ (Use with Shift for +)
;	↓ (Use with Shift for ⅄)
'	↘ (Use with Shift for])
Drag left margin marker	Doesn't move indent marker
Drag corner of picture of sidebar	Crops picture or sidebar
With Shift key and Hyphen	Discretionary Hyphen

▲ Option Key

While using ⅄ or]	Toggles between ⅄ and]
▶ + stretchable symbol	Enables stretching
Click in vertical scroll arrows	Slow scroll
Drag any tab or margin marker	Smooth drag
| symbol in Palettes (Operators)	Symbol extends to height of line
Drag corner of picture of sidebar	Scales picture of sidebar

▲ Spacebar

Command			Toggles Greek Alphabet (*Style/Greek*)
	Option		Non-breaking space
		Shift	Library context sensitivity (see *Windows/Library/Preferences*)
Command	Option		Cancels Library expansion and inserts a space