3 Chapter 3 Technical word processing

3.1 Chapter Overview

We learn how to use Maple as a word processor. This allows us to "write up" reports, combining technical writing with math formulae, calculated results, pictures, tables, etc. Many of the features are highly similar to Microsoft Word or similar WYSIWYG (what you see is what you get) word processors. The strength of Maple's word processing is that it makes it easy to enter technical formulae, and that the word processing and calculation can be done in the same document.

3.2 Maple as a word processor

Maple documents allow a mixture of text and mathematics. By default, Maple expects that when you position the cursor by clicking somewhere in the document, you will be entering math and be wanting it do to a calculation. The document is in what is called math entry mode.

Table 3.1: Maple in math entry mode

You can tell whether the document is in math entry mode because the Math button on the Maple toolbar will be gray, and the "C" menu item says 2D Math.

The other mode of operation for Maple documents is text mode. When in text mode, Maple has the behavior of a word processor. It just shows what you typed. Hitting enter while you are in text mode just causes text entry to move to the next line. It does not cause any calculation to be done with what you typed.
You can switch to entering text in the following way:

1. Position the cursor at the spot where you want to enter text.

2. Click on the **Text** button on the Maple toolbar. This places the Maple document in **text entry mode**. Alternatively, you can switch to text mode by typing control-T (on Macintosh, command-T) or by using the Maple menu bar Insert->Text. You can tell when you've switched to text entry mode because the Text button will be gray, and the "C" menu item says **Text**.

3. With the keyboard, enter your verbiage. When you are in text mode, you will also see that the menu bar will be enabled for boldface, italics, underlining, left-/center-/right-justified text, colored text, and colored backgrounds, and bulleted/numbered text.

4. To switch back to math, click on the **Math** button on the Maple toolbar. Alternatively, you can type control-R (on Macintosh, command-R) use the Maple menu Insert->2-D Math.

### Table 3.2: Document after control-T (or Insert->Text)

A Maple worksheet in text mode in OS X. Although it is hard to see, the cursor is positioned at top left of screen.

You can do mathematical word processing without any computation by switching between text and math modes, using the Palettes to help you enter the math. As long as you don't hit the *return (enter)* key, the math will not cause any calculation.
Table 3.3: Document with a mixture of text and math

Richard saw in his physics textbook, *Stephen Hawking for Dummies*, a description of Newton’s law of gravitation:

\[ F = \frac{G \cdot m_1 \cdot m_2}{R} \]

where it was expected that \( m_1, m_2, \) and \( R \geq 0 \). Although he didn’t consider himself a strong physics student, he was glad that hadn’t dumbed down the material so much that it lost all the mathematics.

The user typed the text, then went into math mode by typing control-R (command-R). They then entered the "F = G..." formula in math mode. The user got the subscripted \( m \) by typing an underscore _ after the \( m \) to get Maple to descend to subscripts, then used the right-arrow key to ascend back up to the main level of the expression. The other symbols in the midst of the rest of the narrative are entered in a similar way.

It is possible to mix text and the results of calculations in a paragraph. Typing control-= (command-=) when the cursor is in a math expression will cause Maple to print an "=" and then the result of evaluating the expression *on the same line*. This is an alternative to hitting the *enter* key and allows those kinds of calculations to be mixed with text.

Table 3.4: control-= puts the results of a calculation in the midst of text

The user entered text, then did a control-R (command-R), then entered the math expression and then typed control-=. After the calculation result appeared, they typed control-T and entered the remainder of the sentence.
3.3 Shortcuts to entering math symbols

Using the Palettes, we can enter a wide variety of mathematics -- expressions, math symbols, Greek letters (using the Greek Palette), arrows, etc. There are additional Palettes not shown by default, which you can get by View → Palettes → Show All Palettes. However, you can enter many symbols in math mode from the keyboard through "shortcuts". Most of the shortcuts consists of typing the textual name of the symbol or some abbreviation of it, and then hitting the escape key -- the key labelled Esc on many keyboards.

For example, to enter the symbol \(\infty\) while in math mode, you can type infin and then hit the escape key. A pop-up menu of choices will appear to allow you to complete entry of the symbol. With practice, this can be a faster way of entering "infinity" than using the Palettes.

Table 3.5: Keyboard shortcuts in math mode through the escape key

<table>
<thead>
<tr>
<th>In math mode, we type infin.</th>
<th>After hitting the escape key, a menu of completions appears.</th>
<th>We pick the first alternative (either by hitting the return key or by operating the mouse to select the first option) and what we typed is replaced by the selection.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="infin.png" alt="Image" /></td>
<td><img src="infin_esc.png" alt="Image" /></td>
<td><img src="infin_esc_pick.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Greek symbols can be entered by typing the romanized name of the letter, followed by escape. For example, in math mode, typing omega followed by escape produces \(\omega\). Typing Omega followed by escape produces \(\Omega\) (the upper case version of the Greek letter).

A shortcut to entering the symbolic constant \(e\) (the base of the natural logarithm) is to type e, then hit the escape key, then return.

You can see a summary to all of the conveniences Maple offers through Help → Quick Reference.

3.4 Other word processor features

Inspection of the worksheet toolbar reveals many more word processing features: line justification, bold face and italics, numbered items, colored letters or backgrounds, font sizes, and font types. The Insert operation on the Maple toolbar allows creation of Tables and Images (graphics files). Rudimentary drawings can be inserted through Insert → Canvas. We encourage you to explore and make use of the features on your own.
3.5 Troubleshooting word processing

A phenomenon that you may encounter is not being able to switch back to math mode from text mode, even after performing the operation that should do so (clicking on the Text button of the document toolbar, typing control-T, performing Insert → 2DMath, etc. This may be due to the worksheet losing track of where you are in the document. A "sure-fire" cure for switching modes is to position the cursor at the point where you want to enter math, then do Format → Create Document Block. A dashed box will appear at the location of the cursor, indicating that it is again in math mode.

Tools→Spellcheck (alternatively, the F7 key) will run a spelling check on the non-math part of your document.

3.6 Summary of Chapter 3 material

<table>
<thead>
<tr>
<th>Name</th>
<th>Menu operation</th>
<th>Key short cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Important word processing operations in a Maple worksheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch entry to 2D Math mode</td>
<td>Insert→2D Math Click on &quot;Math&quot; oval in menu bar just below names of worksheets.</td>
<td>control-R (command-R on Mac)</td>
</tr>
<tr>
<td>Switch entry to Text mode</td>
<td>Insert→Text Click on &quot;Text&quot; oval in menu bar just below names of worksheets.</td>
<td>control-T (command-T)</td>
</tr>
<tr>
<td>Use a keyboard shortcut in Math mode</td>
<td>Type the shortcut, then hit the escape key. For example, typing omega and then escape will turn the text into ω. Typing e and then escape will allow you to turn the text into the symbolic constant e without needing the Expression Palette.</td>
<td></td>
</tr>
</tbody>
</table>