

Just Enough Maple for Calculus

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This worksheet is intended to give you just enough Maple to let you run the Maple worksheets for Calculus. We start with worksheets and move to documents later.

To get started, do one of two things. Either click on the gray triangle to the left of the words "Executing sections:", or click to place the cursor to the right of the red prompt > below and hit enter or return. This latter action executes a blank line of Maple code. Any time you execute a line or block of Maple code, the cursor automatically jumps down to the next block of code, in the process opening the section in which that code is located. In every worksheet, be careful not to skip over closed sections - watch especially for Exercise subsections.

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Executing sections:

The Maple worksheets will contain executable lines where Maple does mathematics. These lines begin with a red input prompt (a ">"). To execute those sections, place the cursor anywhere in the command section and hit the "enter" or "return" key. Maple will execute the code and move the cursor down to the next input section.

Execute the code sections below now.

> *answer* := 1 + 1;
answer;

answer := 2
2

(1.1)

> *answer2* := $2^2 + \frac{3}{4}$;

answer2 := $\frac{19}{4}$

(1.2)

> ***answer3* := 2^2+3/4;**

answer3 := $\frac{19}{4}$

(1.3)

Notice that, in Maple, commands end with a semicolon and values are assigned to a variable with the " := " symbol. You should also notice that the Maple input can either appear in a 1-D (like you would type into a calculator) or a 2-D (Like you would write on a piece of paper) layout.

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Typing in commands:

Since this is a math course, the worksheets you do will have exercises embedded in them. You need to be able to type in your own commands. By default, Maple puts the mathematics you type into the standard arrangement you would use writing by hand. (Maple defaults to 2-D mode.) One starts a power with the ^ (shift 6) key, and uses the right arrow to get out of the exponent.

Exercise

At the input prompts below, enter the commands
myanswer := 1 + 2;

$myanswer2 := 3^2 + \frac{4}{5};$

to assign the value of 3 to the variable `myanswer` and 49/5 to `myanswer2`. (Notice that there is no space in `myanswer`.)

$> myanswer := 1 + 2;$
 $myanswer := 3$ (2.1.1)

$> myanswer2 := 3^2 + \frac{4}{5};$
 $myanswer2 := \frac{49}{5}$ (2.1.2)

Sometimes you will want to type the input using 1-D mode. (You can tell which mode you are in by looking at the cursor. The cursor will slant, like italics, in 2-D mode, and be straight up and down in 1-D mode.)

Exercise

Put your cursor on the prompt below, switch to Maple input mode with the insert menu, and enter the command

`myanswer3 := 3^2+4/5;`

$> myanswer3 := 3^2 + \frac{4}{5};$
 $myanswer3 := \frac{49}{5}$ (2.2.1)

For some of the exercises you will want to use a series of commands. This raises the two practical questions:

- 1) How do you put more than one command line in a section with a single input prompt? (Hitting return executes the line.)
- 2) How do you insert more input prompts in the middle a worksheet?

The easiest way to put two lines of input in a single prompt is to start in 1-D Maple input mode, and type a shift-return at the end of the first line. You can also start in 2-D mode, shift to 1-D mode, type shift return, then return to 2-D mode.

You insert a new input prompt by either going to the insert menu, select execution group, after paragraph, or by typing flower-J (command-J on a PC), where "flower" is the mac command key.

Exercise

Enter the command sequence:

`answer1 := 1 + 3;`

`answer1;`

on two lines at the single cursor below. Then insert two execution groups below it and reenter the commands in separate execution groups.

$> answer1 := 1 + 3;$
 $answer1;$
 $answer1 := 4$
 4 (2.3.1)

The answer is 4. 1+3=4.

Adding text:

When doing mathematics exercises, it is important to answer the question asked, rather than simply showing some uninterpreted computations. Raw Maple output will never be considered a sufficient answer. Thus you need to be able to add explanatory comments to your computations, even if it is simply, "The answer is ..."

To add a text section, either insert an execution group and convert it to text with flower-t, or use the insert menu to insert a paragraph.

Exercise

Annotate your work in the previous section with the comment that " $1 + 3 = 4$ ".

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Cutting and Pasting:

Some of the exercises involve several lines of code that follow an example with only minor modifications. Obviously you could retype everything, but that is too much work. The easier method is to

- highlight the material you want to copy,
- copy it with either the copy command from the edit menu or the control-c (PC) or flower/command-c (Mac) key,
- move the cursor to where you want the material put,
- paste the material in with either the paste command from the edit menu or the control-v/flower-v key,
- edit the changes you want

Exercise

Copy the two command line section that assigns a value to answer1 above. Paste it in below and modify it to assign a value to answer2.

```
> answer2 := 1 + 3;  
answer2;
```

```
answer2 := 4
```

```
4
```

(4.1.1)

Saving and printing:

When you start a prepared worksheet, you should get a warning message that the worksheet is locked and changes cannot be saved. Instead you should choose "save as" from the file menu, pick a new name for the worksheet (a name that identifies the worksheet as yours), and save your work. You should then print the worksheet so that you can turn it in.

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Sometimes you will have problems printing a Maple file. (This is most likely to happen if the file has lots of complicated graphics.) It is then useful to export the Maple file to another application and print from the other format. We will look at turning the worksheet into a web page that can be printed from a web browser.

- 1) Go to the desktop of your machine and make a new folder. Label it MapleForWeb.
- 2) From Maple, go to the File menu and select "Export as, HTML..."
- 3) Save the file in the folder with an appropriate name.
- 4) Open the HTML file in a browser and print from there.

