

Just Enough Maple

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This worksheet is intended to introduce you to just enough Maple to let you run the Maple worksheets for Linear Algebra.

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Starting and Saving:

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. (Do this now.)

Executing sections:

A Maple worksheet contains executable lines where Maple does mathematics. These lines begin with an input prompt (a ">") and are in red. 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 section below now.

```
> answer := 1 + 1;  
answer;
```

Notice that in Maple commands end with a semicolon and values are assigned to a variable with the ":= " symbol.

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. At the input prompt below, enter the command

```
myanswer := 1 + 2;
```

to assign the value of 1+2 to the variable myanswer. (Notice that there is no space in myanswer.)

```
> myanswer := 1+2;
```

For some of the exercises you need 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?

Answers:

You continue an input section to a second line by typing a shift-return.

You insert a new input prompt by either going to the insert menu, select execution group, after paragraph, or by typing control-J on a PC or command-J on a Mac (The command key is the one labeled with the Apple logo and/or a "flower").

Enter the command sequence:

```
answer1 := 1 +3;  
answer1;
```

on two lines at the single cursor below. Then insert two execution groups below it (first click somewhere in the first execution group) and reenter the commands in separate execution groups.

>

Adding text:

When doing mathematics exercises, it is important to answer the question asked, rather than simply showing some uninterpreted computations. 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 control-t or command-t, or use the insert menu to insert a paragraph.

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

An obvious annotation you want on all worksheets is your name. On all worksheets after this one, the first thing you should do after opening it is to add a line under the title that gives the name of everyone in the group that is working on the worksheet, along with your group name. (Add your name to this worksheet now.)

>

Cutting and Pasting:

Some of the exercises involve using several lines of code that duplicate an example with only minor modifications. Obviously you could retype everything, but that is not necessary. An easier method is to

- highlight the material you want to copy,
- copy it with either the copy command from the edit menu or by using control-c or command-c,
- move the cursor to where you want the material placed,
- paste the material in with either the paste command from the edit menu or by using control-v or command-v,
- edit the pasted commands to what you need for the 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.

>

Loading extra packages:

Much of the work we do uses special commands that are in a number of special add-on packages of commands. In particular, we will want to load packages with commands for linear algebra, and for

plotting. Thus the first execution group of our worksheets will often be:

```
> with(LinearAlgebra): with(plottools): with(plots):
```

Make sure you execute this group before moving on in any worksheet. Execute the group above. Note that commands terminated with a colon have suppressed output (except for warnings), which is useful for when the output is not all that useful. If you change any or all of the colons above and re-execute the group you will see in the output a list of commands provided by the package. Since the worksheets provide examples of the commands you will need to use it is generally not useful to see these commands listed in every worksheet.

Reloading a worksheet:

Some of the worksheets will be done in class, but they are generally designed to be long enough that you will have to complete them after class. When you reopen a worksheet, you should be aware that Maple will only remember what you have done during that new Maple session instead of what you did while working previously on the worksheet. Thus you will need to re-execute sections that define quantities and terms you are using. In particular, you should start by re-executing the line that loads in extra packages.

```
>
```

Saving and printing:

It is generally a good idea to save your work at least every 10 minutes. (Machines/programs crash at the most inconvenient times. People who work with computers learn that "Murphy was an optimist".) The last thing you want to do with a worksheet is to save it to disk and then to print a copy so that you can turn it in. (Do this now.)

```
>
```