

# Maple Project 1 MTH 141 Fall 2003

The purpose of this homework is to get you started with the basics of Maple syntax. Follow the steps given below.

- a. Use a computer with Maple installed on it (for example, a computer in one of the several URI computer labs) to download and read the Maple worksheet `intro141.mws`. You may find it in our website [www.math.uri.edu/Courses/fall103/mth141](http://www.math.uri.edu/Courses/fall103/mth141).
- a. While in Maple, open a new Maple worksheet document by selecting *File* → *New* from the drop-down menu.
- b. Click on the screen T button at the top of the worksheet. This sets the “Text mode”. Type your name, class and section, and the words “MTH 141 Maple Homework 1”
- c. Proceed to answer the questions given below (and not the questions from the worksheet `intro141.mws`). Recall that to type Maple commands you need to first click on the screen [`>`] button to produce a Maple input prompt.
- d. Make sure you save your work to a diskette. If you do not have one available, you may *email* the worksheet to yourself as an attachment.
- e. You will be given instructions in class on how to submit your work.

## Questions

1. Find the exact and the decimal value for  $\frac{\sqrt{23+15}}{10^2+\frac{1}{5}} - \frac{3-9}{2+4} - 2$ .
2. Solve the equation  $6x^2 - 3x - 1 = 0$ . Also, obtain a decimal approximation to the answer.
3. Simplify the expression:  $\frac{3x+4}{x^2-25} + \frac{7}{x-5} + 1$
4. The population  $P(t)$ , in thousands, of a town  $t$  years after January 1, 2000 is given by the function  $P(t) = \frac{125}{1+4e^{-0.5t}}$ .
  - (a) Define the function P(t) in Maple.
  - (b) What was the population on January 1, 2002? On June 1, 2002?
  - (c) Plot the graph of the population from January 1, 2000 until January 1, 2010.
  - (d) Assuming that the present trend continues, when will the population reach 120 thousand?

## COMMENTS and additional information

- Maple homework should have only one author. You may discuss the project with your classmates, but what you turn in should contain your own answers. Plagiarism is a serious offence.
- Whenever possible, insert a text comment to explain what you are about to do. Neatness and good English will be taken into account.
- Maple should be used in all calculations and plots.
- MAPLE HELP will be available in Tyler 101. The schedule and location will be announced in [www.math.uri.edu/Courses/fall102/mth142](http://www.math.uri.edu/Courses/fall102/mth142)

## USEFUL MAPLE COMMANDS

```
> restart;                # good to have this at the top of worksheet;
> eval(%)                 # give a decimal approximation to the previous output
> f:=x->x^2;              # define the function f(x)=x^2
> g:=x->evalf(x^3);       # define the function f(x)=x^3,
                           # and force it to give decimal output when evaluated
> plot(f(x),x=-1..1,y=0..2); # plot y=f(x) for -1 < x < 1 and 0 < y < 2
> plot([f(x),g(x)],x=0..2);# plot two functions for x between 0 and 2.
> solve(f(x)=g(x),x);     # solve the equation f(x) = g(x) for x.
> fsolve(f(x)=0,x,-2..2); # find an approximate solution to the equation
                           # f(x) = 0 for x in the interval -2 < x < 2.
> Pi ;                   # the constant 3.1415...Note the it begins with capital P.
> exp(2.5);              # exponential function evaluated at 2.5
> log(2.5);              # the natural logarithm of 2.5
> 2^(1/2)                 # the square root of 2
> 2^(1/3)                 # the third root of 2
```