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

a. Bring a disk with you and access Maple on a computer with Maple installed on it (for example, a computer in one of the several URI computer labs). You can do this by downloading the Maple worksheet intro141.mws.

b. While in Maple, open a new Maple worksheet document by selecting File → New from the drop-down menu.

c. 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”

d. 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.

e. Make sure you save your work to your disk. If you do not have one available, you may email the worksheet to yourself (NOT your professor) as an attachment.

f. You will be given instructions in class on how to submit your work.

Questions

1. Find the exact and the decimal value for $\frac{\sqrt{210}}{8^3 + \frac{4}{3}} - \ln(5.62)$.

2. Find the all solutions to the equation $-x^3 + 9.3x^2 + 115x - 190$. Also, obtain a decimal approximation to the answers.

3. Simplify the expression: $\frac{3x+4}{x^2-25} + \frac{7}{x-5} + \frac{3x}{x+5}$

4. The population $P(t)$, in thousands, of a town $t$ years after January 1, 2000 is given by the function $P(t) = \frac{500}{1+3e^{-0.2t}}$.

   (a) Define the function $P(t)$ in Maple.
   
   (b) What was the population on January 1, 2002? On September 1, 2002?
   
   (c) Plot the graph of the population from January 1, 2000 until January 1, 2030.
   
   (d) Assuming that the present trend continues, when will the population reach 450 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 soon.

USEFUL MAPLE COMMANDS

> restart; # good to have this at the top of worksheet;
> evalf(%) # 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,
> 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
> 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