

Maple Project 1 MTH 141-07 Fall 2005
Department of Mathematics, University of Rhode Island

FOR QUESTIONS REQUIRING AN EXPLANATION, ANSWER EACH QUESTION IN CLEAR, COMPLETE SENTENCES. YOU WILL NOT GET ANY CREDIT IF YOU ONLY GIVE THE GRAPHICAL OUTPUT WITHOUT ANY EXPLANATION. TYPE ALL EXPLANATIONS AND COMMENTS IN MAPLE IN YOUR WORKSHEET.

In order to do problems you must have done the Maple exercises associated with Readings I, II and III of the Maple manual.

DUE: OCTOBER 13

1. Expand the following expressions

(a) $(x - 1)(x^2 + x + 1)^3(x^3 + 1)$

(b) $[(2x - 1)^2 - 1]^2$.

2. Solve the following equations using the **solve** command. Check your answers with a plot. In each case substitute the roots into the expression on the left side of the equation to verify that roots satisfy the equation.

(a) $3x^4 - 4x^3 + x^2 + 6x - 2 = 0$.

(b) $x^3 - 8x^2 + 17x - 4 = 0$.

3. Consider the polynomial $x^6 - 21x^5 + 175x^4 - 735x^3 + 1624x^2 - 1764x + 720$.

(a) Factor it.

(b) Find the roots using the Maple command **solve**.

(c) Verify your answer in (b) by plotting the graph of the polynomial. Adjust the domain of your plot so that the roots are clearly shown.

4. Plot the functions x^4 and 2^x on the same set of axes, and determine how many times their graphs intersect. (hint: You will probably have to make several plots using intervals of various sizes, in order to find all the intersection points. You may have to limit the y -range in your plots). Now find the values of the points of intersection by using the **fsolve** command.

Additional Information

1. To use some plotting commands, you need to load the package plots

`with(plots):`

2. The final project should have only one author. You may discuss the project with other students in class, but what you should turn in should be your own original ideas.
3. Submit a hard copy.
4. MAPLE should be used in all calculations and plots.