Math 1133

Name(s) _____

Derive Assignment #1

Due: _____

You may do this assignment by yourself or with up to two of your classmates.

Solve each of these problems using DERIVE. Your presentation of solutions must be neat, clear, and concise. You may report answers only, with no justification unless otherwise indicated. In most problems you are asked to hand in either a graph or a printed screen showing your results. Label graphs by indicating the function that has been graphed. Use text if you feel that words will enhance your display. Please staple your papers and do NOT use paper torn from a spiral notebook. Sloppy papers will not be graded.

You may "check" your answers by using your graphing calculator whenever possible. If you do not have a solver on your graphing calculator, you could solve any equations graphically. Your goal is to be equally comfortable with both uses of technology and to learn advantages and disadvantages of each.

1. Given the function $f(x) = x^3 + 7x^2 - 3x - 2$, print a graph that shows the relative extrema. Annotate the graph stating the approximate coordinates of each extremum.

2. Use the solve command to solve the equation $x^3 + 7x^2 - 3x - 2 = 0$. Print an approximation for each of the solutions.

3. Graph the function $g(x) = \left|\frac{\sin(25x)}{25}\right| - x$. Zoom to obtain what you think is the most complete view. Include one graph which shows this view. Indicate the scale that you use on your printed graph. (The best view is **not** linear)

4. Let $f(x) = \frac{\cos x}{x}$. Find the smallest integer N so that $|f(x)| < .01$ whenever $x > N$. Support your result with a printed graph.

5. Evaluate the expression $2x^3 - \cos 2x + e^x$ at $x = 3.4$ using DERIVE (Round to 2 decimal places, No graph needed; print screen that displays your answer).

6. Use DERIVE to find the derivative of $f(x) = x^3 cos\, x$. Print a graph which shows both the graph of the function and the graph of the derivative in the same window. Annotate the graph to indicate which is the graph of the function and which is the graph of the derivative. Also print the algebra window which shows the function and the simplified derivative.