

HOMEWORK 1, MATH 233
DUE MONDAY, JANUARY 14, 2002

NAME _____

There are three problems, each worth 10 points for a total of 30 points. Be sure that your name appears printed in the title of each graph that you produce. Hand in only the graphs, not your scripts. Put the graphs in order with the problem number clearly indicated for each. Use this sheet as the cover sheet, with your name written in the blank above, and staple all sheets together in the proper order.

- (1) (Like #1 pages 13-14 of ML) Graph $y = 2 \sin 3x + 3 \cos 2x$ over the interval $0 \leq x \leq 4\pi$. Use 200 equally spaced points for the independent variable. Put your name and the formula $y = 2 \sin 3x + 3 \cos 2x$ in the title. Label the axes x and y , as appropriate.
- (2) By hand calculate the derivative, $\frac{dy}{dx}$, of the function $y = \frac{3x^2 - 5x + 2}{x^2 + 1}$.
 - (a) On the same graph plot the function y and its derivative over the interval $-2 \leq x \leq 2$. If you have a color printer, make the graph of the function red and of the derivative green. If you don't have a color printer, make the graph of the function a solid line and of the derivative a dotted line.
 - (b) Put a legend on the graph.
 - (c) Label the axes and include a grid.
 - (d) In the title, put your name and the phrase "Graph of $f(x)$ and its derivative $f'(x)$ ".
 - (e) On the top margin of the print-out of your graph write by hand your calculation of y' .
- (3) (Like #36 page 652 §9.1) Find the volume of the solid that lies inside both of the spheres $x^2 + y^2 + z^2 - 2x - 4y - 4z + 8 = 0$ and $x^2 + y^2 + z^2 = 16$. Include a hand sketch of this configuration.