Math 16, Homework 8

A. Do the second differentiation practice sheet (find it on the web page.) Also do the first practice sheet if you have not done so already.

B. Do the following additional exercises.

1. Find the tangent line to $f(x) = xe^{-x}$ at $x = 2$.

2. Analyze the function $f(x) = x^2 e^{-x}$ (following the pattern of the example done in class.) Find the intervals on which the function is increasing and decreasing. Find the intervals on which the (graph of the) function is concave up or concave down. Note that the function itself is always positive except at $x = 0$, where it is zero. Use the information which you have found to sketch the graph of the function. Compare the graph with what you get using your graphing calculator or a computer.

3. Analyze the function $f(x) = x^3 - 7x^2 + 3x - 5$ in the same manner.

4. Analyze the function $f(x) = xe^{-x^2}$ in the same manner.