Math 190 Lab 6: Oct 20 and 22

Work through the following problems while the instructor and TA circulate. When you have completed the problems (to the satisfactory of the facilitators) you can spend the rest of the lab working on the weeks homework.

Warm up: Differentiate the following

- $3e^x$

- $3xe^x$

- $x\sin(x)$

- $\frac{x\cos(x)}{x^2}$

- $e^2e^x x^{-1}$ (do this problem once using product rule and again using quotient rule)

Questions:

1. Consider the function
$$h(x) = \frac{x^2 + 2x + 1}{x + 1}$$

   (a) Find the equation of the line tangent to $h(x)$ at the point $x = 4$.

   (b) Find the equation of the line perpendicular to your tangent line from part (a). This line is called a *normal line*.

2. (a) Differentiate $x(x+2)^2$ using the product rule.

   (b) Differentiate $x(x+2)^2$ by multiplying everything out and using the power rule.

   (c) Do you get the same answer for both?