Math 190 Lab 6: Oct 18 and 20

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

- $3e^x$

- $3xe^x$

- $x\sin(x)$

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

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) Which method did you use for part (a)? Was it Quotient Rule? If so, consider simplifying $h(x)$ by factoring and cancelling (and of course noting that $x \neq -1$). After this manipulation you can find the derivative easily using Power Rule. Sometimes simplifying a function before you take the derivative can save time.

2. Consider the function

$$\frac{e^2 e^x}{x}$$

(a) Differentiate the above function using quotient rule.

(b) Rewriting the function as $e^2 e^x x^{-1}$ compute the derivative using product rule.

(c) With a little algebra you should be able to convince yourself that these two methods yield the same result.