Test 2 Review

•The test will cover sections 3.2 through 3.9.

•To study, you should look over your notes, rework HW problems, quizzes, and work out the practice problems from the list on blackboard. The Review Questions at the end of Chapter 3 will also be good practice.

•You can also try taking a "practice" test under normal testing conditions by choosing a question from each section (of the practice problems I gave you, or from the supplementary questions at the end of Chapter 3) and then trying to work these questions out on your own in 65 minutes. This can be helpful if you are the type of person who has test anxiety.

•Some practice problems to work on in class today:

1) Find y' if $y = \dfrac{xe^{-x}\cos x}{\ln x}$

2) Find the x-coordinate(s) when the given function has a horizontal tangent line

$$T(x) = x^2 e^{1-3x}$$

3) Find $\frac{dy}{dx}$ if $y = \sqrt[3]{x + \sqrt{2\sec x}}$

4) Find y' if $\ln(xy) = e^{2x}$

5) Use logarithmic differentiation to find

$$\frac{d}{dx}(x^{\ln\sqrt{x}})$$

6) Calculate $\dfrac{d}{dx}\tan(\arctan x)$ two different ways- First take the derivative and then simplify your answer. Next, simplify the expression first and then take the derivative. (Hint: $\cos(\arctan x) = \frac{1}{\sqrt{1+x^2}}$....do you know how to prove it?)

7) In a healthy person of height x inches, the average pulse rate in beats/minute is given by

$$P(x) = \frac{596}{\sqrt{x}}$$

Use differentials to estimate the change in pulse rate that corresponds to a height change from 49 to 50 inches.

8) Given the function $f(x) = \ln(2 - x)$, (a) find the linearization $L(x)$ at $a = 1$, (b) use $L(x)$ to approximate $\ln(1.1)$, and (c) calculate $\ln(1.1)$ on your calculator. How close is your approximation?