Homework 2 - Math 141, Frank Thorne (thornef@mailbox.sc.edu)

Due Monday, September 10

This one is short! Enjoy the break while you can.

Required problems:

(a) Suppose that you are given the graph of the function $y = f(x)$, and you want to find the slope of the tangent line to the graph at the point $(a, f(a))$. Explain how to guess this slope by finding the slopes of secant lines.

(b) Given the slope of the tangent line to the graph of $y = f(x)$ at the point $(a, f(a))$, explain how to find the equation of this line.

(c) By finding the slopes of appropriate secant lines, determine the equation of the tangent line to $y = x^2$ at $(1, 1)$.

(d) By finding the slopes of appropriate secant lines, determine the equation of the tangent line to $y = -x$ at $(4, -4)$.

(e) By finding the slopes of appropriate secant lines, determine the equation of the tangent line to $y = x^3 - 3$ at $(1, -2)$.

(f) Stewart, Ch. 2.2, 1-4, 7, 9, 13.

Additional problems:

(a) Stewart, 2.2, 5, 6, 14.

(b) By finding the slopes of appropriate secant lines, determine the equation of the tangent line to $y = 1/x$ at $(1, 1)$.

(c) By finding the slopes of appropriate secant lines, determine the equation of the tangent line to $y = -1/x^2$ at $(2, -1/4)$.

Bonus: Describe a function and a point for which this process does not yield an intelligent answer.