Math 141, Problem Set #6
(due **in class** Fri., 10/18/13)

Note: To get full credit for a non-routine problem, it is not enough to give the right answer; you must explain your reasoning.

Stewart, section 2.1, problems 10, 16, 18, 32, 34, 38.

Stewart, section 2.2, problems 4, 8, 34, 36, 40, 48, 49. (For problem 49, use the definition of the derivative as a limit.)

Stewart, section 2.3, problems 42, 54, 62, 68.
Also:

A. Consider the function

$$f(x) = \begin{cases} x+1 & \text{for } x \leq -1 \\ 0 & \text{for } -1 < x < 0 \\ x^2 & \text{for } x \geq 0. \end{cases}$$

Compute the derivative of f, being careful to say where it is undefined.

B. Consider the function

$$f(x) = \begin{cases} x & \text{for } x \text{ rational} \\ -x & \text{for } x \text{ irrational.} \end{cases}$$

Where is $f(x)$ continuous? (Hint: See problem B from assignment #3. You may make use of the fact that every interval contains both rational and irrational numbers.)

C. Consider the function

$$f(x) = \begin{cases} x^2 & \text{for } x \text{ rational} \\ -x^2 & \text{for } x \text{ irrational.} \end{cases}$$

Compute the derivative of f, being careful to say where it is undefined.

Please don't forget to write down on your assignment **who you worked on the assignment with** (if nobody, then write "I worked alone"), and write down on your time-sheet **how many minutes you spent on each problem** (this doesn't need to be exact).