Math 305, Problem Set #9
(due **by email** Friday, 11/20/09, 10:30 a.m.)

Abbott, section 5.2, problems 1(ii), 2(a,b), 3, 4. (In your solution to problem 8, you may appeal to material in section 5.3.)

Abbott, section 5.3, problems 3, 5, 7.

Extra problem A: Suppose that $f(a) = f(b) = f(c)$ where $a < b < c$ with f continuous on $[a, c]$ and twice-differentiable on (a, c). Prove that there exists some x in (a, c) with $f''(x) = 0$.

Extra problem B: Suppose f is continuous on $[a, b]$ and differentiable on (a, b).

(a) Use the Mean Value Theorem to show that if $f'(x) > 0$ for all $x \in (a, b)$, then f is strictly increasing on $[a, b]$.

(b) Is the converse true? (Compare with Exercise 5.3.7(a).)

Note: In your solution to a problem, you may appeal to the results proved on the homework in earlier problem sets or the current problem set (as long as you don't engage in circular reasoning).

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