Problem Set 8   Real Analysis   Due 11/2/2008

Several of these problems will be graded, with each graded problem worth 5 points. Clear and complete justification is required for full credit. You are welcome to discuss these problems with anyone and everyone, but must write up your own final submission without reference to any sources other than the textbook and instructor.

1. Do #9a in §5.1.

2. Do #8a in §5.1.

3. Do #3 in §5.3.

4. Do #5 in §5.3.

5. Do #8 in §4.5.

6. Do #2 in §5.6.

7. Prove or give a counterexample: If f,g are continuous, satisfy $f(a) \leq g(a)$, and $f(b) \geq g(b)$, then there exists a $c \in [a,b]$ such that $f(c) = g(c)$.

8. Prove or give a counterexample: Suppose that a function f is continuous on an interval I. If $a, b \in I$ such that $f(a)f(b) < 0$, then there exists $c \in (a,b)$ such that $f(c) = 0$.

9. Prove or give a counterexample: If f' is bounded, then f is bounded.

10. Prove or give a counterexample: If f is bounded, then f' is bounded.