Math 220, Section 201
Homework #6
due Friday, March 8, 2002 at the beginning of class

Warm-Up Questions—do not hand in

I. Lay, p. 147, #16.8

II. Lay, p. 147, #16.10

III. Prove Theorem 17.1(b).

IV. Prove Theorem 17.4.

V. Lay, p. 155, #17.19(d)

March 8's quiz will be one of these five warm-up questions.

Homework Questions—hand these in

I. Lay, p. 147, #16.9

II. In this problem, (x_n) always refers to a sequence where all of the numbers x_n are different, and $S = \{x_1, x_2, \dots\}$ refers to the set of values taken by elements of the sequence.
   (a) Give examples of such sequences (x_n) where the corresponding set S has no accumulation point; exactly one accumulation point; more than one accumulation point.
   (b) Suppose that (x_n) converges to the limit L. Prove that $S' = \{L\}$. (Hint: if $y \neq L$, choose $\varepsilon = |y - L|/2$ and consider $N^*(y; \varepsilon)$.)

III. Lay, p. 154, #17.5(b), (d), (f), (h), (j), (l). Choose any one of the six to prove your answer rigorously; for the other five, you may simply state the answer without proof.

IV. Lay, p. 155, #17.7 and #17.8

V. Suppose that (s_n) is a sequence of positive terms such that the sequence of ratios (s_{n+1}/s_n) converges to a limit L. If $L > 1$, prove that (s_n) diverges to $+\infty$.