## Math 220, Section 201 Homework #4 due Friday, February 8, 2002 at the beginning of class

## Warm-Up Questions-do not hand in

- I. Lay, p. 113, #12.4(k), (l)
- II. Lay, p. 121, #13.8
- III. Lay, p. 122, #13.15
- IV. Prove that  $x \in \operatorname{bd} S$  if and only if the following statement is true: for every  $\varepsilon > 0$ , there exists a point  $y \in S$  with  $|x y| < \varepsilon$  and there exists a point  $z \in \mathbb{R} \setminus S$  with  $|x z| < \varepsilon$ .
- V. For any set C, prove that int C is an open set.
- VI. Lay, p. 120–1, #13.1 and #13.2

February 8's quiz will be one of the first five five warm-up questions.

## Homework Questions—hand these in

- I. Lay, p. 113, #12.10(b)
- II. Let  $A = \{-\frac{1}{n} : n \in \mathbb{N}\}$  and B = [1.9, 2]. Define  $C = \{x + y : x \in A \text{ and } y \in B\}$ . (a) Write C explicitly as a union of intervals.
  - (b) Verify Theorem 12.7 in this case by determining  $\sup A$ ,  $\sup B$ , and  $\sup C$ .
- III. Lay, p. 121, #13.5 and #13.6 (no justification necessary—just write down the answers)
- IV. Lay, p. 121, #13.10
- V. If B is a bounded set, prove that cl B is also bounded.