

**Math 220, Section 203**  
**Study Questions for Second Midterm**  
(in class Tuesday, March 18, 2003)

- I. D'Angelo and West, p. 268, #13.6
- II. D'Angelo and West, p. 268, #13.7
- III. D'Angelo and West, p. 270, #13.37
- IV. D'Angelo and West, p. 270, #13.39
- V. Write down four different bijections  $f : \mathbb{N} \rightarrow \mathbb{N}$ .
- VI. Let  $A$  be a countably infinite set, and let  $B$  be any set. Prove that  $A \setminus B$  is either finite or countably infinite.
- VII. Prove that all of the following sets have the same cardinality as one another:
  - (a)  $\mathbb{R}$
  - (b)  $(0, 1)$
  - (c)  $(s, t)$ , for any real numbers  $s < t$
  - (d)  $(0, \infty)$(We have already shown in class that (a) and (b) have the same cardinality. Note that it is not enough to show that all four sets are uncountable!)