

Assignment 9

The following problems are due at the beginning of class on Monday, April. 24.

Problem 1: Let A and B be sets.

- (a) Prove that if A is finite, then $A \cap B$ is finite.
- (b) Prove that if A is infinite and $A \subseteq B$, then B is infinite.

Problem 2: Prove that if A is finite set and B is an infinite set, then $B - A$ is infinite.

Problem 3: (Using the Pigeonhole Principle) Suppose a sock drawer contains 7 blue sock and 12 black socks, unfolded and unsorted. In a hurried state one morning, you reach in and grab socks from the drawer without looking at the color. How many socks must you pull out in order to be assured of getting:

- (a) two socks of one color?
- (b) six socks of one color?
- (c) six black socks?
- (d) three matched pairs (possibly including pairs of each color)?