

# CS 1050B: Constructing Proofs

## Problem Set 5

Due Wednesday, Oct 25th, after the class

1. **Rosen 5.3: 30**

Seven women and nine men are on the faculty in the mathematics department at a school

- a) How many ways are there to select a committee of five members of the department if at least one woman must be on the committee?
- b) How many ways are there to select a committee of five members of the department if at least one woman and at least one man must be on the committee?

2. **Rosen 6.1: 10**

What is the probability that a five-card poker hand contains the two of diamonds and the three of spades?

3. **Rosen 6.1: 20**

What is the probability that a five-card poker hand contains a royal flush, that is, the 10, jack, queen, king, and ace of one suit?

4. **Rosen 6.2: 20**

Find the smallest number of people you need to choose at random so that the probability that at least one of them has a birthday today exceeds  $1/2$  (We assume 366 equally likely and independent birthdays).