CS2022/MA2201
HW#6

DUE: Tuesday, September 30

1. (3 points) Do **Exercise 4.2.4** from our text.

2. (4 points) Do **Exercise 4.3.6** from our text.

3. (2 points) If a group contains n men and m women, in how many ways can r people be chosen? What is the answer to this question if m=22, n=14 and r=42?

4. (3 points) Do **Exercise 4.3.20** from our text. You needn't give a numerical answer.

5. (3 points) Jack flips one fair coin (p{heads}=p{tails}=1/2), and Jill flips two fair coins. What is the probability that Jill obtains more heads than Jack?

6. (4 points) A deck of 10 cards, each bearing a distinct number from 1 to 10, is shuffled. Three cards are removed, one at a time from the deck. What is the probability that the cards are removed in sorted (increasing) order? Justify your response.

7. (7 points) (From Martin Gardner, fide Baase) Consider four fair (each face is equally likely) dice containing the following six numbers on their faces:

D_1: 1, 2, 3, 9, 10, 11
D_2: 0, 1, 7, 8, 8, 9
D_3: 5, 5, 6, 6, 7, 7
D_4: 3, 4, 4, 5, 11, 12

- For each pair of dice D_i, D_j, $1 \leq i,j \leq 4$, $i \neq j$, compute the probability in a throw of the dice, that the top face of D_i will be higher than the top face of D_j.
- Suppose Alice and Bob are each throwing a die and whoever throws a higher number wins (nobody wins if both faces are equal). Show that if Bob chooses a die first and if Alice knows which die Bob chose, then Alice can always choose a die with a higher probability of winning than of losing.