Math 341 Spring 2021, Homework 7

1. An experiment consists of tossing a fair coin 3 times and recording whether it lands heads (H) or tails (T) each time.

a. What is the sample space for the experiment?

b. Let A be the event the coin lands heads exactly once. Find $P(A)$.

c. Let B be the event the coin lands tails at most once. Find $P(B)$.

d. Let C be the event the coin lands heads on the first toss. Find $P(C)$.

e. Find $P(A \cap B)$.

f. Find $P(A \cup B)$.

g. Find $P((A \cup B)^c)$.

h. Find $P((A \cup B)^c \cup C)$.

2. Two fair dice are thrown and the outcome is listed as an ordered pair: (# 1st die, # 2nd die). Let A be the event that the sum of the dice is 5 and let B be the event that at least one of the dice lands on 2. List the elements in the events A, B, $A \cap B$, and $A \cup B$ and find the probability of each event.

3a. How many different letter arrangements can be can be made using the letters MOM?

b. How many different letter arrangements can be can be made using the letters PANDEMIC?

c. How many different letter arrangements can be can be made using the letters MISSISSIPPI?

4. A parking lot has 10 parking spaces arranged in a row. There are 7 cars parked. Assume that each car owner has picked a random a parking place among the spaces available. Find the probability that the three empty places are adjacent to one another.

5. From a group of 7 women and 8 men a committee consisting of 4 women and 3 men is to be formed. How many different committees are possible if:

a. 1 man and 1 woman refuse to serve together?

b. 2 men refuse to serve together?

c. 2 women refuse to serve together?