**Classwork 5**

*June 20th 2018*

**Basic Concepts in Probability**

Introduction: Take out several sheets of paper. Put your name at the top of each sheet. Clearly label each problem. Show all of your work. Turn in everything stapled together when you are finished.

**Problems**

1. List the sample spaces for the following experiments:

a. Flipping a coin

b. Rolling a die

c. Flipping a coin after rolling a die.

d. Selecting a single card from a deck of cards.

2. Using the sample spaces from the previous problem, what is the probability of:

a. Flipping a coin and getting a tail?

b. Rolling a die and getting a number that is even and less than or equal to 3?

c. Getting a head or rolling an odd number after flipping a coin and rolling a die?

` d. Selecting a queen or a diamond on a single draw from a deck of card?

3. At a blood donation drive, 50 people have type A blood, 65 have type B, 70 have type O and 30 have type AB. If a person is randomly selected from this group of donors, what is the probability he/she will have type O blood?

4. Consider the experiment of rolling two die.

a. List the sample space for this experiment.

b. What the probability of rolling two die so that the sum of the two numbers on the die equals 7?

*Hint:* Construct a table with the outcomes of rolling one die listed horizontally and the outcomes of rolling the other die vertically. In each entry of the table, compute the sum of the die rolls. Count up the number of times 7 occurs and divide by the total number of possible outcomes.

5. In a group of 40 people, 10 are healthy and every person the of the remaining 30 has either high blood pressure, a high level of cholesterol or both. If 15 have high blood pressure and 25 have high level of cholesterol,  
  
 a. how many people have high blood pressure and a high level of cholesterol?  
  
If a person is selected randomly from this group, what is the probability that he/she,  
  
 b. has high blood pressure (event A)?  
 c. has high level of cholesterol(event B)?  
 d. has high blood pressure and high level of cholesterol (event A and B)?  
 e. has either high blood pressure or high level of cholesterol (event A or B)?

6. A survey was conducted on 100 college students to determine how many read the Washington Post versus the New York Times. It was found 80 read the Post, 65 read the Times and 15 read neither paper. What is the probability a randomly selected student:

a. Reads at least one of the two papers?

b. Reads both papers?

7. At a certain comic book convention, 60 people like Star Wars, 40 people like Star Trek and 20 people like both. What is the probability of someone liking Star Wars, but not Star Trek?

*Hint:* Draw a Venn Diagram!

8. On a given day, the probability of a getting a pop quiz in math class is 0.3 and the probability of the professor being in a good mood is 0.3. The event of getting a pop quiz and the event of the professor being in a good mood are independent. What is the probability of the professor being in a bad mood and not getting a quiz, i.e. what is the probability of neither of these two events occurring?

9. A bag coins three golds coins, two silver coins and five copper coins. You select one coin and then place it back into the bag. Then you select another coin. What is the probability of selecting at least one silver coin?

*Hint:* First find the probability of selecting *no* silver coins!

10. A coin is tossed 4 times. What is the probability of getting at least one tail?

11. Three numbers are chosen at random from the whole numbers between 1 and 10 with replacement. Find the probability that at least one of the numbers is an even number.

*Hint:* First find the probability of no even numbers and then use the law of complements for probability.