Probability Practice Day 10

1. A coin is flipped three times. James is declared the winner if there are at least 2 tails. Peter is declared the winner if there is a head flipped.

   a. How many different outcomes are there?
   b. What is the probability that James wins?
   c. What is the probability that Peter wins?
   d. Is the game fair?
   e. Are there any outcomes where the game would be tied?
   f. Are there any outcomes where no one would win?
   g. Can you come up with a similar game that would never result in a tie and be fair at the same time?

2. An 8-sided die is rolled and a coin is flipped. Christine gets to pick the movie that her and her boyfriend go to if the die is rolled as less than a 4 and the coin is flipped as a tail. If this does not occur, her boyfriend picks the movie. Who likely came up with this game? Why?

3. You randomly draw a marble from a bag containing 2 red marbles and 5 green marbles. You keep the marble and then draw a second marble. What is the probability the first marble is red and the second marble is green?

4.

	Fiction	Non-Fiction	Total
Book for Teens	20	30	50
Book for Adults	10	15	25
Total	30	45	75

Suppose you pick a book at random. Find the probability of each of the following:

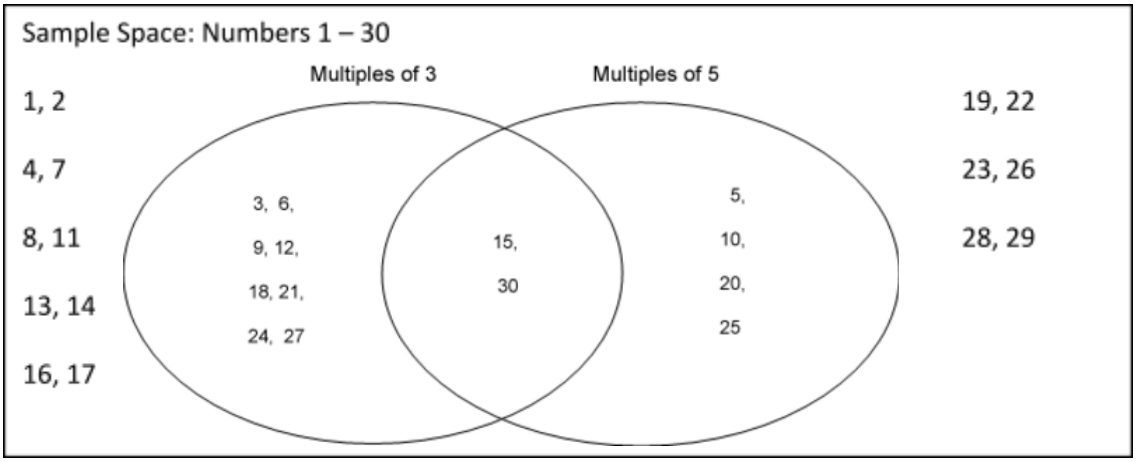
- Find P(Fiction)
- Find P(Book for Adults)
- Find P(Fiction and Book for Adults)
- Find P(Fiction or Book for Adults)
- Find P(Book for Adults | Fiction)
- Find P(Fiction | Book for Adults)

Decide whether the events are independent or dependent. Explain.

5. Tossing a fair coin four times, getting four heads, and tossing it a fifth time and getting a head.

6. Getting high grades and being awarded an academic scholarship.

7. *Let A be multiples of 3, and let B be multiples of 5. Find the following:*



a) A U B
b) $A \cap B$
c) A^c
d) P(A or B)
e) P(A and B)
f) P(not A)

8. Suppose you draw one card from a shuffled standard deck of cards.

   a. Find the following probabilities.

   - *P(card is an ace)*
   - *P(card is a heart)*
   - *P(card is an ace | card is a heart)*
   - *P(card is a heart | card is an ace)*
   - *P(card is an ace* and *card is a heart)*