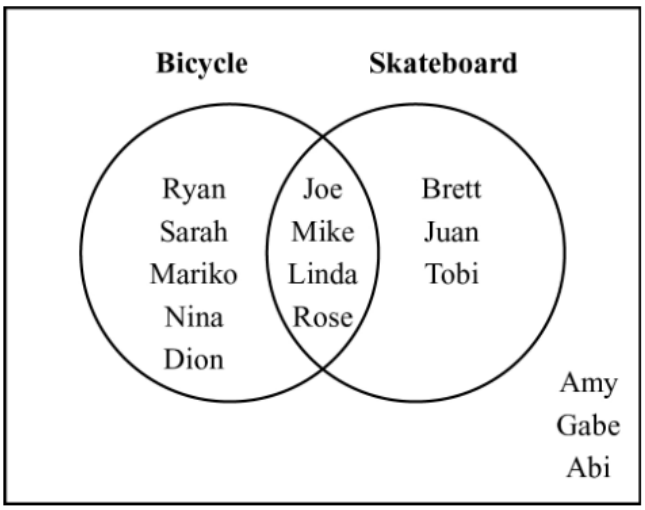
Geometry **Name**_____
Probability Review

1. In the Venn diagram below, let set *A* be the names of students who own bicycles, and let set *B* be the names of students who own skateboards.



a. Find $A \cap B$. What does the set represent?

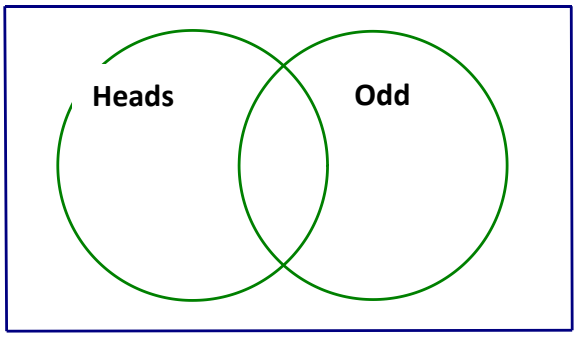
b. Find $A \cup B$. What does the set represent?

c. Find $(A \cup B)'$. What does the set represent?

2. You flip a coin and roll a die at the same time.

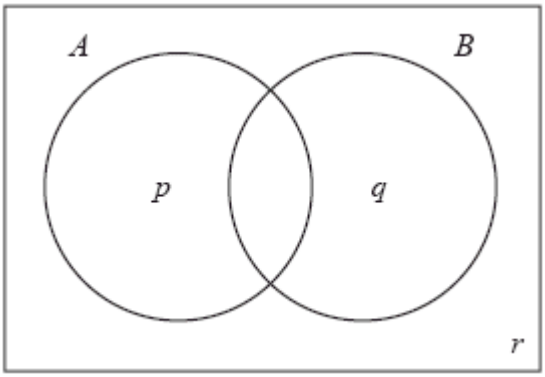
a. List the sample space below (all possible outcomes)

b. Create a Venn diagram with the sample space above using the outcomes of heads and odd.



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

3. Consider the events *A* and *B*, where $P(A) = 0.5$, $P(B) = 0.7$ and $P(A \cap B) = 0.3$. The Venn diagram below shows the events *A* and *B*, and the probabilities *p*, *q* and *r*.



Write down the value of

a. *p*

b. *q*

c. *r*

4. Complete the lattice diagram, which represents the **sample space** for the two dice thrown.

Dice Lattice

(1,1)	(1,2)	(1,3)	(,)	(,)	(,)
(2,1)	(,)	(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)	(,)	(,)

a. Explain why there are 36 outcomes.

b. Using your lattice, find the probability that the sum of two die rolled will be 6.

c. Using your lattice, find the probability that the sum of two die rolled will be a multiple of five.

5. Assume that the following events are independent:

- The probability that a high school senior eats breakfast is 0.8.
- The probability that a high school senior will eat breakfast and get over 6 hours of sleep is 0.2.

What is the probability that a high school senior will get over 6 hours of sleep, **given** that the person ate breakfast?

6. Assume Set A and Set B are **independent**. Find the missing value. Show all work.
Given P(A)= 0.8 and P(A ∩ B)= 0.34, find P(B)= _____

7. A survey at a local college asked a random sample of faculty and a random sample of students the color of the car that they would like to drive. The results are given in the table.

	Faculty	**Student**	**Total**
Silver	40	10	
Black	20	147	
Red	35	86	
Other	25	17	
Total			

a. If a person is chosen at random from all those surveyed, what is the probability that they would like a black car?

b. Given that a randomly selected person is a faculty member, what is the probability that they would like a silver or red car?

c. What is the probability that a person would like a red car or is a student?

d. Are the events "faculty member" and "black car" independent? Justify your answer.

8. Use the table below to answer the following questions:

Employment Survey Results

	Age (in Years)	
Employment Status	**Less than 18**	**18 or greater**
Has Job	20	587
Does Not Have Job	245	92

a. What is the probability that a randomly selected person does not have a job and is less than 18 years old?

b. What is the probability that a randomly selected person is less than 18 years old, given that the person has a job?

c. What is the probability that a randomly selected person is greater than or equal to 18 years old, given that the person has a job?

d. Is a person who has a job more likely to be less than 18 years old or greater than or equal to 18 years old? Why?

e. Are having a job (*A*) and being 18 or greater (*B*) independent events? Justify your answer by showing all work.

9. There are 6 Milky Way, 5 Snickers, and 3 Laffy Taffy in a bag.

a) What is the probability of choosing a Milky Way and a Snickers if there is no replacement?

b) What is the probability of choosing a Snicker and a Laffy Taffy if there is no replacement?

c) What is the probability of choosing 2 Laffy Taffy if there is no replacement?