

Probability and Set Theory

For Problems 1–6, write each statement in set notation. Use the descriptions of the sets to the right to complete each statement.

1. the intersection of sets A and B

2. the complement of set A

3. the union of sets A and B _____

4. the complement of set B _____

5. the number of elements in set A _____

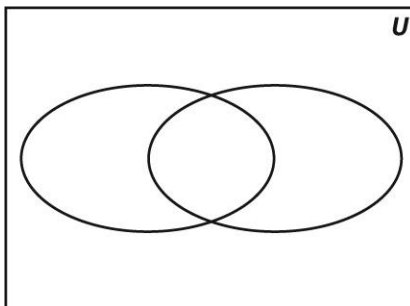
6. the number of elements in set B _____

7. Define set C so that C is a subset of set A . _____

8. Define set D so that D is a subset of set B . _____

9. Create a Venn diagram to represent sets A , B , and U .

$A =$	$\{21, 23, 25, 27, 29\}$
$B =$	$\{21, 24, 27, 30\}$
$U =$	$\{20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30\}$



Refer to the descriptions of the sets above and the Venn diagram to find the probabilities in Problems 11–14.

10. What is the probability that a number in U is *not* in A ? _____

11. What is the probability that a number in U is in $A \cup B$? _____

12. What is the probability that a number in U is *not* in A or B ? _____

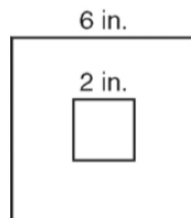
Theoretical Probability

Answer each question.

- How many possible outcomes are there from tossing two number cubes labeled 1–6?
- Describe the sample space for a spinner with four equal sections of blue, red, green, and yellow.
- How likely is it that an outcome with a probability of 1 will occur?
- How likely is it that an outcome with a probability of 0 will occur?

Solve.

- A farmer has four sheepdogs and three beagles. If he randomly chooses a dog to accompany him on a walk, what is the probability of him taking a walk with a sheepdog?
- Gordon spins a spinner with equal-sized sections numbered 1–6. In one spin, what is the likelihood that the spinner will stop on a 1 or a 5?
- Oak trees shade 30% of the Fitzgeralds' backyard. What is the probability that someone standing at a random point in the backyard will NOT be in the shade?
- Find the probability that a point chosen at random inside the larger square shown here will also fall inside the smaller square.



The table below shows the results of pulling one marble from a bag of marbles, recording its color, and replacing it in the bag.

Marble Color	Yellow	Red	Green
Times Pulled	53	17	30

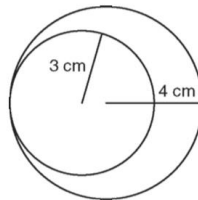
Find the experimental probability of each event.

- Choosing a yellow marble
- NOT choosing a red marble
- Choosing either a red or a green marble
- Which color marble is probably present in greatest number in the bag?

Theoretical Probability

Solve.

1. A fruit bowl contains 4 green apples and 7 red apples. What is the probability that a randomly selected apple will be green?
2. When two number cubes labeled 1–6 are rolled, what is the probability that the result will be two 4's?
3. Joanne is guessing which day in November is Bess's birthday. Joanne knows that Bess's birthday does not fall on an odd-numbered day. What is the probability that Joanne will guess the correct day on her first try?
4. Tom has a dollar's worth of dimes and a dollar's worth of nickels in his pocket.
 - a. What is the probability he will randomly select a nickel from his pocket?
 - b. What is the probability he will randomly select a dime from his pocket?
5. Clarice has 7 new CDs; 3 are classical music and the rest are pop music. If she randomly grabs 3 CDs to listen to in the car on her way to school, what is the probability that she will select only classical music?
6. Find the probability that a point chosen at random inside the larger circle shown here will also fall inside the smaller circle.



Frank is playing darts. The results of his throws are shown in the table below. Assume that his results continue to follow this trend.

Color Hit	Number of Throws
Blue	12
Red	5
White	2

Find the experimental probability of each event.

7. Frank's next throw will hit white.
8. Frank's next throw will hit blue.
9. Frank's next throw will hit either red or white.
10. Frank's next throw will NOT hit red.