

NAME: _____

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PROBABILITY

PERIOD: _____

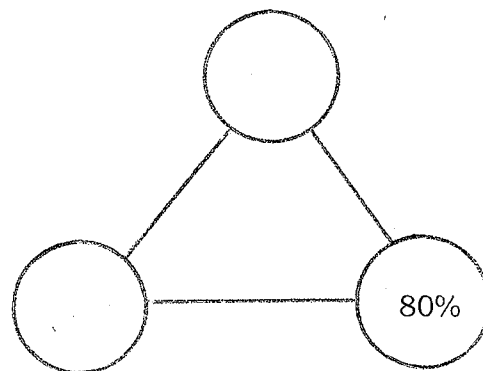
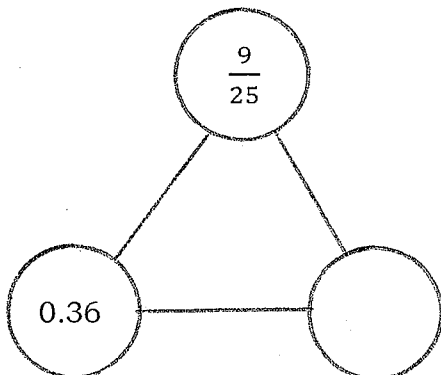
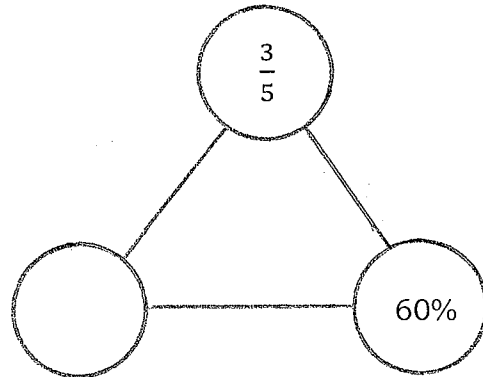
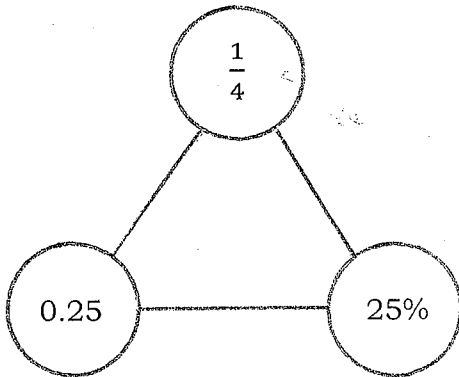
Do Now!
(Topic #2)

1. Define Probability: _____

Example: Peter has a blue, a black, and a red pen in his schoolbag. The probability that he will pull a blue pen out of his schoolbag is _____.

Equivalent rational numbers are numbers that have the same value. For example, three-fourths is equivalent to 0.75 or 75%.

A probability can be expressed as a fraction, decimal, or percent. For each rational number, write the missing equivalent values. Write fractions in *simplest form*.



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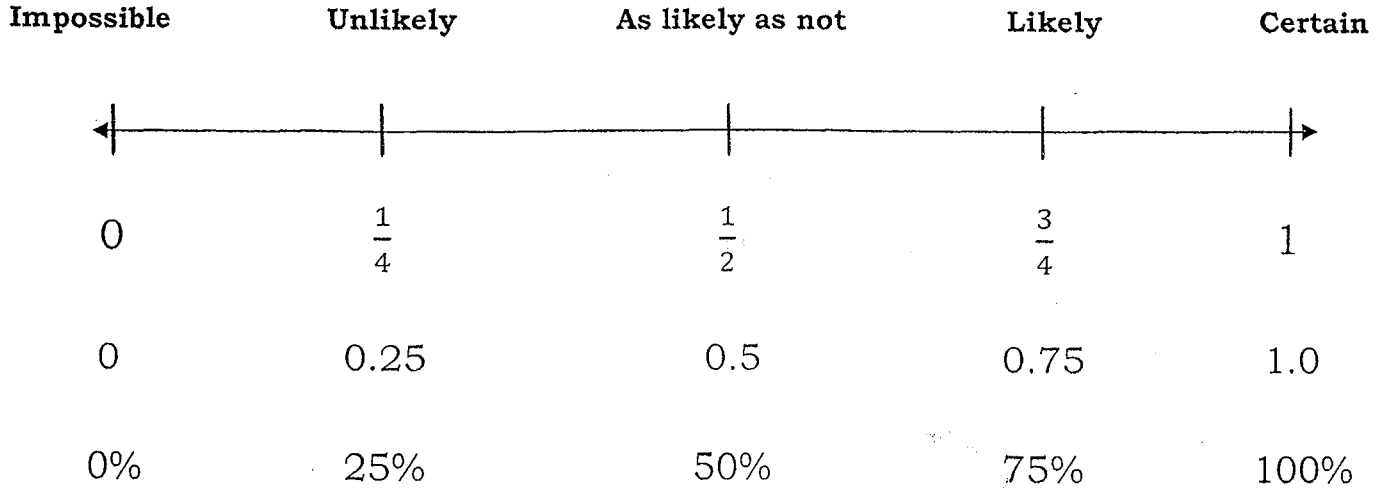
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How Can You Describe the Likelihood of an Event?

(Topic #2)

The **probability** of an event, written $P(\text{event})$, is the measure of how likely the event is to occur.

Probability is a measure between 0 and 1, as shown on the number line below. The closer the probability of an event is to 1, the more likely it is that the event will occur. You can write probability as a *fraction*, a *decimal*, or a *percent*.



Determine whether each event is impossible, unlikely, as likely as not, likely, or certain.

1. rolling an odd number on a number cube _____

2. rolling a number less than 2 on a number cube _____

3. picking a card with a vowel on it from a box of cards
in which each letter of the alphabet is written on a card _____

4. spinning a number greater than 2 on a spinner with
10 equal sections marked 1 through 10 _____

5. drawing a red marble from a bag of black, blue, and
green marbles _____

6. rolling a number that is less than three 5 times in a
row on a number cube labeled 1 through 6 _____

The **complement** of an event is the set of all outcomes that are *not* the event.

Because it is certain that either an event or its complement will occur when an activity is performed, the sum of the probabilities is 1.

$$P(\text{event}) + P(\text{complement}) = 1$$

7. A bag contains 3 green marbles, 7 blue marbles, and 2 black marbles. The probability of randomly picking a green marble is $\frac{1}{4}$. What is the probability of *not* picking a green marble?

8. A spinner has 8 equal sections labeled 1 through 8. The probability of spinning a number that is greater than or equal to 6 is $\frac{3}{8}$. What is the probability of spinning a number that is *not* greater than or equal to 6?

9. The probability of randomly drawing a red card from a bag that contains red, blue, and green cards is $\frac{3}{10}$. What is the probability of *not* drawing a red card?

10. Carrie almost always spends at least 45 minutes on the treadmill. If Carrie got on the treadmill at 5:20 P.M., estimate the probability that she will still be on the treadmill at 6:00?

11. Morris rarely arrives home before 4:00 P.M. It is now 3:20 P.M. Estimate the probability that Morris will arrive home in the next 30 minutes.

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HOMEWORK - (Topic #2)

Describing the Likelihood of an Event

The probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Greater numbers indicate greater likelihood. A probability near 0 indicates an *unlikely event*, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a *likely event*.

Probability can be written as a fraction, decimal, or percent.

Find the probability of each event. Write each answer as a fraction, percent, and decimal. Determine whether each event is impossible, unlikely, as likely as not, likely, or certain.

1. Selection of a white ball from a box with 5 white balls, 8 red balls, and 10 yellow balls.	
2. Selection of a black card from a deck of cards.	
3. Occurrence of an even number when a die is rolled.	
4. Selection of red marble from a box with 12 red marbles.	
5. Selection of red marble from a box with 12 white balls.	

6. Selecting a boy for a field trip from a group of 35 students with 12 girls.	
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The *complement* of an event is the set of all outcomes that are *not* the event.

7. There are 6 equally likely outcomes if a number cube with sides labeled 1 through 6 is rolled. Find the probability of *not* rolling a 6. Write as a fraction, percent, and decimal.

8. A bag contains 5 blue, 8 red, and 7 green marbles. A marble is selected at random. Find the probability the marble is *not* red. Write as a fraction, percent, and decimal.

9. Mr. Harada surveyed his class and discovered that 30% of his students have blue eyes. Identify the complement of this event. Then find its probability. Write as a fraction, percent, and decimal.

10. Of the students at Grant Middle School, 63% are girls. The school newspaper is randomly selecting a student to be interviewed. Describe the complement of selecting a girl and find the probability of the complement. Write the answer as a fraction, percent, and decimal.

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Do Now!
(Topic #2)

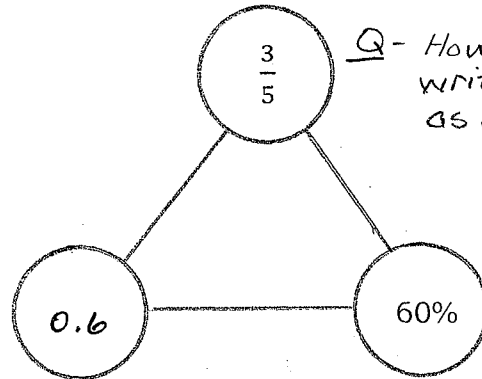
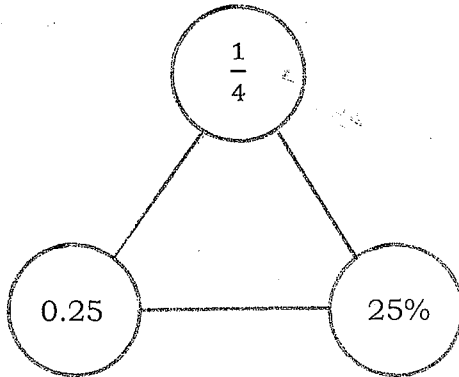
1. Define Probability: the chance that an event will happen. It is the ratio of the # of favorable outcomes to the total # of possible outcomes.

Example: Peter has a blue, a black, and a red pen in his schoolbag. The probability that he will pull a blue pen out of his schoolbag is $\frac{1}{3}$. $\frac{\# \text{ OF FAVORABLE OUT.}}{\text{TOTAL \# POSS. OUTCOMES}}$

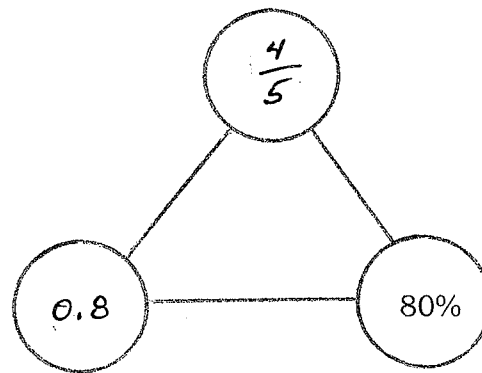
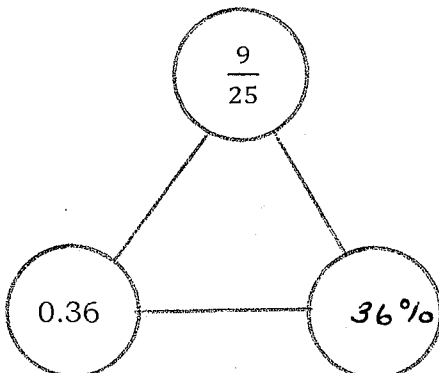
Equivalent rational numbers are numbers that have the same value. For example, three-fourths is equivalent to 0.75 or 75%.

A probability can be expressed as a fraction, decimal, or percent. For each rational number, write the missing equivalent values. Write fractions in *simplest form*.

Q- How do you write a fraction as a decimal?



Q- How do you write a decimal as a %?



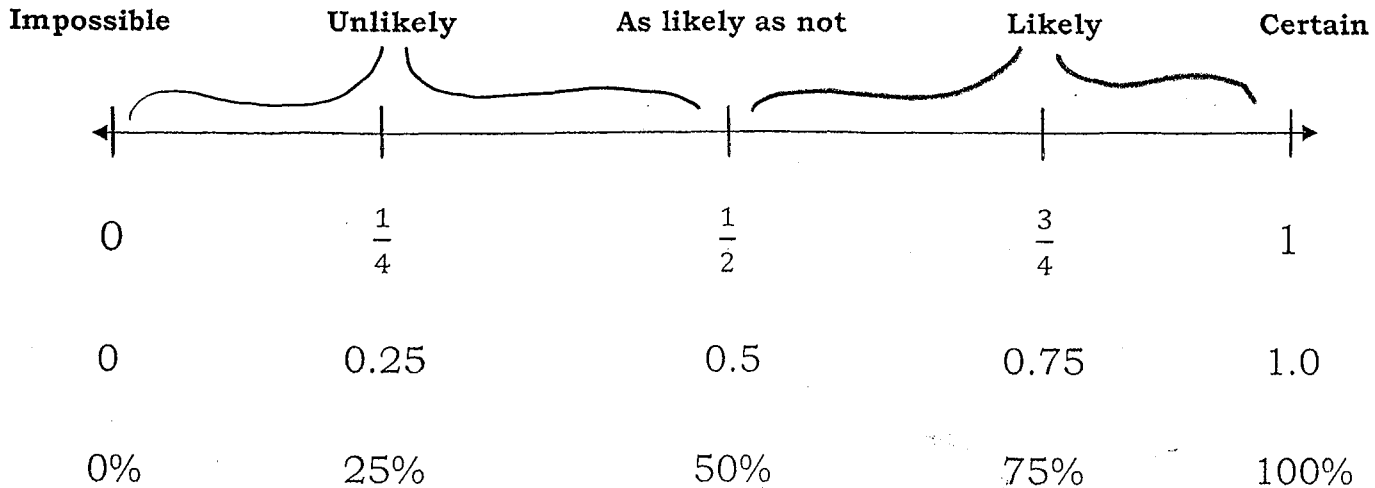
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How Can You Describe the Likelihood of an Event?
 (Topic #2)

The **probability** of an event, written $P(\text{event})$, is the measure of how likely the event is to occur.

Probability is a measure between 0 and 1, as shown on the number line below. The closer the probability of an event is to 1, the more likely it is that the event will occur. You can write probability as a *fraction*, a *decimal*, or a *percent*.



Determine whether each event is impossible, unlikely, as likely as not, likely, or certain.

1. rolling an odd number on a number cube

$$\frac{3}{6} = \frac{1}{2} = 0.5$$

as likely as not

2. rolling a number less than 2 on a number cube

$$\frac{1}{6} = 0.1\bar{6}$$

unlikely

3. picking a card with a vowel on it from a box of cards in which each letter of the alphabet is written on a card

$$\frac{5}{26} = 0.1923076\dots$$

unlikely

4. spinning a number greater than 2 on a spinner with 10 equal sections marked 1 through 10

$$\frac{8}{10} = \frac{4}{5} = 0.8$$

likely

5. drawing a red marble from a bag of black, blue, and green marbles

$$\frac{0}{3} = 0$$

impossible

6. rolling a number that is less than three 5 times in a row on a number cube labeled 1 through 6

$$\frac{2}{6} = \frac{1}{3} = 0.\bar{3}$$

unlikely

The **complement** of an event is the set of all outcomes that are *not* the event.

Because it is certain that either an event or its complement will occur when an activity is performed, the sum of the probabilities is 1.

$$P(\text{event}) + P(\text{complement}) = 1$$

7. A bag contains 3 green marbles, 7 blue marbles, and 2 black marbles. The probability of randomly picking a green marble is $\frac{1}{4}$. What is the probability of *not* picking a green marble?

$$\frac{3}{4}$$

8. A spinner has 8 equal sections labeled 1 through 8. The probability of spinning a number that is greater than or equal to 6 is $\frac{3}{8}$. What is the probability of spinning a number that is *not* greater than or equal to 6?

$$\frac{5}{8}$$

9. The probability of randomly drawing a red card from a bag that contains red, blue, and green cards is $\frac{3}{10}$. What is the probability of *not* drawing a red card?

$$\frac{7}{10}$$

10. Carrie almost always spends at least 45 minutes on the treadmill. If Carrie got on the treadmill at 5:20 P.M., estimate the probability that she will still be on the treadmill at 6:00?

likely

11. Morris rarely arrives home before 4:00 P.M. It is now 3:20 P.M. Estimate the probability that Morris will arrive home in the next 30 minutes.

unlikely

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HOMEWORK - (Topic #2)**Describing the Likelihood of an Event**

The probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Greater numbers indicate greater likelihood. A probability near 0 indicates an *unlikely event*, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a *likely event*.

Probability can be written as a fraction, decimal, or percent.

Find the probability of each event. Write each answer as a fraction, percent, and decimal. Determine whether each event is impossible, unlikely, as likely as not, likely, or certain.

1. Selection of a white ball from a box with 5 white balls, 8 red balls, and 10 yellow balls.	$P(\text{white}) = \frac{5}{23}$ 0.217391304 22% <p style="text-align: right;"><i>unlikely</i></p>
2. Selection of a black card from a deck of cards.	$P(\text{black}) = \frac{1}{2}$ 0.5 50% <p style="text-align: right;"><i>as likely as not</i></p>
3. Occurrence of an even number when a die is rolled.	$P(\text{even}) = \frac{1}{2}$ 0.5 50% <p style="text-align: right;"><i>as likely as not</i></p>
4. Selection of red marble from a box with 12 red marbles.	$P(\text{red}) = \frac{12}{12}$ 1 100% <p style="text-align: right;"><i>certain</i></p>
5. Selection of red marble from a box with 12 white balls.	$P(\text{red}) = \frac{0}{12}$ 0 0% <p style="text-align: right;"><i>impossible</i></p>

6. Selecting a boy for a field trip from a group of 35 students with 12 girls.

$$35 - 12 = 23 \text{ boys}$$

$$P(\text{boy}) = \frac{23}{35}$$

$$0.657142857$$

$$66\%$$

likely

The *complement* of an event is the set of all outcomes that are *not* the event.

7. There are 6 equally likely outcomes if a number cube with sides labeled 1 through 6 is rolled. Find the probability of *not* rolling a 6. Write as a fraction, percent, and decimal.

$$P(\text{not a 6}) = \frac{5}{6} = 0.\overline{83} = 83.\overline{3}\%$$

8. A bag contains 5 blue, 8 red, and 7 green marbles. A marble is selected at random. Find the probability the marble is *not* red. Write as a fraction, percent, and decimal.

$$P(\text{not red}) = \frac{12}{20} = \frac{3}{5} = 0.6 = 60\%$$

9. Mr. Harada surveyed his class and discovered that 30% of his students have blue eyes. Identify the complement of this event. Then find its probability. Write as a fraction, percent, and decimal.

$$P(\text{not blue eyes}) = 70\%, 0.7 = \frac{7}{10}$$

10. Of the students at Grant Middle School, 63% are girls. The school newspaper is randomly selecting a student to be interviewed. Describe the complement of selecting a girl and find the probability of the complement. Write the answer as a fraction, percent, and decimal.

$$P(\text{selecting not a girl}) = 37\%, 0.37, \frac{37}{100}$$