Grade 6 – Accelerated Math Summer Work Packet

In order to be prepared for the accelerated program, you will need to review and complete the following math packet. There are three focus areas: Online Video Support; Paper Packet and Freckle. A computer or smart device with internet access will be required for the online video support and Freckle.

START HERE First, use this packet as a guide to start exploring these topics. Use the paper packet to learn more about the topic. Try to answer the questions in the packet. Use the online support link for help.

Next, you will be required to complete online assignments in Freckle. They will be assigned to you for completion. You will need a username and password.

Name of Unit	Section	Assignment	Complete
Positive and Negative Numbers in the Real World (Integers)	**1.1 Identifying Integers and Their Opposites**		
	Online Video Support:	https://bit.ly/2VrW6FW	
	Paper Packet:	Practice pages 5-10 Number Line Integers WS	
	Freckle:	Negative Numbers Opposite Signs of Numbers	
	1.2 Comparing and Ordering Integers		
	Online Video Support:	https://bit.ly/2J6JvRN https://bit.ly/2Jn83W4	
	Paper Packet:	Practice pages 13-16 Comparing Integers WS Ordering Integers WS	
	Freckle:	Placing Numbers on a Number Line	
	1.3 Absolute Value		
	Online Video Support:	https://bit.ly/2Ya0xSz https://bit.ly/2YbtjCf	
	Paper Packet:	Practice pages 19-22 Absolute Value WS	
	Freckle:	Absolute Value	
	Review Paper Packet:	Practice pages 25-26	

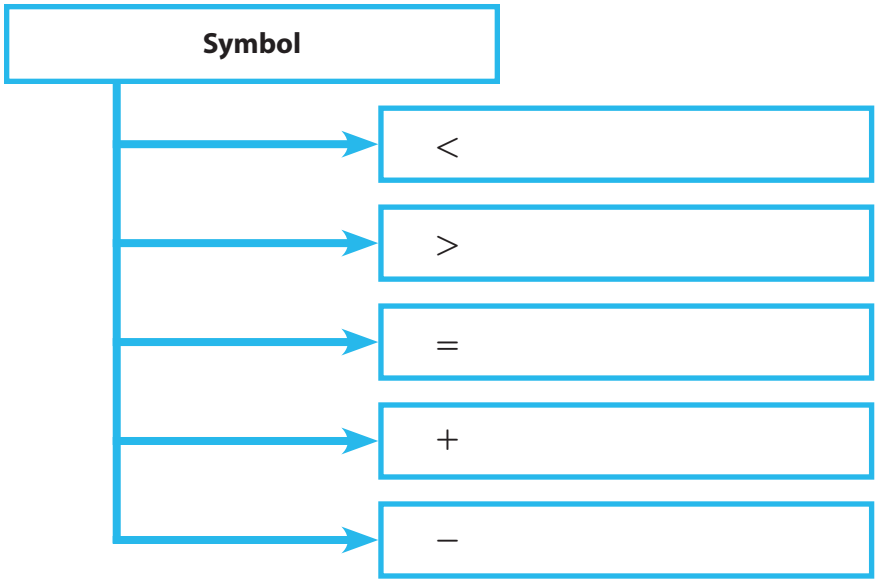
Name of Unit	Section	Assignment	Complete
Rational Numbers	**3.1 Classifying Rational Numbers**		
	Online Video Support:	http://bit.ly/30A9SVP http://bit.ly/30ElJ5d	
	Paper Packet:	Practice pages 45-50	
	3.2 Identifying Opposites and Absolute Value of Rational Numbers		
	Online Video Support:	http://bit.ly/30Bv1Pv http://bit.ly/30EbH48	
	Paper Packet:	Practice pages 53-56	
	Freckle:	Comparisons of Absolute Value	
	3.3 Comparing and Ordering Rational Numbers		
	Online Video Support:	http://bit.ly/30Dw9C5 http://bit.ly/30GefPa	
	Paper Packet:	Practice pages 59-62	
	Freckle:	Comparing Numbers on a Number Line Statements of Order	
	Review		
	Paper Packet:	Practice pages 65-66	

Name of Unit	Section	Assignment	Complete
Coordinate Plane	**12.1 Graphing on the Coordinate Plane**		
	Online Video Support:	http://bit.ly/2VPA2Ao http://bit.ly/2VPAheM http://bit.ly/2VK0HhC	
	Paper Packet:	Practice pages 331-334 Four Quadrant Ordered Pairs WS	
	Freckle:	Coordinate Plane Points in a Coordinate Plane Graphing Points in a Coordinate Plane	
	14.1 Distance in the Coordinate Plane		
	Online Video Support:	http://bit.ly/2VJrOtp http://bit.ly/2VJEssj	
	Paper Packet:	Practice pages 401-404	
	14.2 Polygons in the Coordinate Plane		
	Online Video Support:	http://bit.ly/2VPDkDK http://bit.ly/2VLxGT1	
	Paper Packet:	Practice pages 407-410 Plotting Points – Shapes WS	
	Freckle:	Polygons in a Coordinate Plane	
	Review		
	Paper Packet:	Practice pages 413-414	

Reading Start-Up

Visualize Vocabulary

Use the ✔ words to complete the chart. Write the correct vocabulary word next to the symbol.



Understand Vocabulary

Complete the sentences using the preview words.

1. An _____ is a statement that two quantities are not equal.
2. The set of all whole numbers and their opposites are _____.
3. Numbers greater than 0 are _____. Numbers less than 0 are _____.

Vocabulary

Review Words

- ✔ equal *(igual)*
- ✔ greater than *(más que)*
- ✔ less than *(menos que)*
- ✔ negative sign *(signo negativo)*
- number line *(recta numérica)*
- ✔ plus sign *(signo más)*
- symbol *(símbolo)*
- whole number *(número entero)*

Preview Words

- absolute value *(valor absoluto)*
- inequality *(desigualdad)*
- integers *(enteros)*
- negative numbers *(números negativos)*
- opposites *(opuestos)*
- positive numbers *(números positivos)*

Active Reading

Key-Term Fold Before beginning the module, create a key-term fold to help you learn the vocabulary in this module. Write the highlighted vocabulary words on one side of the flap. Write the definition for each word on the other side of the flap. Use the key-term fold to quiz yourself on the definitions in this module.

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MODULE 1

Unpacking the Standards

Understanding the standards and the vocabulary terms in the standards will help you know exactly what you are expected to learn in this module.

COMMON CORE 6.NS.6a

Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.

Key Vocabulary

Integers *(entero)*
The set of all whole numbers and their opposites.

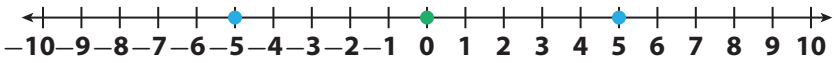
opposites *(opuestos)*
Two numbers that are equal distance from zero on a number line.

What It Means to You

You will learn that opposites are the same distance from 0 on a number line but in different directions.

UNPACKING EXAMPLE 6.NS.6A

Use the number line to determine the opposites.



$-(5) = -5$ *The opposite of 5 is −5.*

$-(-5) = 5$ *The opposite of −5 is 5.*

$-(0) = 0$ *The opposite of 0 is 0.*

COMMON CORE 6.NS.7

Understand ordering and absolute value of rational numbers.

Key Vocabulary

absolute value *(valor absoluto)*
A number's distance from 0 on the number line.

rational number *(número racional)*
Any number that can be expressed as a ratio of two integers.

What It Means to You

You can use a number line to order rational numbers.

UNPACKING EXAMPLE 6.NS.7

At a golf tournament, David scored +6, Celia scored −16, and Xavier scored −4. One of these three players was the winner of the tournament. Who won the tournament?

The winner will be the player with the lowest score. Draw a number line and graph each player's score.

Celia's score, −16, is the farthest to the left, so it is the lowest score. Celia won the tournament.

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LESSON 1.1

Identifying Integers and Their Opposites

COMMON CORE **6.NS.5**

Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. . . . *Also 6.NS.6, 6.NS.6a, 6.NS.6c*

ESSENTIAL QUESTION

How do you identify an integer and its opposite?

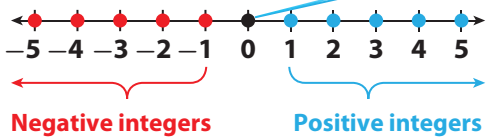
EXPLORE ACTIVITY 1 Real World

COMMON CORE **6.NS.5, 6.NS.6**

Positive and Negative Numbers

Positive numbers are numbers greater than 0. Positive numbers can be written with or without a plus sign; for example, 3 is the same as +3. **Negative numbers** are numbers less than 0. Negative numbers must always be written with a negative sign.

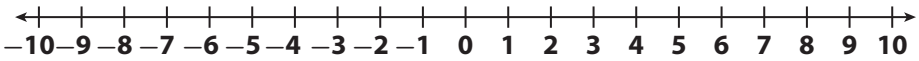
The number 0 is neither positive nor negative.



The elevation of a location describes its height above or below sea level, which has elevation 0. Elevations below sea level are represented by negative numbers, and elevations above sea level are represented by positive numbers.

A The table shows the elevations of several locations in a state park. Graph the locations on the number line according to their elevations.

Location	Little Butte *A*	Cradle Creek *B*	Dinosaur Valley *C*	Mesa Ridge *D*	Juniper Trail *E*
Elevation (ft)	5	−5	−9	8	−3



B What point on the number line represents sea level? _____

C Which location is closest to sea level? How do you know?

_____

D Which two locations are the same distance from sea level? Are these locations above or below sea level?

_____

E Which location has the least elevation? How do you know?

_____

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EXPLORE ACTIVITY *(cont'd)*

Reflect

1. **Analyze Relationships** Morning Glory Stream is 7 feet below sea level. What number represents the elevation of Morning Glory Stream?

_____

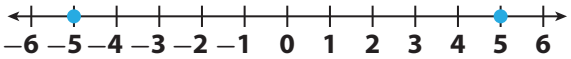
2. **Multiple Representations** Explain how to graph the elevation of Morning Glory Stream on a number line.

_____

EXPLORE ACTIVITY 2 COMMON CORE 6.NS.6a

Opposites

Two numbers are **opposites** if, on a number line, they are the same distance from 0 but on different sides of 0. For example, 5 and −5 are opposites. 0 is its own opposite.



Integers are the set of all whole numbers and their opposites.

Remember, the set of whole numbers is 0, 1, 2, 3, 4, 5, 6, ...

On graph paper, use a ruler or straightedge to draw a number line. Label the number line with each integer from −10 to 10. Fold your number line in half so that the crease goes through 0. Numbers that line up after folding the number line are opposites.

A Use your number line to find the opposites of 7, −6, 1, and 9. _____

B How does your number line show that 0 is its own opposite?

_____

C What is the opposite of the opposite of 3? _____

Reflect

3. **Justify Reasoning** Explain how your number line shows that 8 and −8 are opposites.

_____

4. **Multiple Representations** Explain how to use your number line to find the opposite of the opposite of −6.

_____

_____

_____

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Integers and Opposites on a Number Line

Positive and negative numbers can be used to represent real-world quantities. For example, 3 can represent a temperature that is 3 °F above 0. −3 can represent a temperature that is 3 °F below 0. Both 3 and −3 are 3 units from 0.

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My Notes

EXAMPLE 1

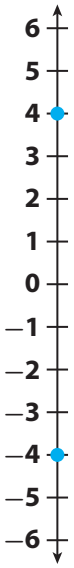
Real World

COMMON CORE 6.NS.6a, 6.NS.6c

Sandy kept track of the weekly low temperature in her town for several weeks. The table shows the low temperature in °F for each week.

Week	Week 1	Week 2	Week 3	Week 4
Temperature (°F)	−1	3	−4	2

A Graph the temperature from Week 3 and its opposite on a number line. What do the numbers represent?



STEP 1 Graph the value from Week 3 on the number line.

The value from Week 3 is −4.
Graph a point 4 units below 0.

STEP 2 Graph the opposite of −4.

Graph a point 4 units above 0.

The opposite of −4 is 4.

−4 represents a temperature that is 4 °F below 0 and 4 represents a temperature that is 4 °F above 0.

B The value for Week 5 is the opposite of the opposite of the value from Week 1. What was the low temperature in Week 5?

STEP 1 Graph the value from Week 1 on the number line.

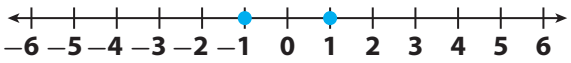
The value from Week 1 is −1.

STEP 2 Graph the opposite of −1.

The opposite of −1 is 1.

STEP 3 Graph the opposite of 1.

The opposite of 1 is −1.



The opposite of the opposite of −1 is −1.
The low temperature in Week 5 was −1 °F.

Reflect

5. **Analyze Relationships** Explain how you can find the opposite of the opposite of any number without using a number line.

_____

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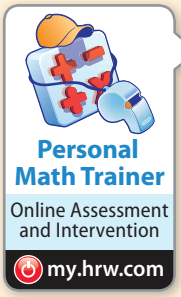
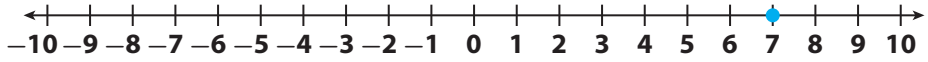


YOUR TURN

Graph the opposite of the number shown on each number line.

6.

7.



Write the opposite of each number.

8. 10 _____ **9.** −5 _____ **10.** 0 _____

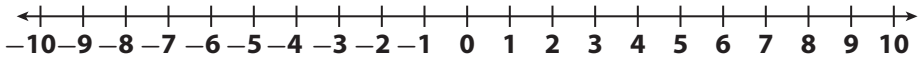
11. What is the opposite of the opposite of 6? _____

Math Talk
Mathematical Practices
Explain how you could use a number line to find the opposite of 8.

Guided Practice

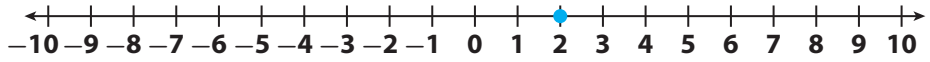
1. Graph and label the following points on the number line. (Explore Activity 1)

a. −2 **b.** 9 **c.** −8 **d.** −9 **e.** 5 **f.** 8

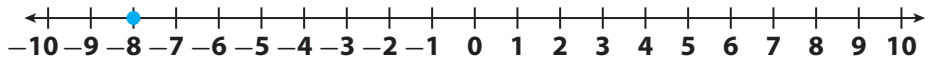


Graph the opposite of the number shown on each number line. (Explore Activity 2 and Example 1)

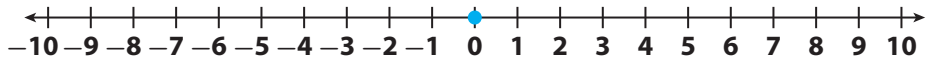
2.



3.



4.



Write the opposite of each number. (Explore Activity 2 and Example 1)

5. 4 _____ **6.** −11 _____ **7.** 3 _____

8. −3 _____ **9.** 0 _____ **10.** 22 _____

ESSENTIAL QUESTION CHECK-IN

11. Given an integer, how do you find its opposite?

_____

_____

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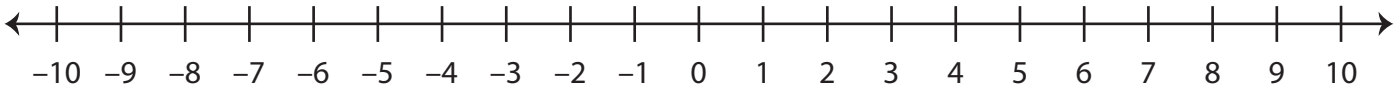
Name : _____ Score : _____

Number Line - Integers

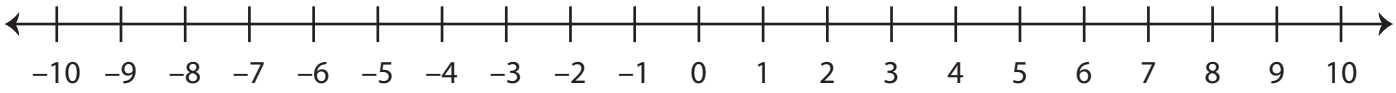
ES1

A) Mark the integers on the number line.

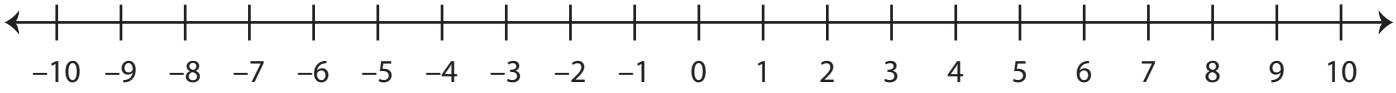
1) a) –2 b) 7 c) –5 d) 1



2) a) 9 b) –4 c) 3 d) –8



B) Answer the questions using the number line below.



1) 2 units to the left of 3 is _____

2) 6 units to the right of –1 is _____

3) 4 units to the left of –4 is _____

4) 3 units to the right of 7 is _____

5) 1 unit to the left of 10 is _____

6) 5 units to the right of –6 is _____

7) 8 units to the left of 5 is _____

LESSON 1.2

Comparing and Ordering Integers

COMMON CORE **6.NS.7b**

Write, interpret, and explain statements of order for rational numbers in real-world contexts. *Also 6.NS.7, 6.NS.7a*

ESSENTIAL QUESTION

How do you compare and order integers?

EXPLORE ACTIVITY Real World

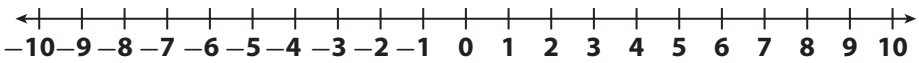
COMMON CORE **6.NS.7, 6.NS.7a**

Comparing Positive and Negative Integers

The Westfield soccer league ranks its teams using a number called the "win/loss combined record." A team with more wins than losses will have a positive combined record, and a team with fewer wins than losses will have a negative combined record. The table shows the total win/loss combined record for each team at the end of the season.

Team	Sharks *A*	Jaguars *B*	Badgers *C*	Tigers *D*	Cougars *E*	Hawks *F*	Wolves *G*
Win/Loss Combined Record	0	4	−4	−6	2	−2	6

A Graph the win/loss combined record for each team on the number line.



B Which team had the best record in the league? How do you know?

_____

C Which team had the worst record? How do you know?

_____

Reflect

1. **Analyze Relationships** Explain what the data tell you about the win/loss records of the teams in the league.

_____

_____

_____

_____

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Ordering Positive and Negative Integers

When you read a number line from left to right, the numbers are in order from least to greatest.

EXAMPLE 1

Real World

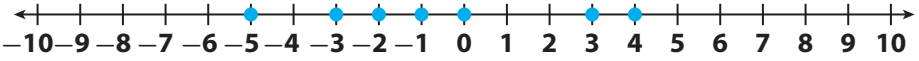
COMMON CORE 6.NS.7

Fred recorded the following golf scores during his first week at the golf academy. In golf, the player with the lowest score wins the game.

Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Score	4	–2	3	–5	–1	0	–3

Graph Fred's scores on the number line, and then list the numbers in order from least to greatest.

STEP 1 Graph the scores on the number line.



STEP 2 Read from left to right to list the scores in order from least to greatest.

The scores listed from least to greatest are –5, –3, –2, –1, 0, 3, 4.

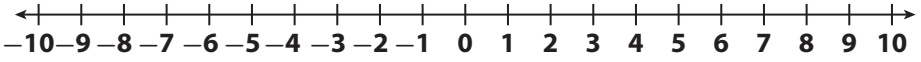
Math Talk
Mathematical Practices
What day did Fred have his best golf score? How do you know?

YOUR TURN

Graph the values in each table on a number line. Then list the numbers in order from greatest to least.

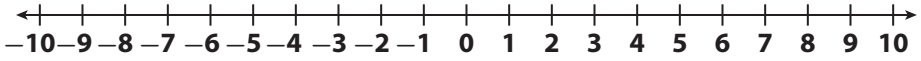
2.

Change in Stock Price ($)					
–5	4	0	–3	–6	2



3.

Elevation (meters)							
9	–1	–6	2	–10	0	5	8



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Writing Inequalities

An **inequality** is a statement that two quantities are not equal. The symbols $<$ and $>$ are used to write inequalities.

- The symbol $>$ means "is greater than."
- The symbol $<$ means "is less than."

You can use a number line to help write an inequality.

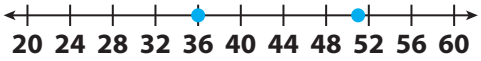
EXAMPLE 2

Real World

COMMON CORE 6.NS.7a, 6.NS.7b

A In 2005, Austin, Texas, received 51 inches in annual precipitation. In 2009, the city received 36 inches in annual precipitation. In which year was there more precipitation?

Graph 51 and 36 on the number line.



- 51 is to the *right* of 36 on the number line.

  This means that 51 is **greater than** 36.

  Write the inequality as $51 > 36$.

- 36 is to the *left* of 51 on the number line.

  This means that 36 is **less than** 51.

  Write the inequality as $36 < 51$.

  There was more precipitation in 2005.

B Write two inequalities to compare -6 and 7.
$-6 < 7; 7 > -6$

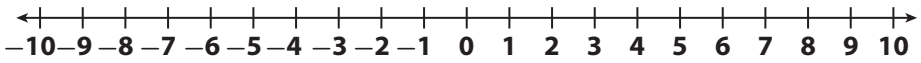
C Write two inequalities to compare -9 and -4.
$-4 > -9; -9 < -4$

Math Talk
Mathematical Practices
Is there a greatest integer? Is there a greatest negative integer? Explain.

YOUR TURN

Compare. Write $>$ or $<$. Use the number line to help you.

4. $-10 \bigcirc -2$ **5.** $-6 \bigcirc 6$ **6.** $-7 \bigcirc -8$



7. Write two inequalities to compare -2 and -18. _____

8. Write two inequalities to compare 39 and -39. _____

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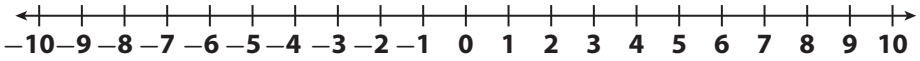
Guided Practice

1a. Graph the temperature for each city on the number line. (Explore Activity)

City	A	B	C	D	E
Temperature (°F)	−9	10	−2	0	4



b. Which city was coldest? _____

c. Which city was warmest? _____

List the numbers in order from least to greatest. (Example 1)

2. 4, −6, 0, 8, −9, 1, −3

_____

3. −65, 34, 7, −13, 55, 62, −7

_____

4. Write two inequalities to compare −17 and −22. _____

Compare. Write < or >. (Example 2)

5. −9 ◯ 2 **6.** 0 ◯ 6 **7.** 3 ◯ −7 **8.** 5 ◯ −10

9. −1 ◯ −3 **10.** −8 ◯ −4 **11.** −4 ◯ 1 **12.** −2 ◯ −6

13. Compare the temperatures for the following cities. Write < or >. (Example 2)

City	Alexandria	Redwood Falls	Grand Marais	Winona	International Falls
Average Temperature in March (°C)	−3	0	−2	2	−4

a. Alexandria and Winona _____

b. Redwood Falls and International Falls _____

ESSENTIAL QUESTION CHECK-IN

14. How can you use a number line to compare and order numbers?

_____

_____

_____

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Name : _____ Score : _____

Comparing Integers

L1S1

Compare each pair of integers using the symbols >, < or =.

1) 13 ☐ 9

2) −2 ☐ −2

3) −1 ☐ 10

4) 17 ☐ −11

5) −14 ☐ −14

6) −8 ☐ 8

7) −7 ☐ 15

8) 0 ☐ −5

9) 19 ☐ −6

10) 16 ☐ 20

11) 12 ☐ 12

12) −3 ☐ −4

13) 6 ☐ −17

14) 18 ☐ 18

15) −16 ☐ −13

16) −19 ☐ 11

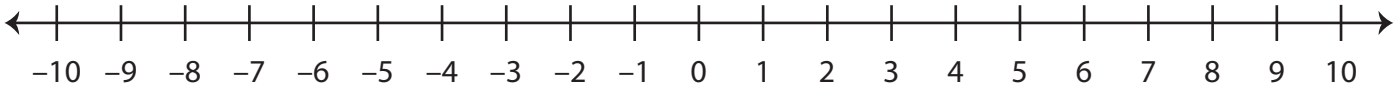
Name : _____ Score : _____

Ordering Integers

Sheet 1

A) Mark the integers on the number line and order them from the least to the greatest.

1) –9, 4, –5, 2



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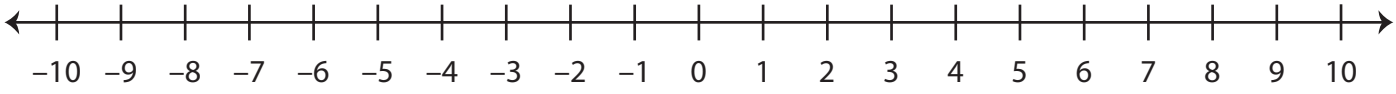
2) 10, 0, –3, –10



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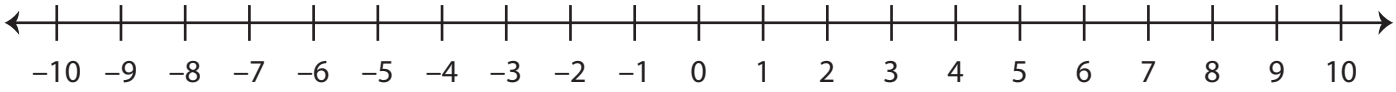
3) –7, 6, –8, 1



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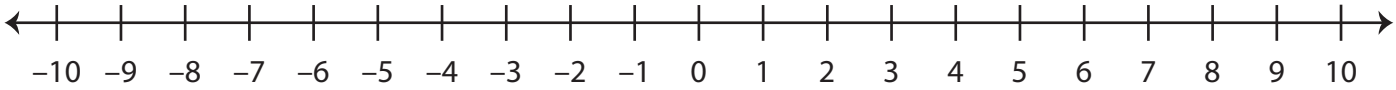
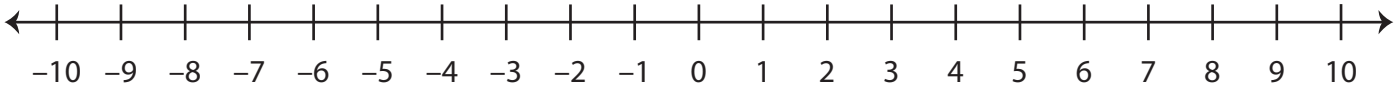
B) Mark the integers on the number line and order them from the greatest to the least.

1) 3, –6, –4, 5



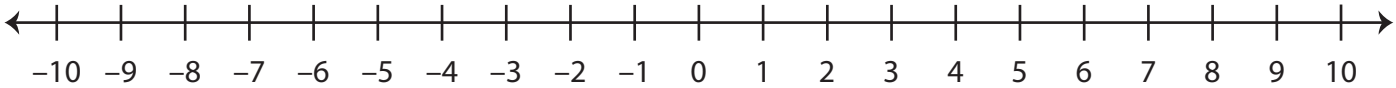
_____

2) –2, –1, 9, –7



_____

3) –5, 7, 8, –9



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LESSON

1.3 Absolute Value

COMMON CORE 6.NS.7c

Understand the absolute value of a rational number… interpret absolute value as magnitude… in a real-world situation. *Also 6.NS.7, 6.NS.7d*

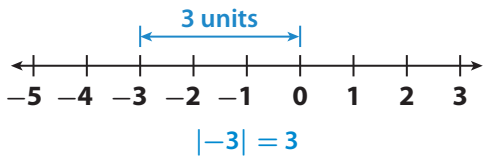
ESSENTIAL QUESTION

How do you find and use absolute value?

EXPLORE ACTIVITY 1 COMMON CORE 6.NS.7, 6.NS.7c

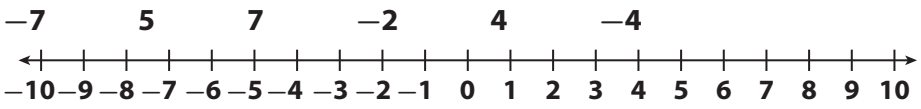
Finding Absolute Value

The **absolute value** of a number is the number's distance from 0 on a number line. For example, the absolute value of −3 is 3 because −3 is 3 units from 0. The absolute value of −3 is written $|-3|$.



Because absolute value represents a distance, it is always nonnegative.

Graph the following numbers on the number line. Then use your number line to find each absolute value.



A $|-7| =$ ____ **B** $|5| =$ ____ **C** $|7| =$ ____

D $|-2| =$ ____ **E** $|4| =$ ____ **F** $|-4| =$ ____

Reflect

1. **Analyze Relationships** Which pairs of numbers have the same absolute value? How are these numbers related?

2. **Justify Reasoning** Negative numbers are less than positive numbers. Does this mean that the absolute value of a negative number must be less than the absolute value of a positive number? Explain.

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Math On the Spot
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Animated Math
my.hrw.com

Absolute Value In A Real-World Situation

In real-world situations, absolute values are often used instead of negative numbers. For example, if you use a $50 gift card to make a $25 purchase, the change in your gift card balance can be represented by −$25.

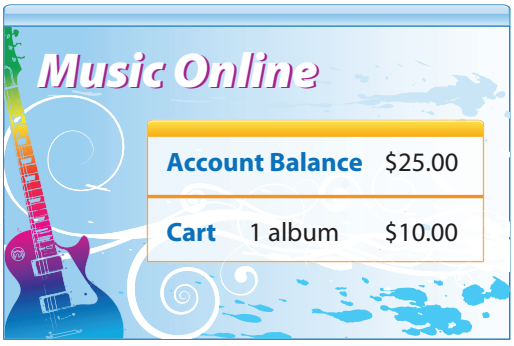
EXAMPLE 1

Real World

COMMON CORE 6.NS.7c

Jake uses his online music store gift card to buy an album of songs by his favorite band.

Find the negative number that represents the change in the balance on Jake's card after his purchase. Explain how absolute value would be used to express that number in this situation.



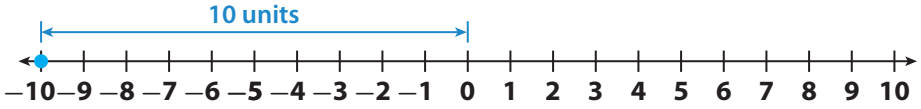
Math Talk
Mathematical Practices
Explain why the price Jake paid for the album is represented by a negative number.

STEP 1 Find the negative integer that represents the change in the balance.

−$10 *The balance decreased by $ 10, so use a negative number.*

STEP 2 Use the number line to find the absolute value of −$10.

−10 is 10 units from 0 on the number line.



The absolute value of −$10 is $10, or $|-10| = 10$.

The balance on Jake's card decreased by $10.

Reflect

3. **Communicate Mathematical Ideas** Explain why the absolute value of a number will never be negative.

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YOUR TURN

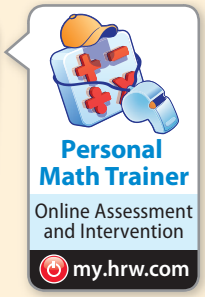
4. The temperature at night reached −13 °F. Write an equivalent statement about the temperature using the absolute value of the number.

_____

Find each absolute value.

5. $|-12|$ _____ **6.** $|91|$ _____ **7.** $|-55|$ _____

8. $|0|$ _____ **9.** $|88|$ _____ **10.** $|1|$ _____



EXPLORE ACTIVITY 2 Real World

COMMON CORE 6.NS.7c, 6.NS.7d

Comparing Absolute Values

You can use absolute values to compare negative numbers in real-world situations.

Maria, Susan, George, and Antonio checked their credit card balances on their smartphones. The amounts owed are shown.

_____ _____ _____ _____

Answer the following questions. When you have finished, you will have enough clues to match each smartphone with the correct person.

Remember: When someone owes a positive amount of money, this means that he or she has a *negative* balance.

A Maria's credit card balance is less than −$30. Does Maria owe more than $30 or less than $30? _____

B Susan's credit card balance is greater than −$25. Does Susan owe more than $25 or less than $25? _____

C George's credit card balance is $5 less than Susan's balance. Does George owe more than Susan or less than Susan? _____

D Antonio owes $15 less than Maria owes. This means that Antonio's balance is _____ than Maria's balance.

E Write each person's name underneath his or her smartphone.

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EXPLORE ACTIVITY 2 *(cont'd)*

Reflect

11. **Analyze Relationships** Use absolute value to describe the relationship between a negative credit card balance and the amount owed.

_____

Guided Practice

1. **Vocabulary** If a number is _____, then the number is less than its absolute value. (Explore Activity 1)

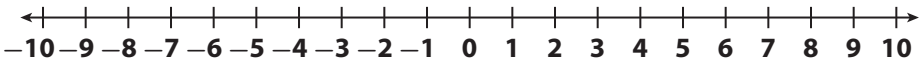
2. If Ryan pays his car insurance for the year in full, he will get a credit of $28. If he chooses to pay a monthly premium, he will pay a $10 late fee for any month that the payment is late. (Explore Activity 1, Example 1)

a. Which of these values could be represented with a negative number? Explain.

_____

_____

b. Use the number line to find the absolute value of your answer from part a. _____



3. Leo, Gabrielle, Sinea, and Tomas are playing a video game. Their scores are described in the table below. (Explore Activity 2)

Name	Leo	Gabrielle	Sinea
Score	less than −100 points	20 more points than Leo	50 points less than Leo

a. Leo wants to earn enough points to have a positive score. Does he need to earn more than 100 points or less than 100 points? _____

b. Gabrielle wants to earn enough points to not have a negative score. Does she need to earn more points than Leo or less points than Leo? _____

c. Sinea wants to earn enough points to have a higher score than Leo. Does she need to earn more than 50 points or less than 50 points? _____

ESSENTIAL QUESTION CHECK-IN

4. When is the absolute value of a number equal to the number?

_____

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Name: _____ **Score:**

Absolute Value

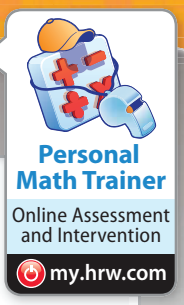
BS1

Find the value:

1) $\lvert 5 \rvert =$	2) $\lvert -13 \rvert =$	3) $\lvert 2 \rvert =$
4) $\lvert -11 \rvert =$	5) $\lvert 7 \rvert =$	6) $\lvert -4 \rvert =$
7) $\lvert 3 \rvert =$	8) $\lvert -14 \rvert =$	9) $\lvert 10 \rvert =$
10) $\lvert -13 \rvert =$	11) $\lvert 1 \rvert =$	12) $\lvert -7 \rvert =$
13) $\lvert 9 \rvert =$	14) $\lvert -5 \rvert =$	15) $\lvert 11 \rvert =$
16) $\lvert -7 \rvert =$	17) $\lvert 8 \rvert =$	18) $\lvert -15 \rvert =$
19) $\lvert 2 \rvert =$	20) $\lvert -9 \rvert =$	21) $\lvert 4 \rvert =$
22) $\lvert -3 \rvert =$	23) $\lvert 12 \rvert =$	24) $\lvert -6 \rvert =$

MODULE QUIZ

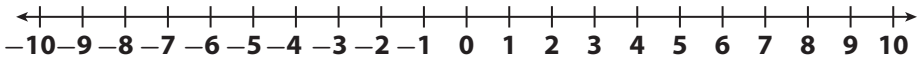
Ready to Go On?



1.1 Identifying Integers and Their Opposites

1. The table shows the elevations in feet of several locations around a coastal town. Graph and label the locations on the number line according to their elevations.

Location	Post Office *A*	Library *B*	Town Hall *C*	Laundromat *D*	Pet Store *E*
Elevation (feet)	8	−3	−9	3	1



Write the opposite of each number.

2. −22 _____ **3.** 0 _____

1.2 Comparing and Ordering Integers

List the numbers in order from least to greatest.

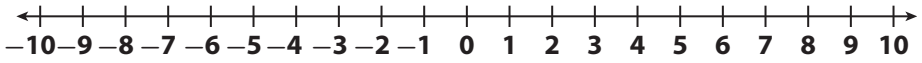
4. −2, 8, −15, −5, 3, 1 _____

Compare. Write < or >.

5. −3 ◯ −15 **6.** 9 ◯ −10

1.3 Absolute Value

Graph each number on the number line. Then use your number line to find the absolute value of each number.



7. 2 _____ **8.** −8 _____ **9.** −5 _____

ESSENTIAL QUESTION

10. How can you use absolute value to represent a negative number in a real-world situation?

_____

_____

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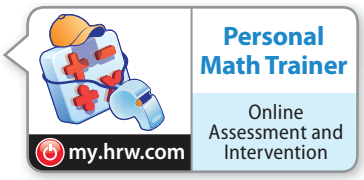
COMMON CORE

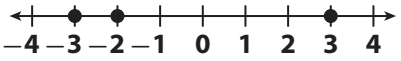
MODULE 1 MIXED REVIEW

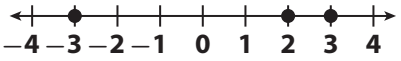
Assessment Readiness

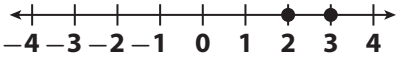


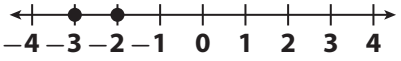
Selected Response

1. Which number line shows 2, 3, and −3?

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

2. What is the opposite of −3?

Ⓐ 3 Ⓒ $-\frac{1}{3}$

Ⓑ 0 Ⓓ $\frac{1}{3}$

3. Darrel is currently 20 feet below sea level. Which correctly describes the opposite of Darrel's elevation?

Ⓐ 20 feet below sea level

Ⓑ 20 feet above sea level

Ⓒ 2 feet below sea level

Ⓓ At sea level

4. Which has the same absolute value as −55?

Ⓐ 0 Ⓒ 1

Ⓑ −1 Ⓓ 55

5. In Bangor it is −3 °F, in Fairbanks it is −12 °F, in Fargo it is −8 °F, and in Calgary it is −15 °F. In which city is it the coldest?

Ⓐ Bangor Ⓒ Fargo

Ⓑ Fairbanks Ⓓ Calgary

6. Which shows the integers in order from least to greatest?

Ⓐ 20, 6, −2, −13 Ⓒ −13, −2, 6, 20

Ⓑ −2, 6, −13, 20 Ⓓ 20, −13, 6, −2

7. How would you use a number line to put integers in order from greatest to least?

Ⓐ Graph the integers, then read them from left to right.

Ⓑ Graph the integers, then read them from right to left.

Ⓒ Graph the absolute values of the integers, then read them from left to right.

Ⓓ Graph the absolute values of the integers, then read them from right to left.

Mini-Task

8. The table shows the change in the amounts of money in several savings accounts over the past month.

Account	Change
A	$125
B	−$45
C	−$302
D	$108

a. List the dollar amounts in the order in which they would appear on a number line from left to right.

_____

b. In which savings account was the absolute value of the change the greatest? Describe the change in that account.

_____

c. In which account was the absolute value of the change the least?

_____

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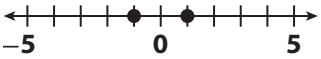
UNIT 1 Selected Answers

MODULE 1

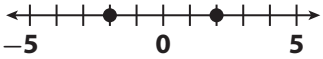
LESSON 1.1

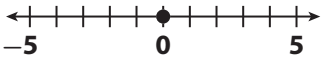
Your Turn

6. 

8. −10 **9.** 5 **10.** 0 **11.** 6

Guided Practice

2. 

4. 

5. −4 **6.** 11 **7.** −3 **8.** 3 **9.** 0 **10.** −22

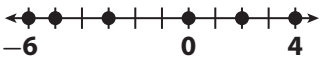
Independent Practice

13. 17 **15.** 2 **17.** 12 **19a.** gain **b.** Tino **c.** Tino and Luis **d.** −6 **e.** No; −6 pound change means Frankie lost 6 pounds. **21.** 4 units **23.** 14 units **25.** −9; it is 9 units away from 0 on a number line, and 6 is only 6 units away from 0.

LESSON 1.2

Your Turn

2. 4, 2, 0, −3, −5, −6



3. 9, 8, 5, 2, 0, −1, −6, −10
4. < **5.** < **6.** >
7. −2 > −18; −18 < −2
8. −39 < 39; 39 > −39

Guided Practice

1b. A **c.** B **2.** −9, −6, −3, 0, 1, 4, 8
3. −65, −13, −7, 7, 34, 55, 62
4. −17 > −22; −22 < −17 **5.** <
6. < **7.** > **8.** > **9.** > **10.** < **11.** <
12. > **13a.** −3 < 2 **b.** 0 > −4

Independent Practice

15b. E. Simpson **17.** 167 > −65
19b. −5, −2, 2, 4, 7 **21.** 377 > 249
23. Argentina **25.** No; −12 °F < −3 °F, so it was getting colder outside. **27.** −10, −3, 5, 16 and −3, 5, −10, 16

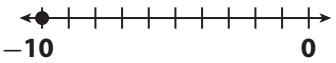
LESSON 1.3

Your Turn

4. The temperature at night reached 13 °F below zero.
5. 12 **6.** 91 **7.** 55 **8.** 0 **9.** 88 **10.** 1

Guided Practice

1. negative **2a.** −$10; it is a fee, so it represents a change of −$10 in the amount of money Ryan has.
b. | −10 | = 10



3a. more than 100 **b.** less than Leo **c.** more than 50

Independent Practice

5. The first week his balance changed by +$80. The second week his balance changed by −$85. **7b.** April **9a.** −5, 4, −1, 3, −2 **b.** The spinner landing on red results in a change of −$5 to Lisa's amount of money. **13.** No; −| −4 | = −4, and | −(−4) | = | 4 | = 4.

MODULE 2

LESSON 2.1

Your Turn

3. 7 **4.** 4 **5.** 8 teams; 4 girls, 5 boys

Guided Practice

1. Common factors: 1, 2, 4, 8; Possible numbers of vests: 1, 2, 4, 8; GCF = 8; greatest number of vests = 8 **2.** 9; 9; 4; 9; 5; 9; 4; 5
3. 15; 15; 5; 15; 6; 15; 5; 6

Independent Practice

5. 1, 2, 3, 4, 6, 12 **7.** 1, 3, 13, 39
9. 8 **11.** 5 **13.** 1 **15.** 12 **17.** 4
19. 1, 2, 4, or 8 shelves
21. 6 groups; 2 coaches and 7 players **23.** 8 × (7 + 8) = 8 × 15
25. 6 × (5 + 9) = 6 × 14
27. 11 × (5 + 6) 11 × 11
29. 5 × (8 + 5) 8 × 13
31. 1 is a factor of all whole numbers. Some pairs of whole numbers have no common factors other than 1. For example, 7 and 16 have no common factors other than 1. **33.** Find the factors of all three numbers, and take the greatest factor that is common to all three. For example, for the GCF of 6, 9, and 12, the factors of 6 are 1, 2, 3, and 6; the factors of 9 are 1, 3, and 9; and the factors of 12 are 1, 2, 3, 4, 6, and 12. So, the GCF is 3.

LESSON 2.2

Your Turn

2. 36; 4, 8, 12, 16, 20, 24, 28, 32, 36, 40; 9, 18, 27, 36, 45, 54, 63, 72, 81, 90

Guided Practice

1. 36th and 72nd visits; 36th visit

Independent Practice

3. 56 **5.** 60 **7.** 48 **9.** 45
11a. February 15 **b.** No; there are only 28 or 29 days in February, and the next common multiple of 3 and 5 is 30. **13.** 40 **15.** 120
17. The LCM is the greater of the two numbers. **19.** 5 and 12.

MODULE 3

LESSON 3.1

Your Turn

3. $\frac{-15}{1}$ **4.** $\frac{31}{100}$ **5.** $\frac{41}{9}$ **6.** $\frac{62}{1}$
9. rational numbers **10.** rational numbers **11.** integers and rational numbers **12.** whole numbers, integers, and rational numbers

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Name : _____ Score : _____

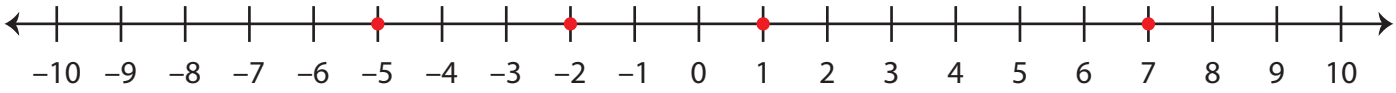
Answer key

Number Line - Integers

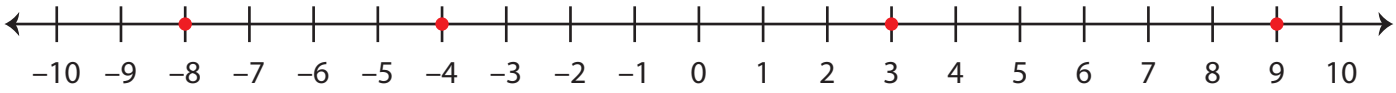
ES1

A) Mark the integers on the number line.

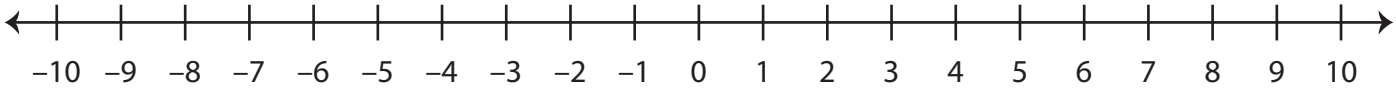
1) a) –2 b) 7 c) –5 d) 1



2) a) 9 b) –4 c) 3 d) –8



B) Answer the questions using the number line below.



1) 2 units to the left of 3 is **1**

2) 6 units to the right of –1 is **5**

3) 4 units to the left of –4 is **–8**

4) 3 units to the right of 7 is **10**

5) 1 unit to the left of 10 is **9**

6) 5 units to the right of –6 is **–1**

7) 8 units to the left of 5 is **–3**

Name : _____ Score : _____

Answer key

Comparing Integers

L1S1

Compare each pair of integers using the symbols >, < or =.

1) 13 [>] 9

2) −2 [=] −2

3) −1 [<] 10

4) 17 [>] −11

5) −14 [=] −14

6) −8 [<] 8

7) −7 [<] 15

8) 0 [>] −5

9) 19 [>] −6

10) 16 [<] 20

11) 12 [=] 12

12) −3 [>] −4

13) 6 [>] −17

14) 18 [=] 18

15) −16 [<] −13

16) −19 [<] 11

Name : _____ Score : _____

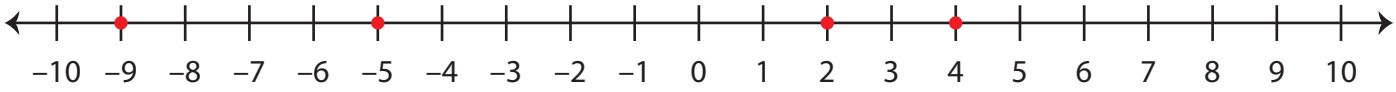
Answer key

Ordering Integers

Sheet 1

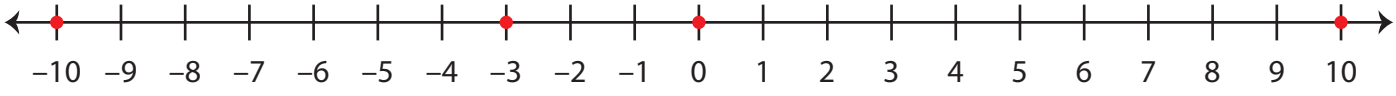
A) Mark the integers on the number line and order them from the least to the greatest.

1) –9, 4, –5, 2



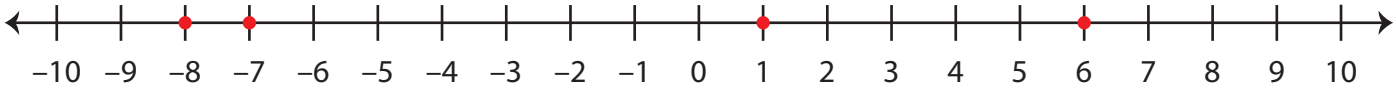
–9, –5, 2, 4

2) 10, 0, –3, –10



–10, –3, 0, 10

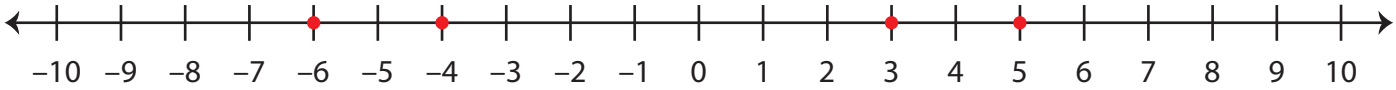
3) –7, 6, –8, 1



–8, –7, 1, 6

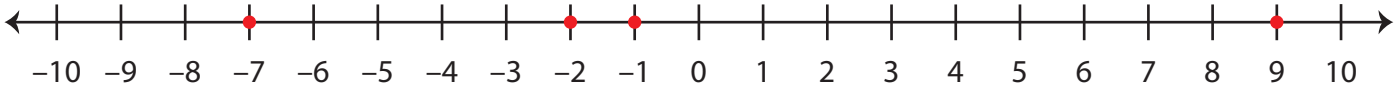
B) Mark the integers on the number line and order them from the greatest to the least.

1) 3, –6, –4, 5



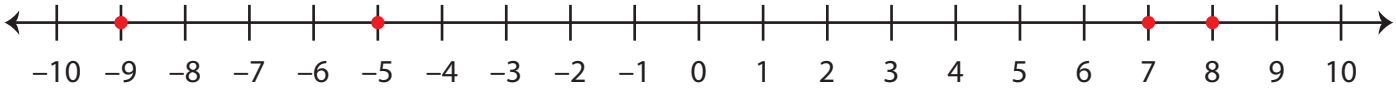
5, 3, –4, –6

2) –2, –1, 9, –7



9, –1, –2, –7

3) –5, 7, 8, –9



8, 7, –5, –9

Name: _____ Score:

Answer key

Absolute Value

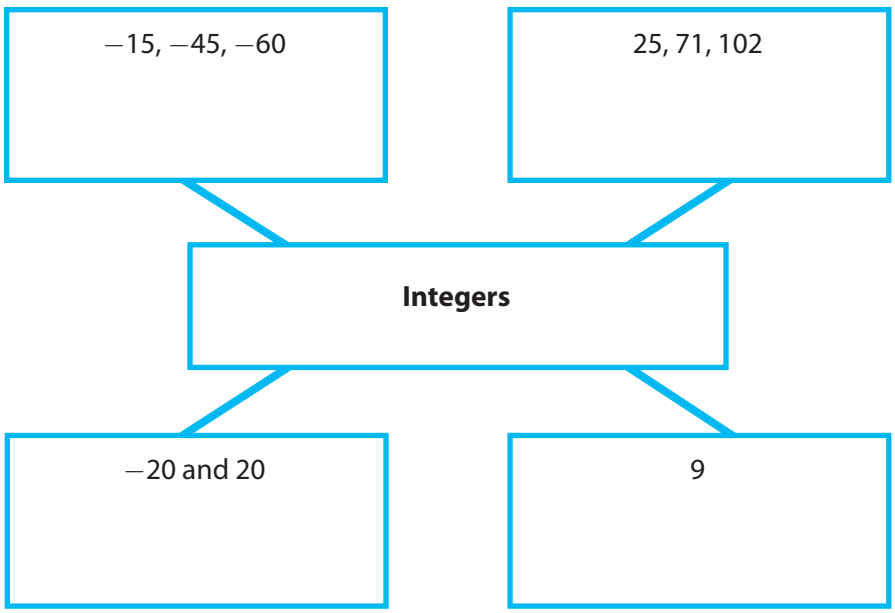
BS1

1) $\lvert 5 \rvert = 5$	2) $\lvert -13 \rvert = 13$	3) $\lvert 2 \rvert = 2$
4) $\lvert -11 \rvert = 11$	5) $\lvert 7 \rvert = 7$	6) $\lvert -4 \rvert = 4$
7) $\lvert 3 \rvert = 3$	8) $\lvert -14 \rvert = 14$	9) $\lvert 10 \rvert = 10$
10) $\lvert -13 \rvert = 13$	11) $\lvert 1 \rvert = 1$	12) $\lvert -7 \rvert = 7$
13) $\lvert 9 \rvert = 9$	14) $\lvert -5 \rvert = 5$	15) $\lvert 11 \rvert = 11$
16) $\lvert -7 \rvert = 7$	17) $\lvert 8 \rvert = 8$	18) $\lvert -15 \rvert = 15$
19) $\lvert 2 \rvert = 2$	20) $\lvert -9 \rvert = 9$	21) $\lvert 4 \rvert = 4$
22) $\lvert -3 \rvert = 3$	23) $\lvert 12 \rvert = 12$	24) $\lvert -6 \rvert = 6$

Reading Start-Up

Visualize Vocabulary

Use the ✔ words to complete the web. You may put more than one word in each box.



Understand Vocabulary

Fill in each blank with the correct term from the preview words.

1. A _____ is any number that can be written as a ratio of two integers.

2. A _____ is used to show the relationships between groups.

Vocabulary

Review Words

- absolute value *(valor absoluto)*
- decimal *(decimal)*
- dividend *(dividendo)*
- divisor *(divisor)*
- fraction *(fracción)*
- integers *(enteros)*
- ✔ negative numbers *(números negativos)*
- ✔ opposites *(opuestos)*
- ✔ positive numbers *(números positivos)*
- ✔ whole number *(número entero)*

Preview Words

- rational number *(número racional)*
- Venn diagram *(diagrama de Venn)*

Active Reading

Tri-Fold Before beginning the module, create a tri-fold to help you learn the concepts and vocabulary in this module. Fold the paper into three sections. Label the columns "What I Know," "What I Need to Know," and "What I Learned." Complete the first two columns before you read. After studying the module, complete the third column.

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MODULE 3

Unpacking the Standards

Understanding the standards and the vocabulary terms in the standards will help you know exactly what you are expected to learn in this module.

COMMON CORE 6.NS.7b

Write, interpret, and explain statements of order for rational numbers in real-world contexts.

Key Vocabulary

rational number *(número racional)*
Any number that can be expressed as a ratio of two integers.

What It Means to You

You can order rational numbers to understand relationships between values in the real world.

UNPACKING EXAMPLE 6.NS.7B

The fraction of crude oil produced in the United States by four states in 2011 is shown.

CA	$\frac{1}{100}$	TX	$\frac{9}{50}$
ND	$\frac{3}{50}$	AL	$\frac{3}{25}$

Which state produced the least oil?

$CA = \frac{1}{100}$ $\quad TX = \frac{9}{50} = \frac{18}{100}$

$ND = \frac{3}{50} = \frac{6}{100}$ $\quad AL = \frac{3}{25} = \frac{12}{100}$

California (CA) produced the least crude oil in 2011.

COMMON CORE 6.NS.7c

Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

Key Vocabulary

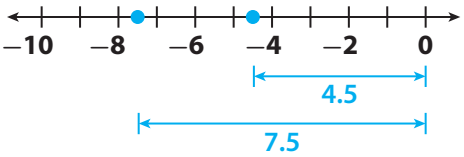
absolute value *(valor absoluto)*
A number's distance from 0 on the number line.

What It Means to You

You can use absolute value to describe a number's distance from 0 on a number line and compare quantities in real-world situations.

UNPACKING EXAMPLE 6.NS.7C

Use the number line to determine the absolute values of −4.5°F and −7.5°F and to compare the temperatures.



$|-4.5| = 4.5$ The absolute value of −4.5 is 4.5.

$|-7.5| = 7.5$ The absolute value of −7.5 is 7.5.

−7.5 is farther to the left of 0 than −4.5, so $-7.5 < -4.5$ and −7.5°F is colder than −4.5°F.

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LESSON 3.1

Classifying Rational Numbers

COMMON CORE 6.NS.6

Understand a rational number as a point on the number line…

ESSENTIAL QUESTION

How can you classify rational numbers?

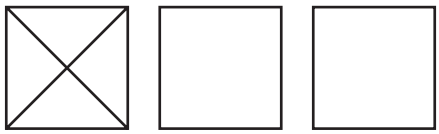
EXPLORE ACTIVITY Real World

COMMON CORE Prep for 6.NS.6

Representing Division as a Fraction

Alicia and her friends Brittany, Kenji, and Ellis are taking a pottery class. The four friends have to share 3 blocks of clay. How much clay will each of them receive if they divide the 3 blocks evenly?

A The top faces of the 3 blocks of clay can be represented by squares. Use the model to show the part of each block that each friend will receive. Explain.



_____

_____

B Each piece of one square is equal to what fraction of a block of clay?

_____

C Explain how to arrange the pieces to model the amount of clay each person gets. Sketch the model.

_____

D What fraction of a square does each person's pieces cover? Explain.

_____

_____

E How much clay will each person receive?

_____

F **Multiple Representations** How does this situation represent division?

_____

_____

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EXPLORE ACTIVITY *(cont'd)*

Reflect

1. **Communicate Mathematical Ideas** $3 \div 4$ can be written $\frac{3}{4}$. How are the dividend and divisor of a division expression related to the parts of a fraction?

_____

_____

2. **Analyze Relationships** How could you represent the division as a fraction if 5 people shared 2 blocks? if 6 people shared 5 blocks?

_____

Rational Numbers

A **rational number** is any number that can be written as $\frac{a}{b}$, where a and b are integers and $b \neq 0$.

EXAMPLE 1

COMMON CORE 6.NS.6

Write each rational number as $\frac{a}{b}$.

Math Talk
Mathematical Practices
What division is represented by the fraction $\frac{34}{1}$?

A $3\frac{2}{5}$ — *Convert the mixed number to a fraction greater than 1.* $3\frac{2}{5} = \frac{17}{5}$

B 0.6 — *The decimal is six tenths. Write as a fraction.* $0.6 = \frac{6}{10}$

C 34 — *Write the whole number as a fraction with a denominator of 1.* $34 = \frac{34}{1}$

D -7 — *Write the integer as a fraction with a denominator of 1.* $-7 = \frac{-7}{1}$

YOUR TURN

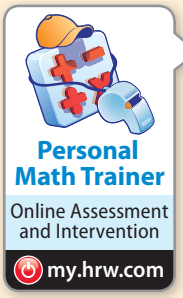
Write each rational number as $\frac{a}{b}$.

3. -15 _____

4. 0.31 _____

5. $4\frac{5}{9}$ _____

6. 62 _____



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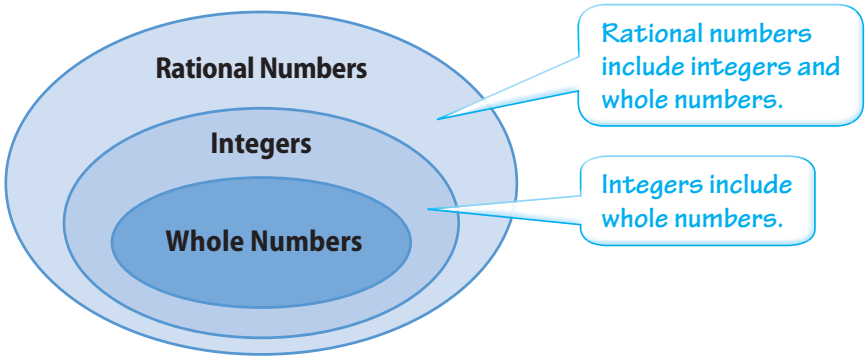
Classifying Rational Numbers

A **Venn diagram** is a visual representation used to show the relationships between groups. The Venn diagram below shows how rational numbers, integers, and whole numbers are related.



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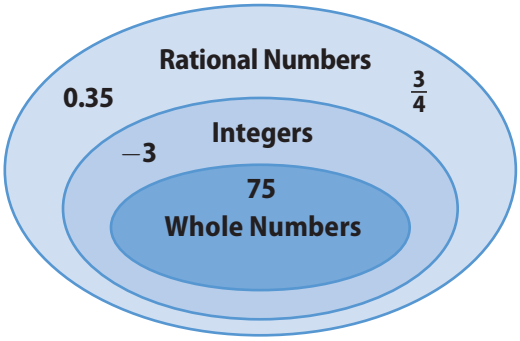
EXAMPLE 2

COMMON CORE 6.NS.6

Place each number in the Venn diagram. Then classify each number by indicating in which set or sets each number belongs.



A 75 — The number 75 belongs in the sets of whole numbers, integers, and rational numbers.

B −3 — The number −3 belongs in the sets of integers and rational numbers.

C $\frac{3}{4}$ — The number $\frac{3}{4}$ belongs in the set of rational numbers.

D 0.35 — The number 0.35 belongs in the set of rational numbers.

Reflect

7. **Analyze Relationships** Name two integers that are not also whole numbers.

_____

8. **Analyze Relationships** Describe how the Venn diagram models the relationship between rational numbers, integers, and whole numbers.

_____

_____

My Notes

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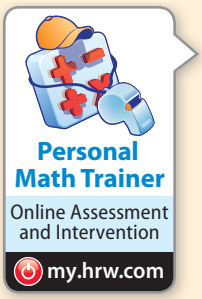
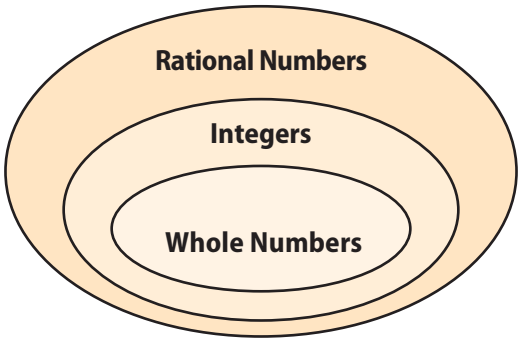


YOUR TURN

Place each number in the Venn diagram. Then classify each number by indicating in which set or sets it belongs.



9. 14.1 _____

10. $7\frac{1}{5}$ _____

11. −8 _____

12. 101 _____

Guided Practice

1. Sarah and four friends are decorating picture frames with ribbon. They have 4 rolls of ribbon to share evenly. (Explore Activity 1)

a. How does this situation represent division?

_____

b. How much ribbon does each person receive? _____

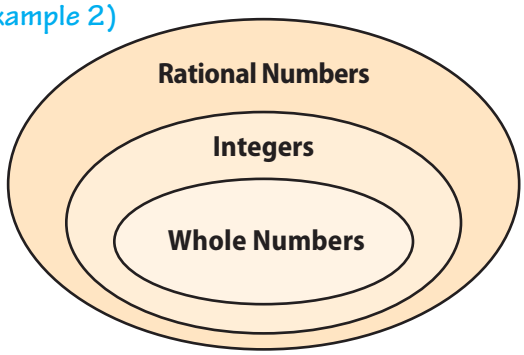
Write each rational number in the form $\frac{a}{b}$, where a and b are integers. (Example 1)

2. 0.7 _____ **3.** −29 _____ **4.** $8\frac{1}{3}$ _____

Place each number in the Venn diagram. Then classify each number by indicating in which set or sets each number belongs. (Example 2)

5. −15 _____

6. $5\frac{10}{11}$ _____



ESSENTIAL QUESTION CHECK-IN

7. How is a rational number that is not an integer different from a rational number that is an integer?

_____

_____

_____

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LESSON 3.2

Identifying Opposites and Absolute Value of Rational Numbers

COMMON CORE 6.NS.6c

Find and position integers and other rational numbers on a horizontal or vertical number line diagram . . . *Also 6.NS.6, 6.NS.6a, 6.NS.7, 6.NS.7c*

ESSENTIAL QUESTION

How do you identify opposites and absolute value of rational numbers?

EXPLORE ACTIVITY Real World

COMMON CORE 6.NS.6, 6.NS.6c

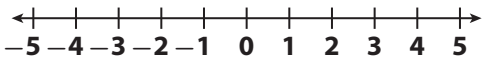
Positive and Negative Rational Numbers

Recall that positive numbers are greater than 0. They are located to the right of 0 on a number line. Negative numbers are less than 0. They are located to the left of 0 on a number line.

Water levels with respect to sea level, which has elevation 0, may be measured at beach tidal basins. Water levels below sea level are represented by negative numbers.

A The table shows the water level at a tidal basin at different times during a day. Graph the level for each time on the number line.

Time	4 A.M. *A*	8 A.M. *B*	Noon *C*	4 P.M. *D*	8 P.M. *E*
Level (ft)	3.5	2.5	−0.5	−2.5	0.5



B How did you know where to graph −0.5? _____

C At what time or times is the level closest to sea level? How do you know?

_____

D Which point is located halfway between −3 and −2? _____

E Which point is the same distance from 0 as *D*? _____

Reflect

1. **Communicate Mathematical Ideas** How would you graph −2.25? Would it be left or right of point *D*?

_____

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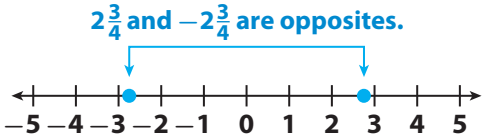
Rational Numbers and Opposites on a Number Line

You can find the opposites of rational numbers the same way you found the opposites of integers. Two rational numbers are opposites if they are the same distance from 0 but on different sides of 0.



EXAMPLE 1

Real World

COMMON CORE 6.NS.6a, 6.NS.6c

Until June 24, 1997, the New York Stock Exchange priced the value of a share of stock in eighths, such as $\$27\frac{1}{8}$ or at $\$41\frac{3}{4}$. The change in value of a share of stock from day to day was also represented in eighths as a positive or negative number.

The table shows the change in value of a stock over two days. Graph the change in stock value for Wednesday and its opposite on a number line.

Day	Tuesday	Wednesday
Change in value ($)	$1\frac{5}{8}$	$-4\frac{1}{4}$

STEP 1 Graph the change in stock value for Wednesday on the number line.

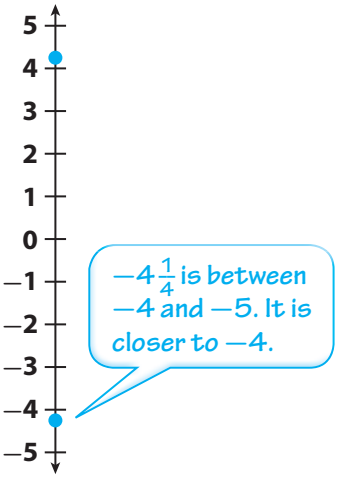
The change in value for Wednesday is $-4\frac{1}{4}$.

Graph a point $4\frac{1}{4}$ units below 0.

STEP 2 Graph the opposite of $-4\frac{1}{4}$.

The opposite of $-4\frac{1}{4}$ is the same distance from 0 but on the other side of 0.

The opposite of $-4\frac{1}{4}$ is $4\frac{1}{4}$.



The opposite of the change in stock value for Wednesday is $4\frac{1}{4}$.

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YOUR TURN

2. What are the opposites of 7, −3.5, 2.25, and $9\frac{1}{3}$?

_____

Absolute Values of Rational Numbers

You can also find the absolute value of a rational number the same way you found the absolute value of an integer. The absolute value of a rational number is the number's distance from 0 on the number line.

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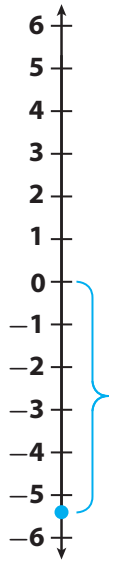
EXAMPLE 2

Real World

COMMON CORE 6.NS.7, 6.NS.7c

The table shows the average low temperatures in January in one location during a five-year span. Find the absolute value of the average January low temperature in 2009.

Year	2008	2009	2010	2011	2012
Temperature (°C)	−3.2	−5.4	−0.8	3.8	−2



STEP 1 Graph the 2009 average January low temperature.

The 2009 average January low is −5.4 °C. Graph a point 5.4 units below 0.

STEP 2 Find the absolute value of −5.4.

−5.4 is 5.4 units from 0.

$|-5.4| = 5.4$

Reflect

3. **Communicate Mathematical Ideas** What is the absolute value of the average January low temperature in 2011? How do you know?

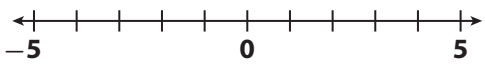
_____

_____

Math Talk
Mathematical Practices
How do you know where to graph −5.4?

YOUR TURN

Graph each number on the number line. Then use your number line to find each absolute value.



4. $-4.5; |-4.5| =$ _____

5. $1\frac{1}{2}; \left|1\frac{1}{2}\right| =$ _____

6. $4; |4| =$ _____

7. $-3\frac{1}{4}; \left|-3\frac{1}{4}\right| =$ _____

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My Notes

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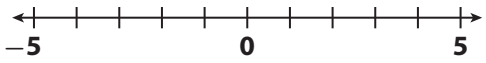
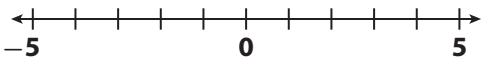
Guided Practice

Graph each number and its opposite on a number line. (Explore Activity and Example 1)

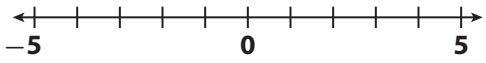
1. -2.8



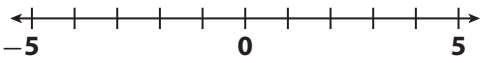
2. 4.3



3. $-3\frac{4}{5}$



4. $1\frac{1}{3}$



Find the opposite of each number. (Example 1)

5. 3.78 _____

6. $-7\frac{5}{12}$ _____

7. 0 _____

8. 4.2 _____

9. 12.1 _____

10. 2.6 _____

11. **Vocabulary** Explain why 2.15 and -2.15 are opposites. (Example 1)

_____

_____

Find the absolute value of each number. (Example 2)

12. 5.23 _____

13. $-4\frac{2}{11}$ _____

14. 0 _____

15. $-6\frac{3}{5}$ _____

16. -2.12 _____

17. 8.2 _____

ESSENTIAL QUESTION CHECK-IN

18. How do you identify the opposite and the absolute value of a rational number?

_____

_____

_____

_____

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LESSON 3.3

Comparing and Ordering Rational Numbers

COMMON CORE **6.NS.7a**

Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *Also 6.NS.7, 6.NS.7b*

ESSENTIAL QUESTION

How do you compare and order rational numbers?

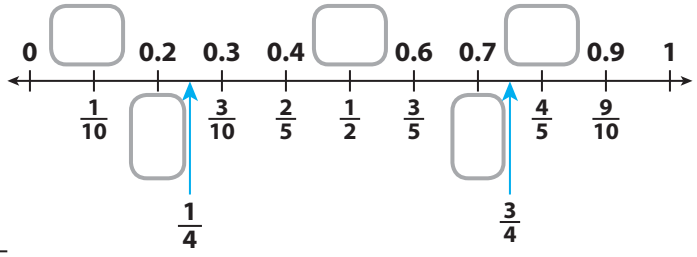
EXPLORE ACTIVITY COMMON CORE **Prep for 6.NS.7a**

Equivalent Fractions and Decimals

Fractions and decimals that represent the same value are *equivalent*. The number line shows equivalent fractions and decimals from 0 to 1.

A Complete the number line by writing the missing decimals or fractions.

B Use the number line to find a fraction that is equivalent to 0.25. Explain.



_____

_____

C Explain how to use a number line to find a decimal equivalent to $1\frac{7}{10}$.

_____

_____

D Use the number line to complete each statement.

0.2 = _____ _____ = $\frac{3}{10}$ 0.75 = _____ 1.25 = _____

Reflect

1. **Communicate Mathematical Ideas** How does a number line represent equivalent fractions and decimals?

_____

_____

2. Name a decimal between 0.4 and 0.5.

_____

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Ordering Fractions and Decimals

You can order fractions and decimals by rewriting the fractions as equivalent decimals or by rewriting the decimals as equivalent fractions.

EXAMPLE 1

COMMON CORE 6.NS.7, 6.NS.7a

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A Order 0.2, $\frac{3}{4}$, 0.8, $\frac{1}{2}$, $\frac{1}{4}$, and 0.4 from least to greatest.

STEP 1 Write the fractions as equivalent decimals.

$\frac{1}{4} = 0.25$ $\frac{1}{2} = 0.5$ $\frac{3}{4} = 0.75$

STEP 2 Use the number line to write the decimals in order.

$0.2 < 0.25 < 0.4 < 0.5 < 0.75 < 0.8$

The numbers from least to greatest are 0.2, $\frac{1}{4}$, 0.4, $\frac{1}{2}$, $\frac{3}{4}$, 0.8.

B Order $\frac{1}{12}$, $\frac{2}{3}$, and 0.35 from least to greatest.

STEP 1 Write the decimal as an equivalent fraction.

$$0.35 = \frac{35}{100} = \frac{7}{20}$$

60 is a multiple of the denominators of all three fractions.

STEP 2 Find equivalent fractions with *60* as the common denominator.

$\frac{1}{12} \overset{\times 5}{=} \frac{5}{60}$ $\frac{2}{3} \overset{\times 20}{=} \frac{40}{60}$ $\frac{7}{20} \overset{\times 3}{=} \frac{21}{60}$

STEP 3 Order fractions with common denominators by comparing the numerators.

$$5 < 21 < 40$$

The fractions in order from least to greatest are $\frac{5}{60}$, $\frac{21}{60}$, $\frac{40}{60}$.

The numbers in order from least to greatest are $\frac{1}{12}$, 0.35, and $\frac{2}{3}$.

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YOUR TURN

Order the fractions and decimals from least to greatest.

3. 0.85, $\frac{3}{5}$, 0.15, $\frac{7}{10}$ _____

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Ordering Rational Numbers

You can use a number line to order positive and negative rational numbers.

EXAMPLE 2

Real World

COMMON CORE 6.NS.7a, 6.NS.7b

Five friends completed a triathlon that included a 3-mile run, a 12-mile bike ride, and a $\frac{1}{2}$-mile swim. To compare their running times they created a table that shows the difference between each person's time and the average time, with negative numbers representing times less than the average.

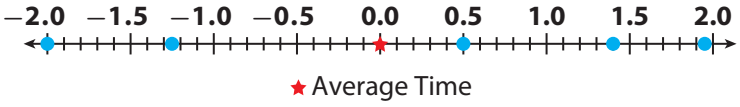
Runner	John	Sue	Anna	Mike	Tom
Time above or below average (minutes)	$\frac{1}{2}$	1.4	$-1\frac{1}{4}$	-2.0	1.95

Order the numbers from greatest to least.

STEP 1 Write the fractions as equivalent decimals.

$\frac{1}{2} = 0.5 \quad -1\frac{1}{4} = -1.25$

STEP 2 Use the number line to write the decimals in order.



$1.95 > 1.4 > 0.5 > -1.25 > -2.0$

The numbers in order from greatest to least are 1.95, 1.4, $\frac{1}{2}$, $-1\frac{1}{4}$, -2.0.

Math Talk

Mathematical Practices

Who was the fastest runner? Explain.

Reflect

4. **Communicate Mathematical Ideas** Describe a different way to order the numbers.

_____

_____

_____

YOUR TURN

5. To compare their bike times, the friends created a table that shows the difference between each person's time and the average bike time. Order the bike times from least to greatest.

Biker	John	Sue	Anna	Mike	Tom
Time above or below average (minutes)	-1.8	1	$1\frac{2}{5}$	$1\frac{9}{10}$	-1.25

_____

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Guided Practice

Find the equivalent fraction or decimal for each number.
(Explore Activity 1)

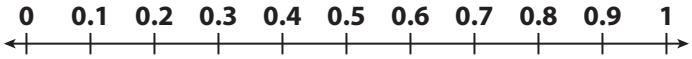
1. $0.6 =$ _____ **2.** $\frac{1}{4} =$ _____ **3.** $0.9 =$ _____

4. $0.1 =$ _____ **5.** $\frac{3}{10} =$ _____ **6.** $1.4 =$ _____

7. $\frac{4}{5} =$ _____ **8.** $0.4 =$ _____ **9.** $\frac{6}{8} =$ _____

Use the number line to order the fractions and decimals from least to greatest. (Example 1)

10. 0.75, $\frac{1}{2}$, 0.4, and $\frac{1}{5}$



_____

11. The table shows the lengths of fish caught by three friends at the lake last weekend. Write the lengths in order from greatest to least. (Example 1)

Lengths of Fish (cm)		
Emma	**Anne**	**Emily**
12.7	$12\frac{3}{5}$	$12\frac{3}{4}$

_____

List the fractions and decimals in order from least to greatest.
(Example 1, Example 2)

12. 2.3, $2\frac{4}{5}$, 2.6

_____

13. 0.5, $\frac{3}{16}$, 0.75, $\frac{5}{48}$

_____

14. 0.5, $\frac{1}{5}$, 0.35, $\frac{12}{25}$, $\frac{4}{5}$

_____

15. $\frac{3}{4}$, $-\frac{7}{10}$, $-\frac{3}{4}$, $\frac{8}{10}$

_____

16. $-\frac{3}{8}$, $\frac{5}{16}$, -0.65, $\frac{2}{4}$

_____

17. -2.3, $-2\frac{4}{5}$, -2.6

_____

18. -0.6, $-\frac{5}{8}$, $-\frac{7}{12}$ -0.72

_____

19. 1.45, $1\frac{1}{2}$, $1\frac{1}{3}$, 1.2

_____

20. -0.3, 0.5, 0.55, -0.35

_____

ESSENTIAL QUESTION CHECK-IN

21. Explain how to compare 0.7 and $\frac{5}{8}$.

_____

_____

_____

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Name : _____ Score : _____

Teacher : _____ Date : _____

Write the Correct Comparison Symbol (>, < or =) in Each Box

1)	$\frac{3}{4}$	☐	0.75	11)	$\frac{1}{2}$	☐	0.55
2)	$\frac{-1}{3}$	☐	-0.333	12)	$\frac{1}{2}$	☐	0.5
3)	$\frac{-1}{4}$	☐	-0.25	13)	$\frac{2}{4}$	☐	0.5
4)	$\frac{2}{3}$	☐	0.817	14)	$\frac{-2}{3}$	☐	-0.567
5)	$\frac{1}{3}$	☐	0.458	15)	$\frac{-3}{4}$	☐	-0.725
6)	$\frac{1}{4}$	☐	0.375	16)	$\frac{-1}{2}$	☐	-0.425
7)	$\frac{-1}{4}$	☐	-0.325	17)	$\frac{-1}{4}$	☐	-0.25
8)	$\frac{-1}{2}$	☐	-0.625	18)	$\frac{-1}{2}$	☐	-0.525
9)	$\frac{-2}{3}$	☐	-0.717	19)	$\frac{2}{4}$	☐	0.35
10)	$\frac{2}{3}$	☐	0.567	20)	$\frac{2}{3}$	☐	0.542

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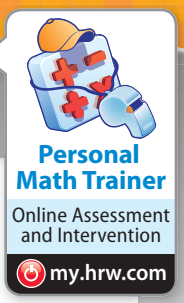
Fractions Worksheets

MODULE QUIZ

Ready to Go On?



3.1 Classifying Rational Numbers

1. Five friends divide three bags of apples equally between them. Write the division represented in this situation as a fraction. _____

Write each rational number in the form $\frac{a}{b}$, where a and b are integers.

2. $5\frac{1}{6}$ _____ **3.** -12 _____

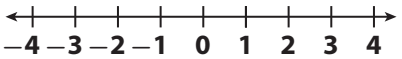
Determine if each number is a whole number, integer, or rational number. Include all sets to which each number belongs.

4. -12 _____

5. $\frac{7}{8}$ _____

3.2 Identifying Opposites and Absolute Value of Rational Numbers

6. Graph -3, $1\frac{3}{4}$, -0.5, and 3 on the number line.



7. Find the opposite of $\frac{1}{3}$ and of $-\frac{7}{12}$. _____

8. Find the absolute value of 9.8 and of $-\frac{10}{3}$. _____

3.3 Comparing and Ordering Rational Numbers

9. Over the last week, the daily low temperatures in degrees Fahrenheit have been -4, 6.2, $18\frac{1}{2}$, -5.9, 21, $-\frac{1}{4}$, and 1.75. List these numbers in order from greatest to least.

_____

ESSENTIAL QUESTION

10. How can you order rational numbers from least to greatest?

_____

_____

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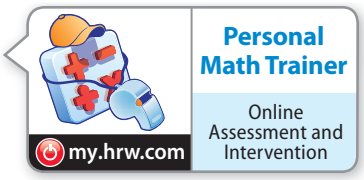
MODULE 3 MIXED REVIEW

Assessment Readiness



Selected Response

1. Suki split five dog treats equally among her six dogs. Which fraction represents this division?

Ⓐ $\frac{6}{5}$ of a treat Ⓒ $\frac{1}{5}$ of a treat

Ⓑ $\frac{5}{6}$ of a treat Ⓓ $\frac{1}{6}$ of a treat

2. Which set or sets does the number 15 belong to?

Ⓐ whole numbers only

Ⓑ rational numbers only

Ⓒ integers and rational numbers only

Ⓓ whole numbers, integers, and rational numbers

3. Which of the following statements about rational numbers is correct?

Ⓐ All rational numbers are also whole numbers.

Ⓑ All rational numbers are also integers.

Ⓒ All rational numbers can be written in the form $\frac{a}{b}$, where a and b are integers and $b \neq 0$.

Ⓓ Rational numbers cannot be negative.

4. Which of the following shows the numbers in order from least to greatest?

Ⓐ $-\frac{1}{5}, -\frac{2}{3}, 2, 0.4$

Ⓑ $2, -\frac{2}{3}, 0.4, -\frac{1}{5}$

Ⓒ $-\frac{2}{3}, 0.4, -\frac{1}{5}, 2$

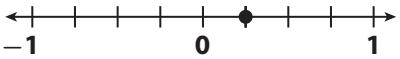
Ⓓ $-\frac{2}{3}, -\frac{1}{5}, 0.4, 2$

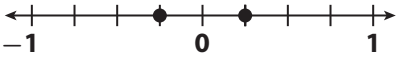
5. What is the absolute value of -12.5?

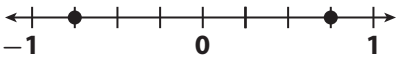
Ⓐ 12.5 Ⓒ -1

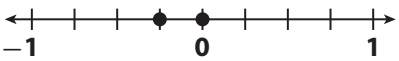
Ⓑ 1 Ⓓ -12.5

6. Which number line shows $-\frac{1}{4}$ and its opposite?

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

7. Horatio climbed to the top of a ladder that is 10 feet high. Which number is the opposite of the number that represents Horatio's height?

Ⓐ -10 Ⓒ 0

Ⓑ 10 Ⓓ $\frac{1}{10}$

Mini-Task

8. The table shows the heights in feet of several students in Mrs. Patel's class.

Name	Height (ft)
Olivia	$5\frac{1}{4}$
James	5.5
Carmela	4.9
Feng	5

a. Write each height in the form $\frac{a}{b}$.

_____

b. List the heights in order from greatest to least.

_____

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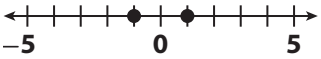
UNIT 1 Selected Answers

MODULE 1

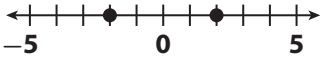
LESSON 1.1

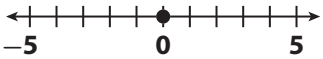
Your Turn

6. 

8. −10 **9.** 5 **10.** 0 **11.** 6

Guided Practice

2. 

4. 

5. −4 **6.** 11 **7.** −3 **8.** 3 **9.** 0 **10.** −22

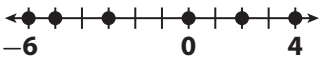
Independent Practice

13. 17 **15.** 2 **17.** 12 **19a.** gain **b.** Tino **c.** Tino and Luis **d.** −6 **e.** No; −6 pound change means Frankie lost 6 pounds. **21.** 4 units **23.** 14 units **25.** −9; it is 9 units away from 0 on a number line, and 6 is only 6 units away from 0.

LESSON 1.2

Your Turn

2. 4, 2, 0, −3, −5, −6



3. 9, 8, 5, 2, 0, −1, −6, −10
4. < **5.** < **6.** >
7. −2 > −18; −18 < −2
8. −39 < 39; 39 > −39

Guided Practice

1b. A **c.** B **2.** −9, −6, −3, 0, 1, 4, 8
3. −65, −13, −7, 7, 34, 55, 62
4. −17 > −22; −22 < −17 **5.** <
6. < **7.** > **8.** > **9.** > **10.** < **11.** <
12. > **13a.** −3 < 2 **b.** 0 > −4

Independent Practice

15b. E. Simpson **17.** 167 > −65
19b. −5, −2, 2, 4, 7 **21.** 377 > 249
23. Argentina **25.** No; −12 °F < −3 °F, so it was getting colder outside. **27.** −10, −3, 5, 16 and −3, 5, −10, 16

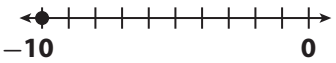
LESSON 1.3

Your Turn

4. The temperature at night reached 13 °F below zero.
5. 12 **6.** 91 **7.** 55 **8.** 0 **9.** 88 **10.** 1

Guided Practice

1. negative **2a.** −$10; it is a fee, so it represents a change of −$10 in the amount of money Ryan has.
b. | −10 | = 10



3a. more than 100 **b.** less than Leo **c.** more than 50

Independent Practice

5. The first week his balance changed by +$80. The second week his balance changed by −$85. **7b.** April **9a.** −5, 4, −1, 3, −2 **b.** The spinner landing on red results in a change of −$5 to Lisa's amount of money. **13.** No; −| −4 | = −4, and | −(−4) | = | 4 | = 4.

MODULE 2

LESSON 2.1

Your Turn

3. 7 **4.** 4 **5.** 8 teams; 4 girls, 5 boys

Guided Practice

1. Common factors: 1, 2, 4, 8; Possible numbers of vests: 1, 2, 4, 8; GCF = 8; greatest number of vests = 8 **2.** 9; 9; 4; 9; 5; 9; 4; 5
3. 15; 15; 5; 15; 6; 15; 5; 6

Independent Practice

5. 1, 2, 3, 4, 6, 12 **7.** 1, 3, 13, 39
9. 8 **11.** 5 **13.** 1 **15.** 12 **17.** 4
19. 1, 2, 4, or 8 shelves
21. 6 groups; 2 coaches and 7 players **23.** 8 × (7 + 8) = 8 × 15
25. 6 × (5 + 9) = 6 × 14
27. 11 × (5 + 6) 11 × 11
29. 5 × (8 + 5) 8 × 13
31. 1 is a factor of all whole numbers. Some pairs of whole numbers have no common factors other than 1. For example, 7 and 16 have no common factors other than 1. **33.** Find the factors of all three numbers, and take the greatest factor that is common to all three. For example, for the GCF of 6, 9, and 12, the factors of 6 are 1, 2, 3, and 6; the factors of 9 are 1, 3, and 9; and the factors of 12 are 1, 2, 3, 4, 6, and 12. So, the GCF is 3.

LESSON 2.2

Your Turn

2. 36; 4, 8, 12, 16, 20, 24, 28, 32, 36, 40; 9, 18, 27, 36, 45, 54, 63, 72, 81, 90

Guided Practice

1. 36th and 72nd visits; 36th visit

Independent Practice

3. 56 **5.** 60 **7.** 48 **9.** 45
11a. February 15 **b.** No; there are only 28 or 29 days in February, and the next common multiple of 3 and 5 is 30. **13.** 40 **15.** 120
17. The LCM is the greater of the two numbers. **19.** 5 and 12.

MODULE 3

LESSON 3.1

Your Turn

3. $\frac{-15}{1}$ **4.** $\frac{31}{100}$ **5.** $\frac{41}{9}$ **6.** $\frac{62}{1}$
9. rational numbers **10.** rational numbers **11.** integers and rational numbers **12.** whole numbers, integers, and rational numbers

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UNIT 1 Selected Answers *(cont'd)*

Guided Practice

1a. 4 rolls of ribbon divided evenly among the 5 friends. $4 \div 5$.
b. $\frac{4}{5}$ roll **2.** $\frac{7}{10}$ **3.** $\frac{-29}{1}$ **4.** $\frac{25}{3}$
5. integers, rational numbers
6. rational numbers

Independent Practice

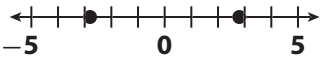
11. $\frac{22}{5}$, or \$4.40 **13.** Venn **15.** $\$\frac{35}{2}$, rational numbers **17.** $\frac{8}{15}$ cup

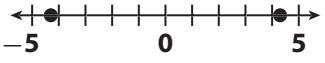
LESSON 3.2

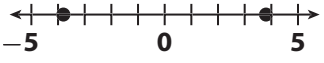
Your Turn

2. -7, 3.5, -2.25, and $-9\frac{1}{3}$. **4.** 4.5
5. $1\frac{1}{2}$ **6.** 4 **7.** $3\frac{1}{4}$

Guided Practice

1.


2.


3.


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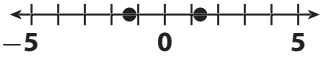
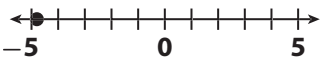


5. -3.78 **6.** $7\frac{5}{12}$ **7.** 0 **8.** -4.2
9. -12.1 **10.** -2.6 **11.** They are the same distance from 0 on the number line. **12.** 5.23 **13.** $4\frac{2}{11}$
14. 0 **15.** $6\frac{3}{5}$ **16.** 2.12 **17.** 8.2

Independent Practice

19a. Girardi \$85.23, Lewis $-$\$20.44, Stein \$116.33, Yuan $-$\$13.50, Wenner \$9.85
b. Wenner **c.** Stein **23.** to the left
25a. $-25{,}344$ ft **b.** -5 and -4
c.


LESSON 3.3

Your Turn

3. 0.15, $\frac{3}{5}$, $\frac{7}{10}$, 0.85 **5.** -1.8, -1.25, 1, $1\frac{2}{5}$, $1\frac{9}{10}$

Guided Practice

1. $\frac{3}{5}$ **2.** 0.25 **3.** $\frac{9}{10}$ **4.** $\frac{1}{10}$ **5.** 0.3
6. $1\frac{2}{5}$ **7.** 0.8 **8.** $\frac{2}{5}$ **9.** 0.75
10. $\frac{1}{5}$, 0.4, $\frac{1}{2}$, 0.75 **11.** $12\frac{3}{4}$, 12.7, $12\frac{3}{5}$
12. 2.3, 2.6, $2\frac{4}{5}$ **13.** $\frac{5}{48}$, $\frac{3}{16}$, 0.5, 0.75
14. $\frac{1}{5}$, 0.35, $\frac{12}{25}$, 0.5, $\frac{4}{5}$ **15.** $-\frac{3}{4}$, $-\frac{7}{10}$, $\frac{3}{4}$, $\frac{8}{10}$ **16.** -0.65, $-\frac{3}{8}$, $\frac{5}{16}$, $\frac{2}{4}$ **17.** $-2\frac{4}{5}$, -2.6, -2.3 **18.** -0.72, $-\frac{5}{8}$, -0.6, $-\frac{7}{12}$
19. 1.2, $1\frac{1}{3}$, 1.45, $1\frac{1}{2}$ **20.** -0.35, -0.3, 0.5, 0.55

Independent Practice

23a. $6\frac{1}{6}$, 5.5, $4\frac{3}{8}$, 4.3, $\frac{15}{4}$ **b.** Claire, Peter, Brenda, and Jim; Micah
c. Yes; the smallest donation is $\frac{15}{4}$ pounds. $\frac{1}{2}$ is equal to $\frac{2}{4}$ pound. $\frac{15}{4} + \frac{2}{4} = \frac{17}{4} = 4\frac{1}{4} = 4.25$ pounds, which is enough to win a free movie coupon.

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Name : _____ Score : _____

Teacher : _____ Date : _____

Write the Correct Comparison Symbol (>, < or =) in Each Box

1) $\frac{3}{4}$ [=] 0.75

2) $\frac{-1}{3}$ [=] -0.333

3) $\frac{-1}{4}$ [=] -0.25

4) $\frac{2}{3}$ [<] 0.817

5) $\frac{1}{3}$ [<] 0.458

6) $\frac{1}{4}$ [<] 0.375

7) $\frac{-1}{4}$ [>] -0.325

8) $\frac{-1}{2}$ [>] -0.625

9) $\frac{-2}{3}$ [>] -0.717

10) $\frac{2}{3}$ [>] 0.567

11) $\frac{1}{2}$ [<] 0.55

12) $\frac{1}{2}$ [=] 0.5

13) $\frac{2}{4}$ [=] 0.5

14) $\frac{-2}{3}$ [<] -0.567

15) $\frac{-3}{4}$ [<] -0.725

16) $\frac{-1}{2}$ [<] -0.425

17) $\frac{-1}{4}$ [=] -0.25

18) $\frac{-1}{2}$ [>] -0.525

19) $\frac{2}{4}$ [>] 0.35

20) $\frac{2}{3}$ [>] 0.542

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Fractions Worksheets

LESSON 12.1

Graphing on the Coordinate Plane

COMMON CORE 6.NS.6c

. . . find and position pairs of integers and other rational numbers on a coordinate plane. *Also 6.NS.6, 6.NS.6b, 6.NS.8*

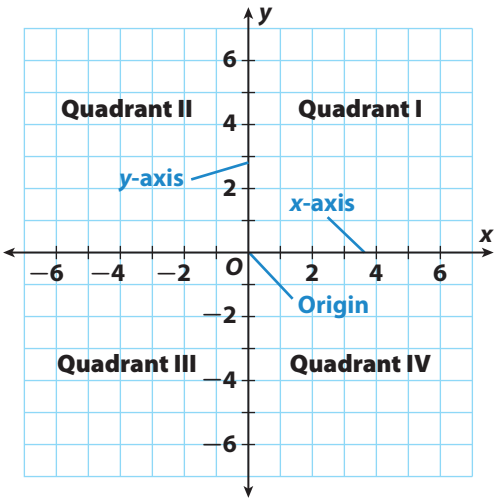
ESSENTIAL QUESTION

How do you locate and name points in the coordinate plane?

Naming Points in the Coordinate Plane

A **coordinate plane** is formed by two number lines that intersect at right angles. The point of intersection is 0 on each number line.

- The two number lines are called the **axes**.
- The horizontal axis is called the ***x*-axis**.
- The vertical axis is called the ***y*-axis**.
- The point where the axes intersect is called the **origin**.
- The two axes divide the coordinate plane into four **quadrants**.



An **ordered pair** is a pair of numbers that gives the location of a point on a coordinate plane. The first number tells how far to the right (positive) or left (negative) the point is located from the origin. The second number tells how far up (positive) or down (negative) the point is located from the origin.

The numbers in an ordered pair are called **coordinates**. The first number is the ***x*-coordinate** and the second number is the ***y*-coordinate**.

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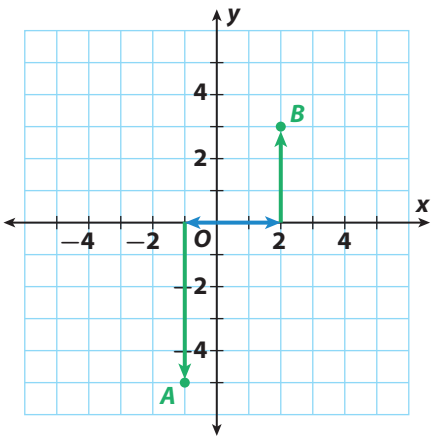
EXAMPLE 1

COMMON CORE 6.NS.6c, 6.NS.6b

Identify the coordinates of each point. Name the quadrant where each point is located.



Point *A* is 1 unit *left* of the origin, and 5 units *down*. It has *x*-coordinate −1 and *y*-coordinate −5, written (−1, −5). It is located in Quadrant III.

Point *B* is 2 units *right* of the origin, and 3 units *up*. It has *x*-coordinate 2 and *y*-coordinate 3, written (2, 3). It is located in Quadrant I.

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Reflect

1. If both coordinates of a point are negative, in which quadrant is the point located? _____

2. Describe the coordinates of all points in Quadrant I.

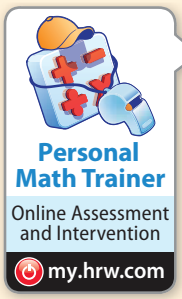
_____

3. **Communicate Mathematical Ideas** Explain why (−3, 5) represents a different location than (3, 5).

_____

_____

_____



YOUR TURN

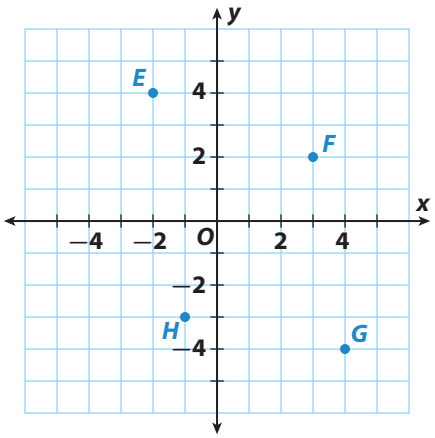
Identify the coordinates of each point. Name the quadrant where each point is located.

4. *G* _____

   E _____

5. *F* _____

   H _____



Graphing Points in the Coordinate Plane

Points that are located on the axes are not located in any quadrant. Points on the *x*-axis have a *y*-coordinate of 0, and points on the *y*-axis have an *x*-coordinate of 0.

EXAMPLE 2

COMMON CORE 6.NS.6c, 6.NS.6

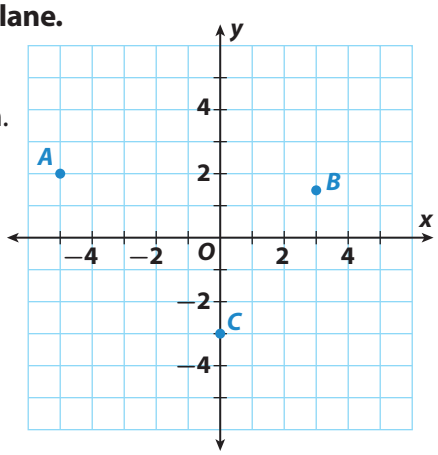
Graph and label each point on the coordinate plane.

***A*(−5, 2), *B*(3, 1.5), *C*(0, −3)**

Point *A* is 5 units *left* and 2 units *up* from the origin.

Point *B* is 3 units *right* and 1.5 units *up* from the origin. Graph the point halfway between (3, 1) and (3, 2).

Point *C* is 3 units *down* from the origin. Graph the point on the *y*-axis.



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YOUR TURN

Graph and label each point on the coordinate plane.

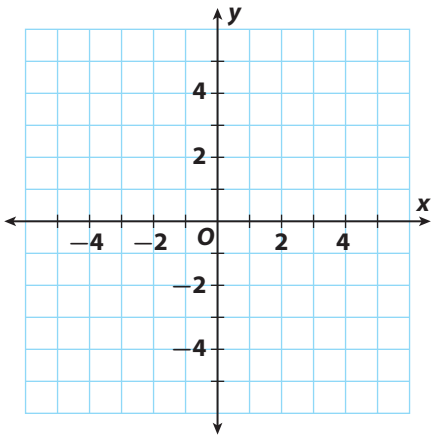
6. $P(-4, 2)$

7. $Q(3, 2.5)$

8. $R(-4.5, -5)$

9. $S(4, -5)$

10. $T(-2.5, 0)$



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Reading Scales on Axes

The *scale* of an axis is the number of units that each grid line represents. So far, the graphs in this lesson have a scale of 1 unit, but graphs frequently use other units.

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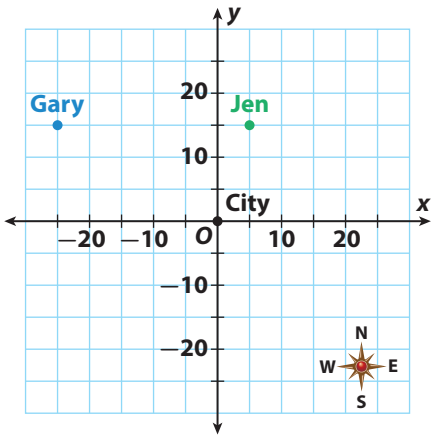
EXAMPLE 3

Real World

COMMON CORE 6.NS.8

The graph shows the location of a city. It also shows the location of Gary's and Jen's houses. The scale on each axis represents miles.



A Use the scale to describe Gary's location relative to the city.

Each grid square is 5 miles on a side.

Gary's house is at $(-25, 15)$, which is 25 miles west and 15 miles north of the city.

B Describe the location of Jen's house relative to Gary's house.

Jen's house is located 6 grid squares to the right of Gary's house. Since each grid square is 5 miles on a side, her house is $6 \cdot 5 = 30$ miles from Gary's.

Math Talk
Mathematical Practices

How are north, south, east, and west represented on the graph in Example 3?

YOUR TURN

Use the graph in the Example.

11. Ted lives 20 miles south and 20 miles west of the city represented on the graph in Example 3. His brother Ned lives 50 miles north of Ted's house. Give the coordinates of each brother's house.

_____

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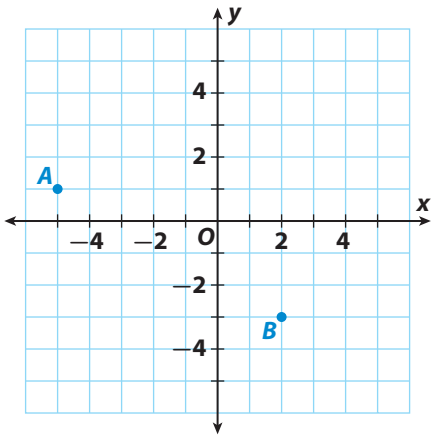
Guided Practice

Identify the coordinates of each point in the coordinate plane. Name the quadrant where each point is located. (Example 1)



1. Point *A* is 5 units _____ of the origin and 1 unit _____ from the origin.

Its coordinates are _____. It is in quadrant _____.

2. Point *B* is _____ units right of the origin and _____ units down from the origin.

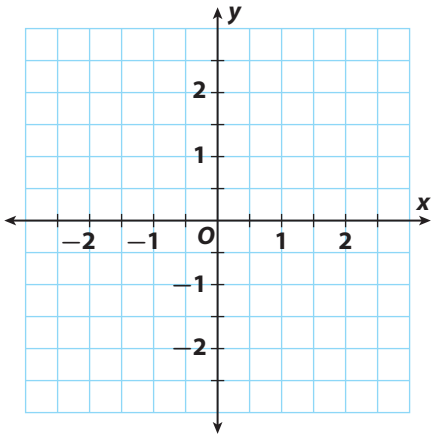
Its coordinates are _____. It is in quadrant _____.

Graph and label each point on the coordinate plane above. (Example 2)

3. Point *C* at (−3.5, 3)

4. Point *D* at (5, 0)

For 5–7, use the coordinate plane shown. (Example 3)



5. Describe the scale of the graph.

_____

6. Plot point *A* at $\left(-\frac{1}{2}, 2\right)$.

7. Plot point *B* at $\left(2\frac{1}{2}, -2\right)$.

8. **Vocabulary** Describe how an ordered pair represents a point on a coordinate plane. Include the terms *x*-coordinate, *y*-coordinate, and origin in your answer.

_____

_____

_____

_____

ESSENTIAL QUESTION CHECK-IN

9. Give the coordinates of one point in each of the four quadrants, one point on the *x*-axis, and one point on the *y*-axis.

_____

_____

_____

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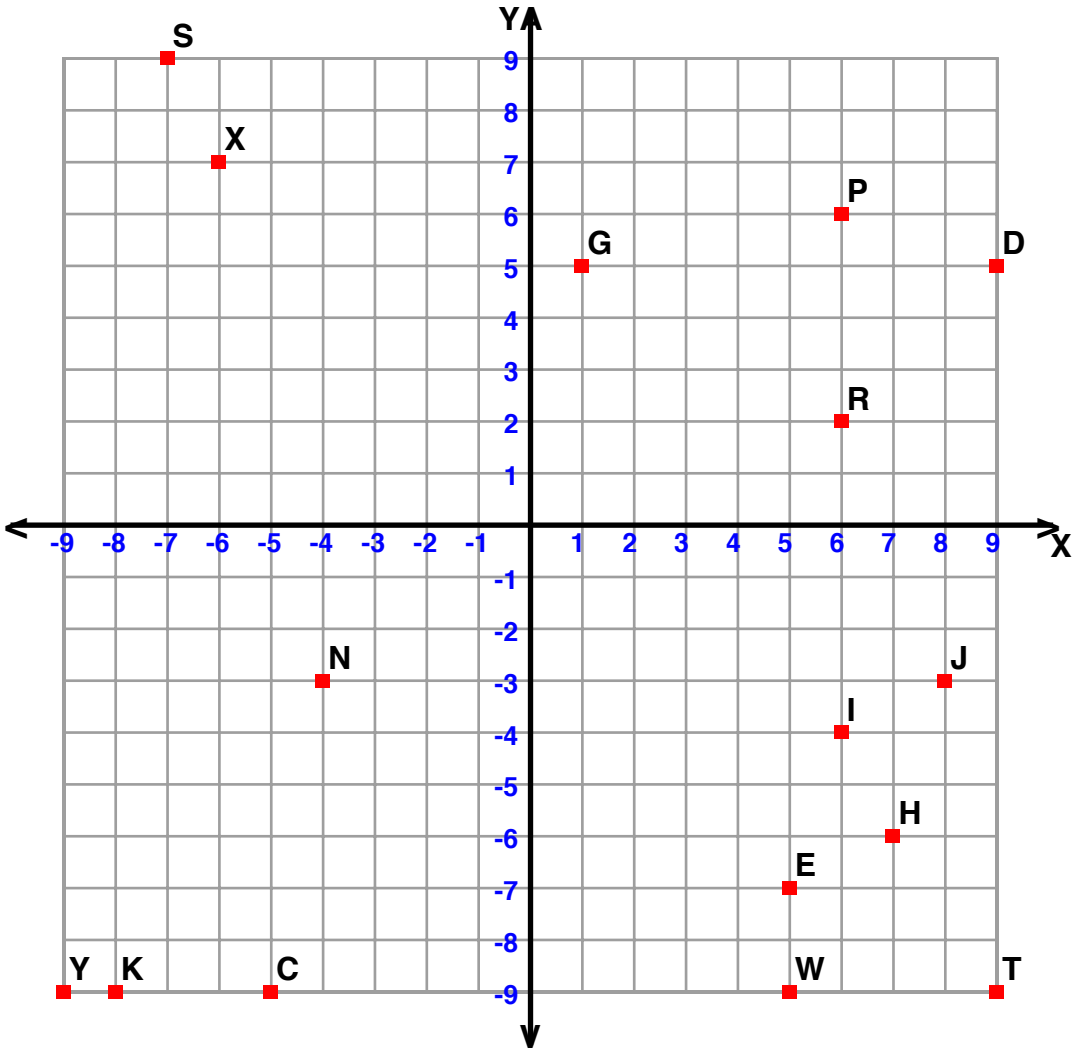
Name : _____ Score : _____

Teacher : _____ Date : _____

Four Quadrant Ordered Pairs



Tell what point is located at each ordered pair.

1) (-4,-3) _____ 3) (+9,+5) _____ 5) (-9,-9) _____ 7) (+1,+5) _____

2) (+7,-6) _____ 4) (-5,-9) _____ 6) (-8,-9) _____ 8) (+5,-7) _____

Write the ordered pair for each given point.

9) **T** _____ 11) **I** _____ 13) **X** _____ 15) **W** _____

10) **J** _____ 12) **R** _____ 14) **P** _____ 16) **S** _____

Plot the following points on the coordinate grid.

17) **A** (+9,+7) 19) **M** (-5,+0) 21) **F** (-6,-5) 23) **O** (+8,-9)

18) **V** (+0,+1) 20) **B** (-2,-6) 22) **L** (+0,-6) 24) **Z** (+4,+5)

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LESSON 14.1

Distance in the Coordinate Plane

COMMON CORE 6.NS.8

Solve...problems by graphing points....Include use of coordinates and absolute value to find distances between points... *Also 6.NS.6b*

ESSENTIAL QUESTION

How can you use absolute value to find the distance between two points with the same *x*- or *y*-coordinates?

EXPLORE ACTIVITY 1 COMMON CORE 6.NS.6b

Reflecting in the Coordinate Plane

A point on a coordinate plane can be *reflected* across an axis. The **reflection** is located on the opposite side of the axis, at the same distance from the axis.

Hold your paper up to the light if necessary to see the reflection.

Draw a coordinate plane on graph paper. Label both axes from −10 to 10.

A Graph (3, −2). Then fold your coordinate plane along the *y*-axis and find the reflection of (3, −2). Record the coordinates of the new point in the table.

B Unfold your coordinate plane. Then fold it along the *x*-axis and find the reflection of (3, −2). Record the coordinates of the new point in the table.

C Choose three additional points and repeat **A** and **B**.

Point	Reflected across *y*-axis	Reflected across *x*-axis
(3, −2)		

Reflect

1. What is the relationship between the coordinates of a point and the coordinates of its reflection across each axis?

_____

_____

_____

2. **Conjecture** A point is reflected across the *y*-axis. Then the reflected point is reflected across the *x*-axis. How will the coordinates of the final point be related to the coordinates of the original point?

_____

_____

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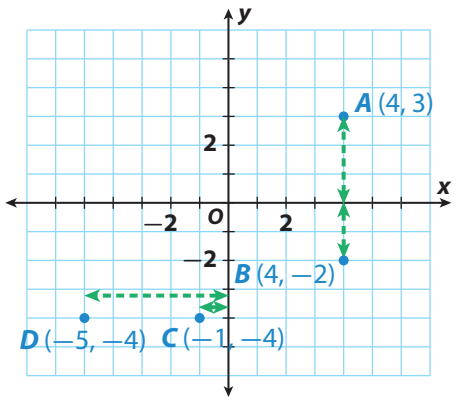
Finding Distances in the Coordinate Plane

You can also use absolute values to find distances between two points that have the same *x*-coordinates or the same *y*-coordinates on a coordinate plane.

EXAMPLE 1

COMMON CORE 6.NS.6b

Find each distance.



A What is the distance between point *A* and point *B*?

STEP 1 Find the distance between point *A* and the *x*-axis.

The *y*-coordinate is 3, so point *A* is $|3|$ units from the *x*-axis.

STEP 2 Find the distance between point *B* and the *x*-axis.

The *y*-coordinate of *B* is -2, so point *B* is $|-2| = 2$ units from the *x*-axis.

STEP 3 Find the sum of the distances.

Distance from *A* to *B* $= |3| + |-2| = 3 + 2 = 5$ units.

B What is the distance between point *D* and point *C*?

STEP 1 Find the distance between point *D* and the *y*-axis.

Point *D* is $|-5| = 5$ units from the *y*-axis.

STEP 2 Find the distance between point *C* and the *y*-axis.

Point *C* is $|-1| = 1$ unit from the *y*-axis.

STEP 3 Find the distance between *C* and *D* by finding this difference:

Distance of *D* from the *y*-axis − distance of *C* from the *y*-axis

$|-5| - |-1| = 4$ units

Math Talk
Mathematical Practices
How is the distance between a point and its reflection across an axis related to the distance between the point and the axis? Explain.

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YOUR TURN

Find the distance between each pair of points.

3. *E*(−4, 7) and *F*(5, 7) _____

4. *G*(0, −5) and *H*(0, −10) _____

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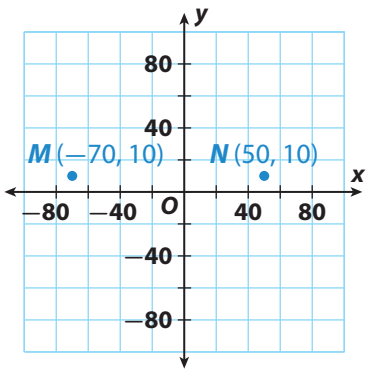
Solving Distance Problems

You can solve problems using the distance between points on a grid.

EXAMPLE 2 Problem Solving

COMMON CORE 6.NS.8

The coordinate plane represents a map. Each grid unit represents 20 miles. A retail company has warehouses at *M*(−70, 10) and *N*(50, 10). How long does it take a truck that drives 40 miles per hour to travel from warehouse *M* to warehouse *N*?



Analyze Information

Identify the important information.

- One warehouse is located at *M*(−70, 10). The other is at *N*(50, 10).
- A truck drives from *M* to *N* at a speed of 40 miles per hour.

Formulate a Plan

- Find the distance between *M* and *N* by adding the absolute values of the *x*-coordinates of the points.
- Find the time it takes the truck to drive this distance by using the relationship, distance = rate · time.

Solve

Add the absolute values of the *x*-coordinates to find the distance between point *M* and point *N* on the grid.

$$|-70| + |50| = 70 + 50 = 120$$

The warehouses are 120 miles apart.

The truck drives 120 miles at 40 mi/h. Because 120 = 40(3), it takes the truck 3 hours to travel from *M* to *N*.

Justify and Evaluate

You found the sum of the absolute values of the *x*-coordinates to find the horizontal distance on the grid. Then you used distance = rate · time to find the time it takes to drive that distance.

YOUR TURN

5. A store is located at *P*(50, −30). How long will it take a truck driving at 50 miles per hour to drive from warehouse *N* to this store?

_____

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Guided Practice

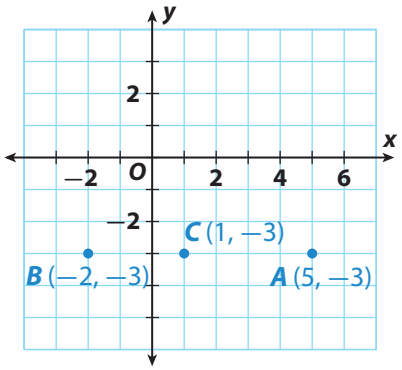
1. The point (5, −2) is reflected across the *x*-axis. What are the coordinates of the reflection? (Explore Activity)

_____

2. The point (−6, 8) is reflected across the *y*-axis. What are the coordinates of the reflection? (Explore Activity)

_____

Use the coordinate plane. (Example 1)



3. The distance between point *A* and point *B* is

$|\square| + |\square| = \square + \square = \square$ units.

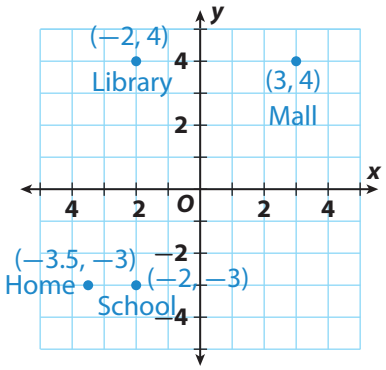
4. The distance between point *A* and point *C* is

$|\square| - |\square| = \square - \square = \square$ units.

5. Plot the reflection of point *C* across the *y*-axis.
What is the distance between point *C* and its reflection? _____

6. Plot the reflection of point *A* across the *x*-axis.
What is the distance of the reflection from the *x*-axis? _____

Use the map shown. Each grid on the map represents 1 city block. (Example 2)



7. Yoko walks from the library to the mall.
How many city blocks does she walk? _____

8. If Yoko walks 1 block in 3 minutes, how long does it take her to walk from the school to the library? How long does it take her to walk from home to school?

_____

ESSENTIAL QUESTION CHECK-IN

9. How do you use absolute value to find the distance between two points that have the same *x*-coordinates but different *y*-coordinates?

_____

_____

_____

_____

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LESSON
14.2 Polygons in the Coordinate Plane

COMMON CORE 6.G.3

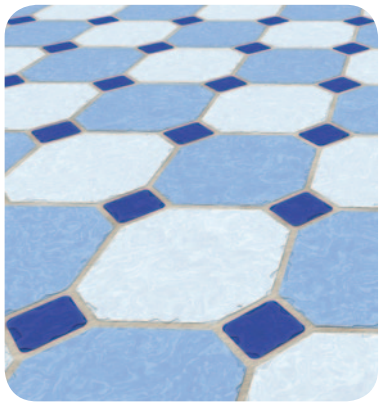
Draw polygons in the coordinate plane;…find the length of a side… in the context of solving… problems.

ESSENTIAL QUESTION

How can you solve problems by drawing polygons in the coordinate plane?

EXPLORE ACTIVITY Real World

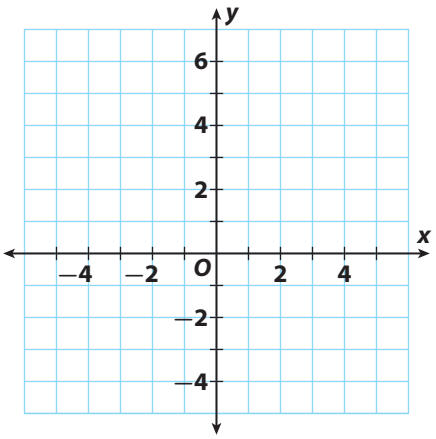
COMMON CORE 6.G.3



Polygons in the Coordinate Plane

A **polygon** is a closed plane figure formed by three or more line segments that meet only at their endpoints. A **vertex** is the point where two sides of a polygon meet. The *vertices* of a polygon can be represented as ordered pairs, and the polygon can then be drawn in the coordinate plane.

Sheila wants to make a pattern of two different tile shapes on a floor. She first graphs the shapes on a coordinate plane.



A Plot these points to form one of the tile shapes:

$A(3, 5)$, $B(4, 6)$, $C(5, 5)$, $D(4, 4)$

Connect the points in order.

The polygon formed is a(n) _____.

B Plot these points to form the other tile shape:

$P(-5, 2)$, $Q(-4, 3)$, $R(0, 3)$, $S(1, 2)$,

$T(1, -2)$, $U(0, -3)$, $V(-4, -3)$, $W(-5, -2)$

Connect the points in order.

The polygon formed is a(n) _____.

Reflect

1. How is the number of vertices related to the number of sides of the polygon and to the type of polygon? Give two examples.

_____

_____

_____

_____

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Finding Perimeter in the Coordinate Plane

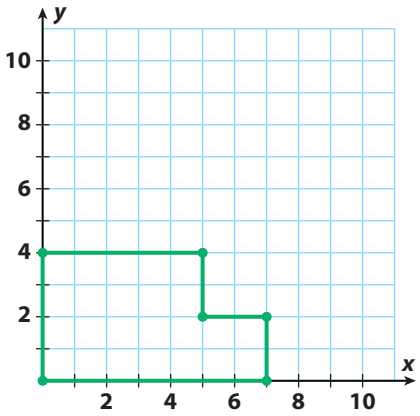
You can use what you know about finding lengths in the coordinate plane to find the perimeter of a polygon.

EXAMPLE 1

Real World

COMMON CORE 6.G.3

The grid shows the path Tommy followed when he walked from his home at (0, 0) to various locations and back home again. If each grid square represents one block, how many blocks did he walk?



Home (0, 0)

Library (0, 4)

Park (5, 4)

Friend's house (5, 2)

Pond (7, 2)

Store (7, 0)

Math Talk
Mathematical Practices
How do you find the distance between two points in the same quadrant that have the same *x*-coordinate?

STEP 1 Find each distance. Each grid unit represents one block.

Tommy's home (0, 0) to the library (0, 4) is $|4| - 0 = 4 - 0 = 4$ blocks.

The library (0, 4) to the park (5, 4) is $|5| - 0 = 5 - 0 = 5$ blocks.

The park (5, 4) to Tommy's friend's house (5, 2) is $|4| - |2| = 4 - 2 = 2$ blocks.

Tommy's friend's house (5, 2) to the pond (7, 2) is $|7| - |5| = 7 - 5 = 2$ blocks.

The pond (7, 2) to the store (7, 0) is $|2| - 0 = 2 - 0 = 2$ blocks.

The store (7, 0) to Tommy's home (0, 0) is $|7| - 0 = 7 - 0 = 7$ blocks.

STEP 2 Find the sum of the distances.

Tommy walked $4 + 5 + 2 + 2 + 2 + 7 = 22$ blocks.

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YOUR TURN

2. Suppose the next day Tommy walks from his home to the mall at (0, 8), and then walks to a movie theater at (7, 8). After leaving the theater Tommy walks to the store at (7, 0) before returning home.

How far does he walk? _____ blocks

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Finding Area in the Coordinate Plane

You can use familiar area formulas to find areas of polygons in the coordinate plane.

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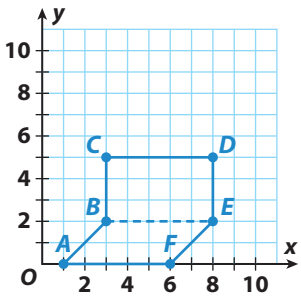
EXAMPLE 2

Real World

COMMON CORE 6.G.3

Caleb is planning a new deck for his house. He graphs the deck as polygon *ABCDEF* on a coordinate plane in which each grid unit represents one foot. The vertices of the polygon are *A*(1, 0), *B*(3, 2), *C*(3, 5), *D*(8, 5), *E*(8, 2), and *F*(6, 0). What is the area of Caleb's deck?



STEP 1 Graph the vertices, and connect them in order.

Draw a horizontal dashed line segment to divide the polygon into two quadrilaterals—a rectangle and a parallelogram.

STEP 2 Find the area of the rectangle using the length of segment *BE* as the base *b* and the length of segment *BC* as the height *h*.

$b = |8| - |3| = 5$ feet $\qquad h = |5| - |2| = 3$ feet

$A = bh = 5 \cdot 3 = 15$ square feet

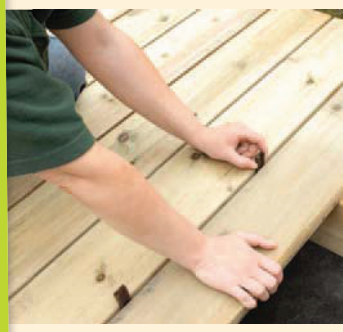
STEP 3 Find the area of the parallelogram using the length of segment *AF* as the base. Use the length of a segment from *F*(6, 0) to the point (6, 2) as the height *h*.

$b = |6| - |1| = 5$ feet $\qquad h = |2| - 0 = 2$ feet

$A = bh = 5 \cdot 2 = 10$ square feet

STEP 4 Add the areas to find the total area of the deck.

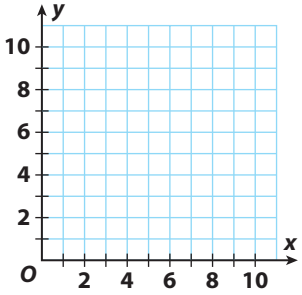
$A = 15 + 10 = 25$ square feet



YOUR TURN

3. The vertices of a polygon are *L*(1, 2), *M*(1, 6), *N*(7, 6), *O*(7, 2), *P*(5, 0), and *Q*(3, 0). Graph the polygon. Then find its area.

$A =$ _____ square units



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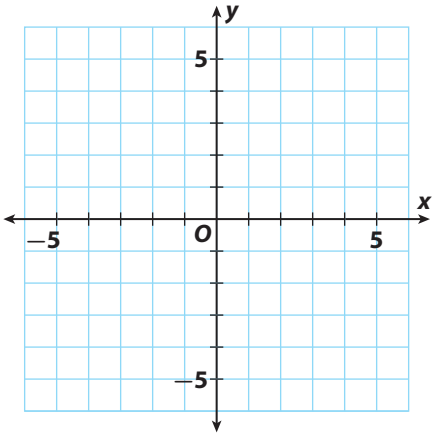
Guided Practice

A gardener uses a coordinate grid to design a new garden. The gardener uses polygon *WXYZ* on the grid to represent the garden. The vertices of this polygon are *W*(3, 3), *X*(−3, 3), *Y*(−3, −3), and *Z*(3, −3). Each grid unit represents one yard.



1. Graph the points, and connect them in order. What is the shape of the garden? (Explore Activity)

_____

2. How much fencing will the gardener need to enclose the garden? (Example 1)

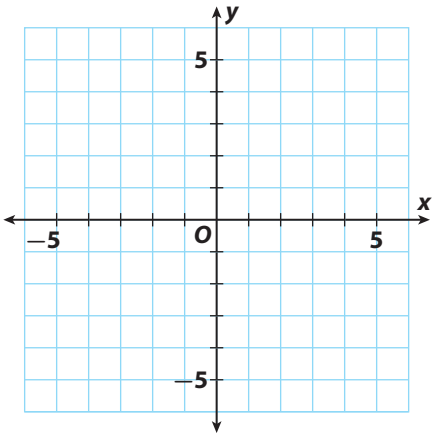
Each side of the garden is _____ yards in length.

The gardener will need _____ yards of fencing to enclose the garden.

3. What is the area of the garden? (Example 2)

_____

4. A clothing designer makes letters for varsity jackets by graphing the letters as polygons on a coordinate plane. One of the letters is polygon *ABCDEF*. The vertices of this polygon are *A*(3, −2), *B*(3, −4), *C*(−3, −4), *D*(−3, 4), *E*(−1, 4), and *F*(−1, −2). Each grid unit represents one inch. Graph the points on the coordinate plane, and connect them in order. Identify the letter formed. Then find its area. (Example 2)



_____

ESSENTIAL QUESTION CHECK-IN

5. How can you use a coordinate plane to solve perimeter and area problems?

_____

_____

_____

_____

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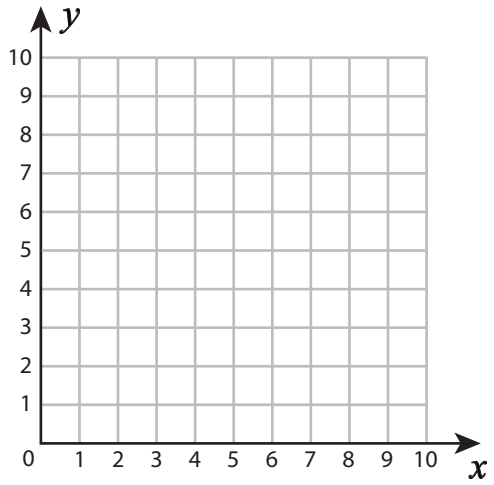
Name : _____ Score : _____

Positive: S1

Plotting Points - Shapes

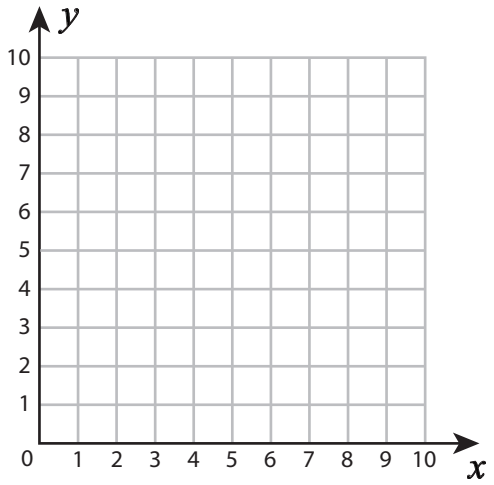
Plot and join the points in the given order. Complete the figure by joining the end points. Identify the shape.

1) (2, 8), (3, 9), (5, 9), (6, 8), (5, 7), (3, 7)



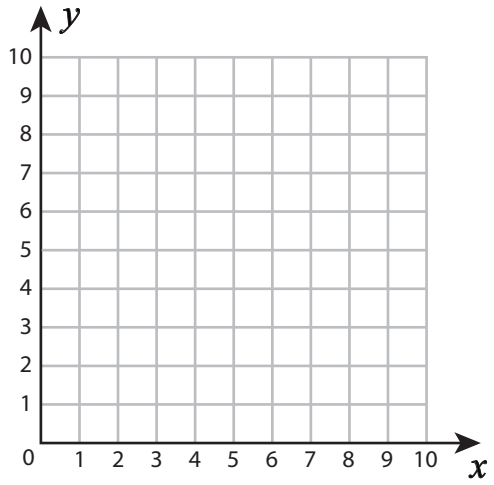
Shape: _____

2) (5, 5), (9, 5), (9, 1), (5, 1)



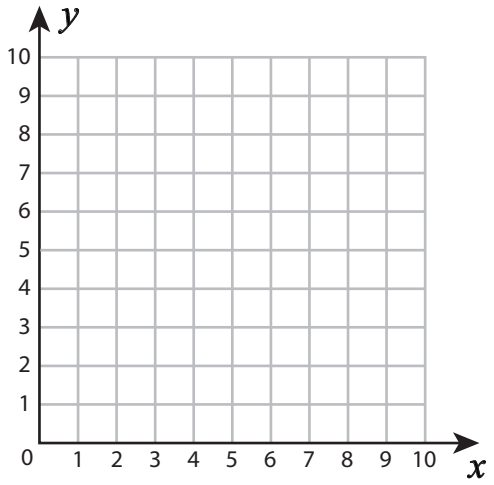
Shape: _____

3) (2, 4), (3, 7), (7, 7), (6, 4)



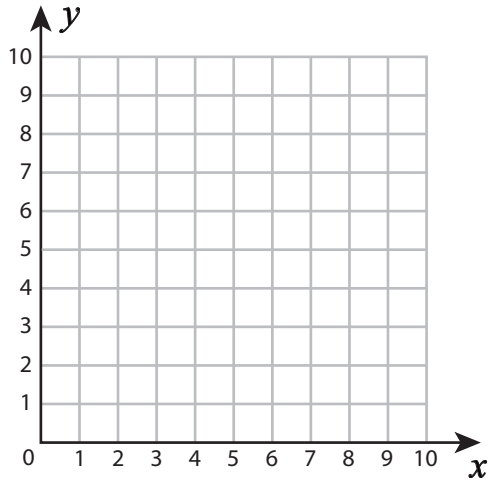
Shape: _____

4) (3, 9), (7, 5), (3, 2)



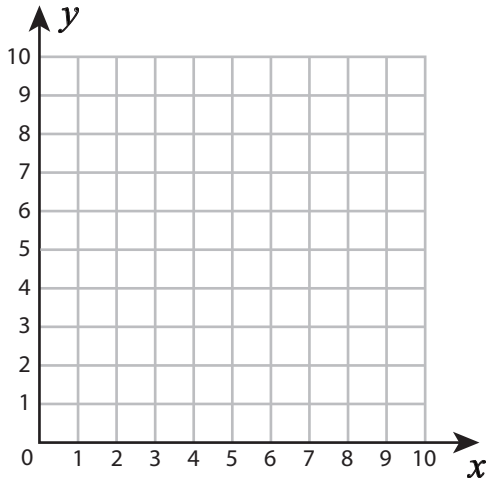
Shape: _____

5) (2, 7), (8, 7), (8, 3), (2, 3)



Shape: _____

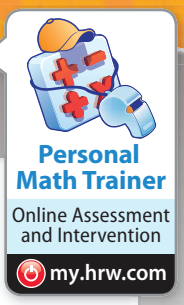
6) (4, 7) , (7, 7) , (10, 4) , (1, 4)



Shape: _____

MODULE QUIZ

Ready to Go On?



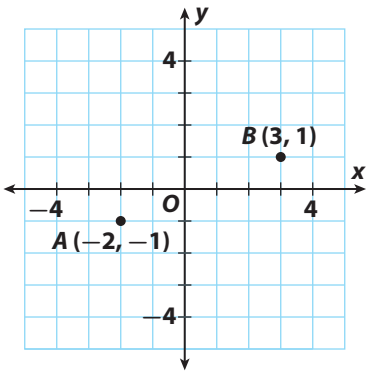
14.1 Distance in the Coordinate Plane

1. Reflect *A* across the *x*-axis. Label the reflection as *N*, and give its coordinates on the graph.

2. Reflect *B* across the *x*-axis. Label the reflection as *M*, and give its coordinates on the graph.

3. The distance between *A* and *N* is _____.

4. Suppose the graph represents a map in which each grid unit equals 1 mile. If a school is located at *B* and a library is located at *N*, what is the distance between the school and the library? _____



Find the coordinates of the point for each reflection.

5. (−5, 7) across the *x*-axis _____

6. (2, 5.5) across the *y*-axis _____

Find the distance between each pair of points.

7. (1, 1) and (1, −2) _____ units

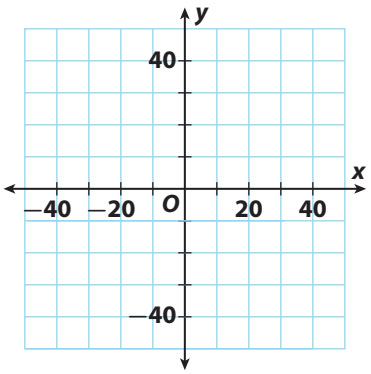
8. (−2, 3) and (−4, 3) _____ units

14.2 Polygons in the Coordinate Plane

9. On the coordinate plane shown, each grid unit represents 10 feet. Polygon *QRST* has vertices *Q*(10, 20), *R*(−10, 20), *S*(−10, −10), and *T*(10, −10), and represents the floor plan of a room. Find the perimeter and area of the room.

_____

_____



ESSENTIAL QUESTION

10. Suppose you are given the coordinates of the vertices of a polygon. What steps could you take to solve a problem involving the polygon's area?

_____

_____

_____

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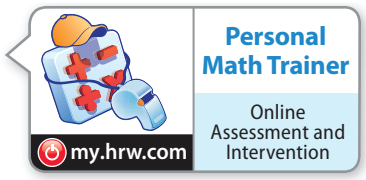
COMMON CORE

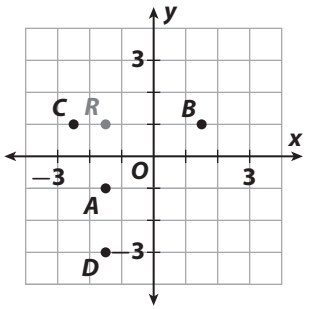
MODULE 14 MIXED REVIEW

Assessment Readiness



Selected Response

1. Which point is a reflection of point *R* across the *x*-axis?

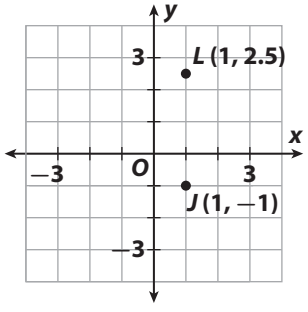


Ⓐ Point *A*
Ⓒ Point *C*
Ⓑ Point *B*
Ⓓ Point *D*

2. Which point is a reflection of (12, −8) across the *y*-axis on a coordinate plane?

Ⓐ (−12, −8)
Ⓒ (8, 12)
Ⓑ (−8, 12)
Ⓓ (12, 8)

3. What is the distance between points *J* and *L* on the grid?



Ⓐ 1.5 units
Ⓒ 3 units
Ⓑ 2 units
Ⓓ 3.5 units

4. What is the greatest common factor of 12 and 30?

Ⓐ 2
Ⓒ 6
Ⓑ 3
Ⓓ 12

5. What is the distance between two points located at (−6, 2) and (−6, 8) on a coordinate plane?

Ⓐ 4 units
Ⓒ 10 units
Ⓑ 6 units
Ⓓ 12 units

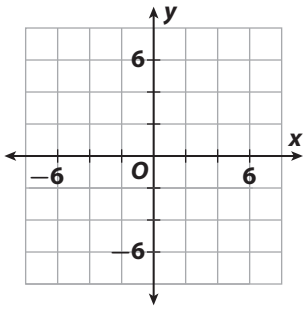
6. Which is the sum of $\frac{1}{12} + \frac{3}{8}$?

Ⓐ $\frac{1}{6}$
Ⓒ $\frac{11}{48}$
Ⓑ $\frac{1}{5}$
Ⓓ $\frac{11}{24}$

Mini-Task

7. An artist is laying out the design for a wall hanging on a coordinate plane. She uses polygon *EFGH* with vertices *E*(4, 4), *F*(−4, 4), *G*(−4, −4), and *H*(4, −4) to represent the finished piece. Each unit on the grid represents two feet.

a. Plot the polygon on the grid, and classify its shape.



Name of Polygon: _____

b. How much area will the art cover on a wall? _____

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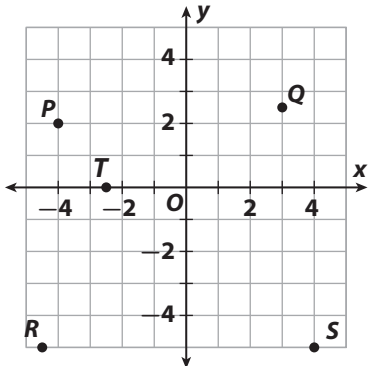
MODULE 12

LESSON 12.1

Your Turn

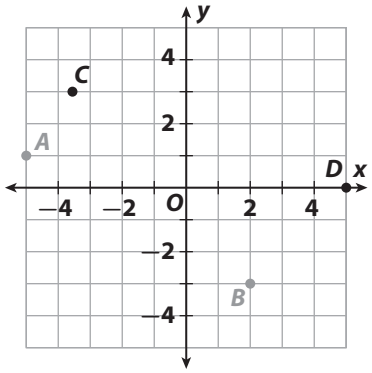
4. $G(4, -4)$; IV; $E(-2, 4)$; II
5. $F(3, 2)$; I; $H(-1, -3)$; III
6–10.



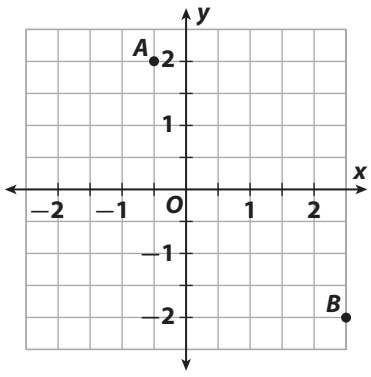
11. Ted (−20, −20), Ned (−20, 30)

Guided Practice

1. left; up; (−5, 1); II **2.** 2; 3; (2, −3); IV
3–4.



5. Each grid square is $\frac{1}{2}$ unit on a side.
6–7.



Independent Practice

11. Sam is 3 km south and 7 km east of the theater.
13. (−3, 0.5) **15.** $W(-0.75, -1.0)$

LESSON 12.2

Your Turn

8. Sample answer: Bridget's grandmother gave her a collection of 15 perfume bottles. Bridget adds one bottle per week to the collection. The independent variable is the number of weeks. The dependent variable is the number of perfume bottles in her collection. The value of y is always 15 units greater than the value of x.
9. Sample answer: Colin created a website to sell T-shirts that are printed with funny slogans. He makes $16 per T-shirt. The independent variable is the number of T-shirts he sells, and the dependent variable is his profit in dollars. As the independent variable increases by 1, the dependent variable increases by 16. **10.** Sample answer: Tickets to the school musical cost $3 each. The independent variable is the number of tickets purchased, and the dependent variable is the total cost. The value of y is always 3 times the value of x.

Guided Practice

1. Time is the independent variable and cost is the dependent variable.
2a.

Time x (h)	0	1	2	2
Distance y (mi)	0	60	120	180

b. Time is the independent variable and distance is the dependent variable. **c.** The value of y is always 60 times the value of x. **3.** The value of the dependent variable is 5 times the value of the independent variable.

Independent Practice

7a. number of markers **b.** number of gift bags **c.** The relationship is multiplicative because y increases by a factor of 5 as x increases by 1. **d.** The number of glitter markers is 5 times the number of gift bags.

LESSON 12.3

Your Turn

2. $y = x - 2$ **3.** $y = 2.5x$ **4.** $y = x + 5$
5. $y = 2x$ **6.** $k = r + 5$; 57 years old

Guided Practice

1. $y = x - 4$ **2.** $y = 4x$ **3.** $y = x + 3$
4. $y = \frac{x}{6}$
5. $c = 1.35n$; $33.75

Independent Practice

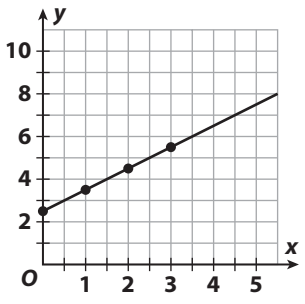
9. The y-value is $\frac{1}{4}$ of the x-value.
11a. $e = 8.25h$ **b.** $206.25 = 8.25h$; $25 = h$; 25 hours **13.** Not possible; there is no consistent pattern between the y-values and corresponding x-values.
15. No

LESSON 12.4

Your Turn

4.

x	$x + 2.5 = y$	(x, y)
0	$0 + 2.5 = 2.5$	(0, 2.5)
1	$1 + 2.5 = 3.5$	(1, 3.5)
2	$2 + 2.5 = 4.5$	(2, 4.5)
3	$3 + 2.5 = 5.5$	(3, 5.5)



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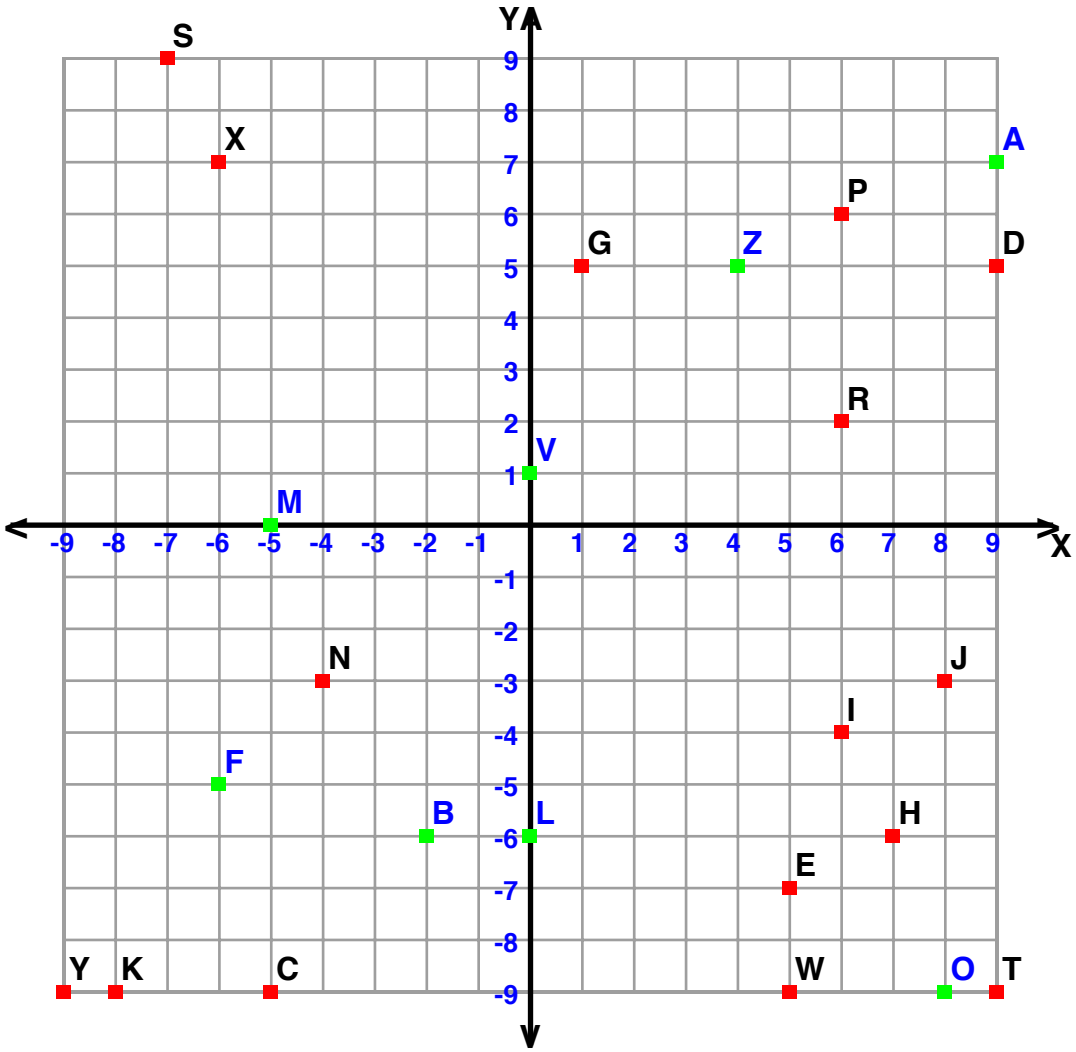
Name : _____ Score : _____

Teacher : _____ Date : _____

Four Quadrant Ordered Pairs



Tell what point is located at each ordered pair.

1) (-4,-3) N
2) (+7,-6) H
3) (+9,+5) D
4) (-5,-9) C
5) (-9,-9) Y
6) (-8,-9) K
7) (+1,+5) G
8) (+5,-7) E

Write the ordered pair for each given point.

9) **T** (+9,-9)
10) **J** (+8,-3)
11) **I** (+6,-4)
12) **R** (+6,+2)
13) **X** (-6,+7)
14) **P** (+6,+6)
15) **W** (+5,-9)
16) **S** (-7,+9)

Plot the following points on the coordinate grid.

17) **A** (+9,+7)
18) **V** (+0,+1)
19) **M** (-5,+0)
20) **B** (-2,-6)
21) **F** (-6,-5)
22) **L** (+0,-6)
23) **O** (+8,-9)
24) **Z** (+4,+5)

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UNIT 6 Selected Answers

MODULE 13

LESSON 13.1

Your Turn

2. 366 **3.** 210 **4.** 66.5 **5.** 90 **6.** 165

Guided Practice

1. 13; 9; 117 **2.** 14; 9; 15; 168
3. 18; 11; 99

Independent Practice

5. 84 cm^2 **7.** 936 in^2 **9.** 72 m^2
11. 8.25 ft^2 **13.** 1,620 in^2 **15.** 57 ft^2
17. 9 in. and 15 in.

LESSON 13.2

Your Turn

3. 59.5 in^2 **5.** 12 ft^2

Guided Practice

1. 14; 8; 56 **2.** 12; 30; 80

Independent Practice

5. 240 ft^2 **7.** 288 ft^2 **9.** 71.5 in^2
11. 20 ft^2 **13.** Monica forgot to multiply by $\frac{1}{2}$. The area of the fabric is 45 in^2. **17a.** 6 in. **b.** 1 in. and 36 in., 2 in. and 18 in., 3 in. and 12 in., 4 in. and 9 in.

LESSON 13.3

Your Turn

1. 8 in. **3.** 4 ft **4.** 8 pallets

Guided Practice

1. $70 = \frac{1}{2}\left(8\frac{3}{4}\right) b$; 16 in. **2.** $791 = \frac{1}{2}h(26.5 + 30)$; 28 centimeters
3. area; $A = 42(28) = 1{,}176$ ft^2; number of gallons of paint; $n = 1{,}176 \div 350 = 3.36$; 4

Independent Practice

5. $5\frac{1}{2}$ ft **7.** 1.2 cm **9.** 16 in. and 8 in. **11.** 128 patches **13a.** 702 ft^2
b. 1,458 ft^2 **c.** 486 ft^2 **15a.** $3\frac{1}{2}$ *yd*
b. $10\frac{2}{3}$ yd^2

LESSON 13.4

Your Turn

3. 44 square meters
4. 567 square inches
5. $3,348

Guided Practice

1. $\frac{1}{8}$ square unit **2.** 112 **3.** 196
4. 240 square feet; 3 cans of paint

Independent Practice

7a. about 60% **b.** $321.75
9a. 73.5 square inches
b. 21 inches by 21 inches
c. 8 banners; yes
11. 50 square inches

MODULE 14

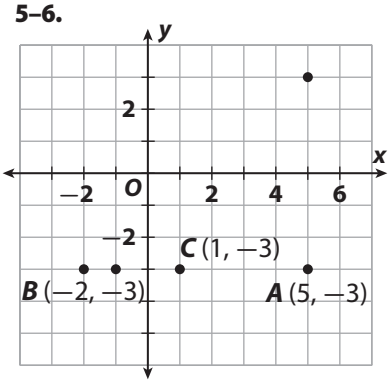
LESSON 14.1

Your Turn

3. 9 units **4.** 5 units
5. 0.8 hours, or 48 minutes

Guided Practice

1. (5, 2) **2.** (6, 8) **3.** $|5| + |-2| = 5 + 2 = 7$ **4.** $|5| - |1| = 5 - 1 = 4$
5. 2 units **6.** 3 units
5–6.



7. 5 blocks
8. 21 minutes; 4.5 minutes

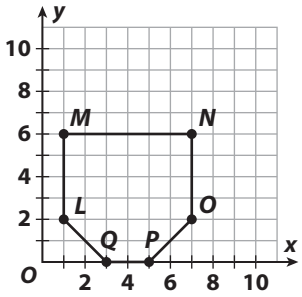
Independent Practice

11. Place another point on the other side of the y-axis the same distance from the y-axis as point *A*; (−1.5, −2.5); 3 units
13. (7, −3); 14 units **15.** (−2.4, −1); 4.8 units **17.** 3 hours

LESSON 14.2

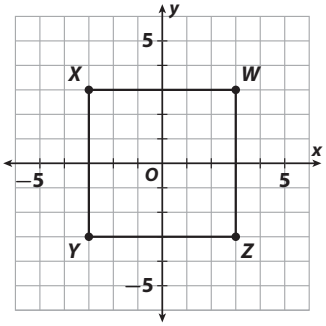
Your Turn

2. 30 blocks **3.** 32 square units

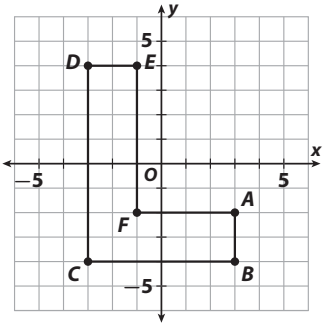


Guided Practice

1. square



2. 6; 24 **3.** 36 square yards
4. L; 24 square inches



Independent Practice

7a. hexagon **b.** 18 units
c. trapezoid; 15 units
11. The octagon is a regular octagon, so all the sides will have the same length as the side whose endpoints are given. Since that side length $= |4| - |1| = 3$ units, the perimeter of the octagon is $8(3) = 24$ units.

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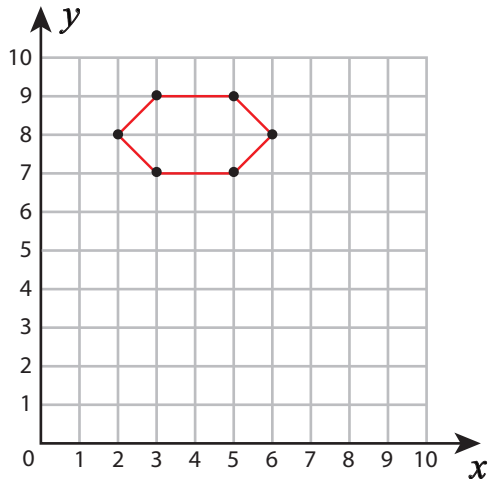
Name : _____ **Answer key** Score : _____

Positive: S1

Plotting Points - Shapes

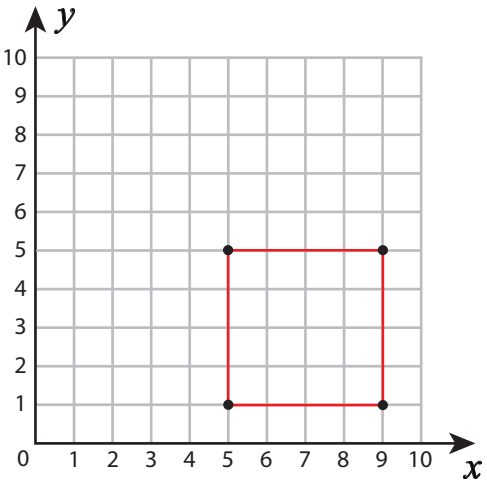
Plot and join the points in the given order. Complete the figure by joining the end points. Identify the shape.

1) (2, 8), (3, 9), (5, 9), (6, 8), (5, 7), (3, 7)



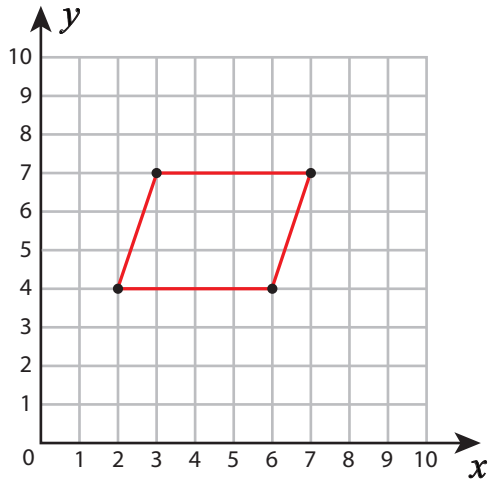
Shape: **Hexagon**

2) (5, 5), (9, 5), (9, 1), (5, 1)



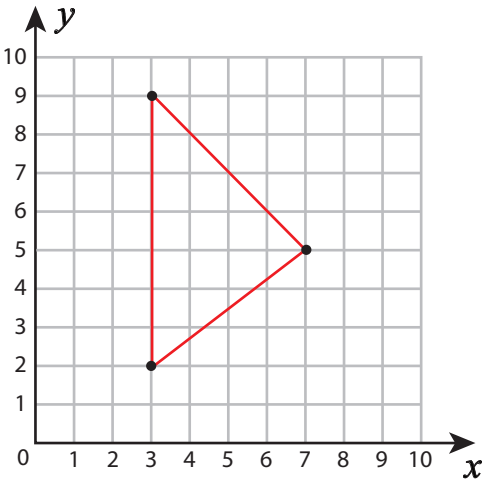
Shape: **Square**

3) (2, 4), (3, 7), (7, 7), (6, 4)



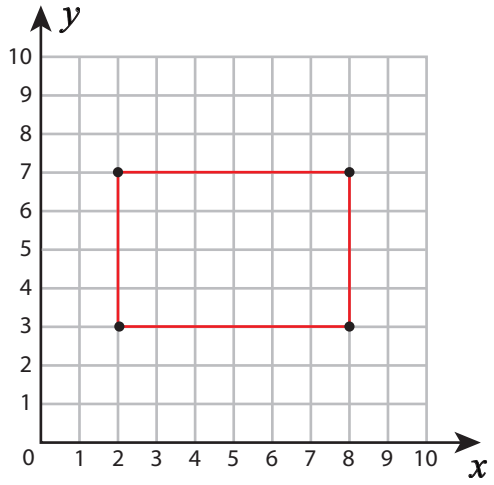
Shape: **Parallelogram**

4) (3, 9), (7, 5), (3, 2)



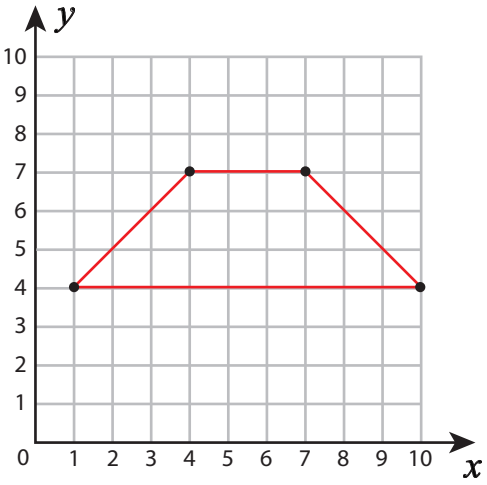
Shape: **Triangle**

5) (2, 7), (8, 7), (8, 3), (2, 3)



Shape: **Rectangle**

6) (4, 7) , (7, 7) , (10, 4) , (1, 4)



Shape: **Trapezoid**