

# GO MATH Unit 1-3

# 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

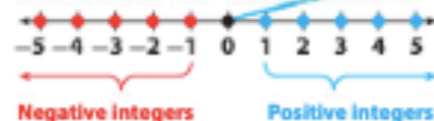


**COMMON CORE 6.NS.5, 6.NS.6**

## 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.

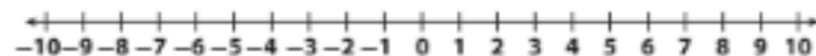
The number 0 is neither positive nor negative.



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.

- Q** **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? \_\_\_\_\_

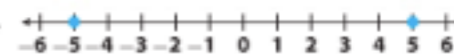


### EXPLORE ACTIVITY 2

**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.



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

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

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.

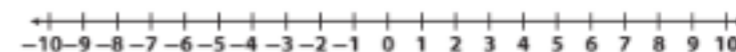
- A** Use your number line to find the opposites of 7, -6, 1, and 9. \_\_\_\_\_
- B** How does your number line show that 0 is its own opposite? \_\_\_\_\_
- C** What is the opposite of the opposite of 3? \_\_\_\_\_

## 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. \_\_\_\_\_

- 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? \_\_\_\_\_

## 1.1 Independent Practice

6.NS.5, 6.NS.6, 6.NS.6a, 6.NS.6c



- 12. Chemistry** Atoms normally have an electric charge of 0. Certain conditions, such as static, can cause atoms to have a positive or a negative charge. Atoms with a positive or negative charge are called *ions*.

Ion	A	B	C	D	E
Charge	-3	+1	-2	+3	-1

- Which ions have a negative charge?
- Which ions have charges that are opposites?
- Which ion's charge is not the opposite of another ion's charge?

**Name the integer that meets the given description.**

- the opposite of  $-17$
- 4 units left of 0
- the opposite of the opposite of 2
- 15 units right of 0
- 12 units right of 0
- the opposite of  $-19$

- 19. Analyze Relationships** Several wrestlers are trying to lose weight for a competition. Their change in weight since last week is shown in the chart.

Wrestler	Tino	Victor	Ramsey	Baxter	Luis
Weight Change (in pounds)	-2	6	2	5	-5

- Did Victor lose or gain weight since last week?
- Which wrestler's weight change is the opposite of Ramsey's?
- Which wrestlers have lost weight since last week?
- Frankie's weight change since last week was the opposite of Victor's. What was Frankie's weight change?
- Frankie's goal last week was to gain weight. Did he meet his goal? Explain.

## EXPLORE ACTIVITY



6.NS.7, 6.NS.7a

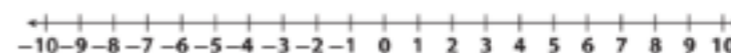
## Comparing Positive and Negative Integers

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

- Graph the win/loss combined record for each team on the number line.
- Which team had the best record in the league? How do you know?
- Which team had the worst record? How do you know?



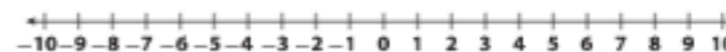
## Reflect

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

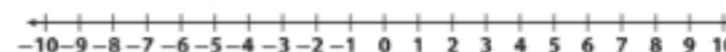
## YOUR TURN

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

- | Change in Stock Price (\$) |   |   |    |    |   |
|----------------------------|---|---|----|----|---|
| -5                         | 4 | 0 | -3 | -6 | 2 |



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



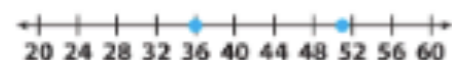
## EXAMPLE 2



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.



### Math Talk

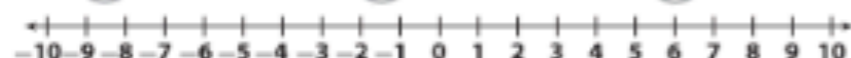
#### Mathematical Practices

Is there a greatest integer?  
Is there a greatest negative integer? Explain.

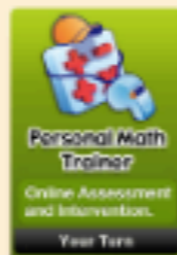
## YOUR TURN

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

4.  $-10$    $-2$       5.  $-6$    $6$       6.  $-7$    $-8$



7. Write two inequalities to compare  $-2$  and  $-18$ .  
8. Write two inequalities to compare  $39$  and  $-39$ .



Lesson 1.2 15

## Guided Practice

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

City	A	B	C	D	E
Temperature ( $^{\circ}\text{F}$ )	$-9$	$10$	$-2$	$0$	$4$



- b. Which city was coldest? \_\_\_\_\_  
c. Which city was warmest? \_\_\_\_\_

- Q** 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  $-22$ . \_\_\_\_\_

- Q** 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.  $-2$    $-6$

- Q** 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 ( $^{\circ}\text{C}$ )	$-3$	$0$	$-2$	$2$	$-4$

- a. Alexandria and Winona \_\_\_\_\_  
b. Redwood Falls and International Falls \_\_\_\_\_



### ESSENTIAL QUESTION CHECK-IN

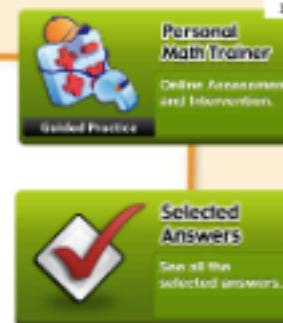
- Q** 14. How can you use a number line to compare and order numbers?

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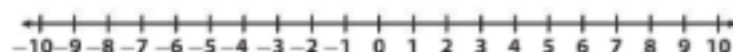
## 1.2 Independent Practice

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

- 15. Multiple Representations** A hockey league tracks the plus-minus records for each player. A plus-minus record is the difference in even strength goals for and against the team when a player is on the ice. The following table lists the plus-minus values for several hockey players.

Player	A. Jones	B. Sutter	E. Simpson	L. Mays	R. Tomas	S. Klatt
Plus-minus	-8	4	9	-3	-4	3

- a. Graph the values on the number line.



- b. Which player has the best plus-minus record? \_\_\_\_\_

- Astronomy** The table lists the average surface temperature of some planets. Write an inequality to compare the temperatures of each pair of planets.

16. Uranus and Jupiter \_\_\_\_\_  
 17. Mercury and Mars \_\_\_\_\_  
 18. Arrange the planets in order of average surface temperature from greatest to least. \_\_\_\_\_

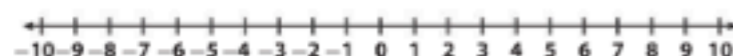
Planet	Average Surface Temperature (°C)
Mercury	167
Uranus	-197
Neptune	-200
Earth	15
Mars	-65
Jupiter	-110

- 19. Represent Real-World Problems** For a stock market project, five students each invested pretend money in one stock. They tracked gains and losses in the value of that stock for one week. In the following table, a gain is represented by a positive number and a loss is represented by a negative number.

Students	Andre	Bria	Carla	Daniel	Ethan
Gains and Losses (\$)	7	-2	-5	2	4

Graph the students' results on the number line. Then list them in order from least to greatest.

- a. Graph the values on the number line.



- b. The results listed from least to greatest are \_\_\_\_\_



## Practice

- Q** Decide what numbering interval to use when labeling the number line for each set of numbers and explain your reasoning.

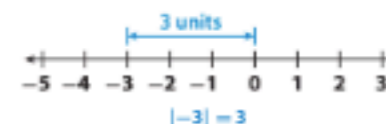
- 0.60, 0.75, 0.80, 0.90 \_\_\_\_\_
- 25, 40, 50, 85 \_\_\_\_\_
- How many tick marks do you need to display the numbers 2, 6, 10, 16, and 18 on a number line using an interval of 2? \_\_\_\_\_
- Construct a number line to display the numbers -10, 0, 5, 15, and -5. \_\_\_\_\_

## EXPLORE ACTIVITY 1

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

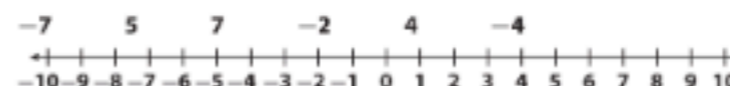
### Finding Absolute Value

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

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



### YOUR TURN

4. The temperature at night reached  $-13^{\circ}\text{F}$ . 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.  $|1|$  \_\_\_\_\_



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### EXPLORE ACTIVITY 2



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.

### Guided Practice



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



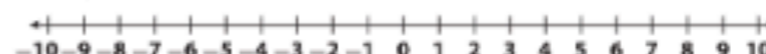
2. If Ryan pays his car insurance for the year in full, he will get a credit of \$28. If he chooses to pay a monthly premium, he will pay a \$10 late fee for any month that the payment is late. (Explore Activity 1, Example 1)

- 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, and Sinea 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?



\_\_\_\_\_



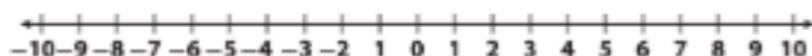
# Ready to Go On?



## 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

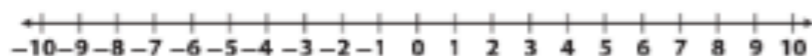
4. -2, 8, -15, 5, 3, 1 \_\_\_\_\_

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?



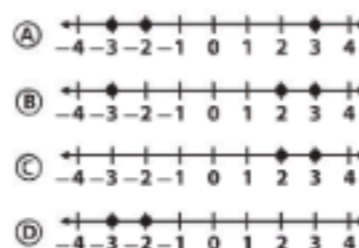
## MODULE 1 MIXED REVIEW

## Assessment Readiness



## Selected Response

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



2. What is the opposite of -3?

- (A) 3 (B) 0 (C)  $-\frac{1}{3}$  (D)  $\frac{1}{3}$

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

- (A) 20 feet below sea level  
(B) 20 feet above sea level  
(C) 2 feet below sea level  
(D) At sea level

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

- (A) 0 (B) -1 (C) 1 (D) 55

5. In Bangor it is  $-3^{\circ}\text{F}$ , in Fairbanks it is  $-12^{\circ}\text{F}$ , in Fargo it is  $-8^{\circ}\text{F}$ , and in Calgary it is  $-15^{\circ}\text{F}$ . In which city is it the coldest?

- (A) Bangor (B) Fairbanks (C) Fargo (D) Calgary

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

- (A) 20, 6, -2, -13 (B) -2, 6, -13, 20 (C) -13, -2, 6, 20 (D) 20, -13, 6, -2

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

- (A) Graph the integers, then read them from left to right.  
(B) Graph the integers, then read them from right to left.  
(C) Graph the absolute values of the integers, then read them from left to right.  
(D) 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?  
\_\_\_\_\_  
\_\_\_\_\_

# Are YOU Ready?

Complete these exercises to review skills you will need for this module.

## Multiples

**EXAMPLE**  $5 \times 1 = 5$     $5 \times 2 = 10$     $5 \times 3 = 15$     $5 \times 4 = 20$     $5 \times 5 = 25$

To find the first five multiples of 5, multiply 5 by 1, 2, 3, 4, and 5.

**Q** List the first five multiples of the number.

1. 7 \_\_\_\_\_ 2. 11 \_\_\_\_\_ 3. 15 \_\_\_\_\_

## Factors

**EXAMPLE**  $1 \times 12 = 12$   
 $2 \times 6 = 12$   
 $3 \times 4 = 12$   
 The factors of 12 are 1, 2, 3, 4, 6, 12.

To find the factors of 12, use multiplication facts of 12. Continue until pairs of factors repeat.

**Q** Write all the factors of the number.

4. 24 \_\_\_\_\_ 5. 36 \_\_\_\_\_  
 6. 45 \_\_\_\_\_ 7. 32 \_\_\_\_\_

## Multiplication Properties (Distributive)

**EXAMPLE**  $7 \times 14 = 7 \times (10 + 4)$   
 $= (7 \times 10) + (7 \times 4)$   
 $= 70 + 28$   
 $= 98$

To multiply a number by a sum, multiply the number by each addend and add the products.

**Q** Use the Distributive Property to find the product.

8.  $8 \times 15 = 8 \times (\square + \square)$   
 $= (\square \times \square) + (\square \times \square)$   
 $= \square + \square$   
 $= \square$

9.  $6 \times 17 = 6 \times (\square + \square)$   
 $= (\square \times \square) + (\square \times \square)$   
 $= \square + \square$   
 $= \square$

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## EXPLORE ACTIVITY 1



COMMON CORE 6.NS.4

## Understanding Common Factors

The **greatest common factor (GCF)** of two numbers is the greatest factor shared by those numbers.



**Q** A florist makes bouquets from 18 roses and 30 tulips. All the bouquets will include both roses and tulips. If all the bouquets are identical, what are the possible bouquets that can be made?

- A** Complete the tables to show the possible ways to divide each type of flower among the bouquets.

### Roses

Number of Bouquets	1	2	3	6	9	18
Number of Roses in Each Bouquet	18	9				

### Tulips

Number of Bouquets	1	2	3	5	6	10	15	30
Number of Tulips in Each Bouquet	30							

- B** Can the florist make five bouquets using all the flowers? Explain.

- C** What are the common factors of 18 and 30? What do they represent?

- D** What is the GCF of 18 and 30? \_\_\_\_\_

## Reflect

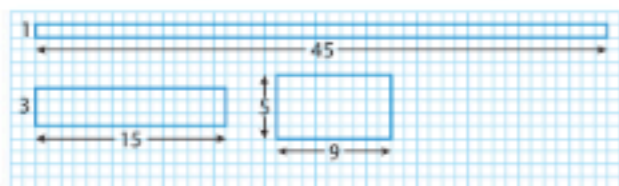
1. **What If?** Suppose the florist has 18 roses and 36 tulips. What is the GCF of the numbers of roses and tulips? Explain.

**EXPLORE ACTIVITY 2**

COMMON CORE 6.NS.4

**Using the Distributive Property**

You can use the Distributive Property to rewrite a sum of two or more numbers as a product of their GCF and a sum of numbers with no common factor. To understand how, you can use grid paper to draw area models of 45 and 60. Here are all the possible area models of 45.



- A** What do the side lengths of the area models (1, 3, 5, 9, 15, and 45) represent? \_\_\_\_\_
- B** On your own grid paper, show all of the possible area models of 60. \_\_\_\_\_
- C** What side lengths do the area models of 45 and 60 have in common? What do the side lengths represent? \_\_\_\_\_
- D** What is the greatest common side length? What does it represent? \_\_\_\_\_
- E** Write 45 as a product of the GCF and another number. \_\_\_\_\_  
Write 60 as a product of the GCF and another number. \_\_\_\_\_
- F** Use your answers above to rewrite  $45 + 60$ .  
 $45 + 60 = 15 \times \underline{\hspace{1cm}} + 15 \times \underline{\hspace{1cm}}$   
Use the Distributive Property and your answer above to write  $45 + 60$  as a product of the GCF and a sum of two numbers.  
 $15 \times \underline{\hspace{1cm}} + 15 \times \underline{\hspace{1cm}} = 15 \times (\underline{\hspace{1cm}} + \underline{\hspace{1cm}}) = 15 \times \underline{\hspace{1cm}}$

**Math Talk**  
Mathematical Practices  
How can you check to see if your product is correct?

**Reflect**

Write the sum of the numbers as the product of their GCF and another sum.

6.  $27 + 18$  \_\_\_\_\_      7.  $120 + 36$  \_\_\_\_\_
8.  $9 + 35$  \_\_\_\_\_

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**2.1 Independent Practice**

COMMON CORE 6.NS.4



**Q** List the factors of each number.

5. 12 \_\_\_\_\_      6. 50 \_\_\_\_\_
7. 39 \_\_\_\_\_      8. 64 \_\_\_\_\_

**Q** Find the GCF of each pair of numbers.

9. 40 and 48 \_\_\_\_\_      10. 30 and 45 \_\_\_\_\_
11. 10 and 45 \_\_\_\_\_      12. 25 and 90 \_\_\_\_\_
13. 21 and 40 \_\_\_\_\_      14. 28 and 70 \_\_\_\_\_

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**2.2 Independent Practice**

COMMON CORE 6.NS.4



**Q** Find the LCM of each pair of numbers.

3. 8 and 56 \_\_\_\_\_      4. 25 and 50 \_\_\_\_\_
5. 12 and 30 \_\_\_\_\_      6. 6 and 10 \_\_\_\_\_
7. 16 and 24 \_\_\_\_\_      8. 14 and 21 \_\_\_\_\_
9. 9 and 15 \_\_\_\_\_      10. 5 and 11 \_\_\_\_\_

**Q** 11. During February, Kevin will water his ivy every third day, and water his cactus every fifth day.

- a. On which date will Kevin first water both plants together?

\_\_\_\_\_

- b. Will Kevin water both plants together again in February? Explain.

\_\_\_\_\_

\_\_\_\_\_

**Q** 12. **Vocabulary** Given any two numbers, which is greater, the LCM of the numbers or the GCF of the numbers? Why?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Ready to Go On?



## Q 2.1 Greatest Common Factor

Find the GCF of each pair of numbers.

1. 20 and 32 \_\_\_\_\_
2. 24 and 56 \_\_\_\_\_
3. 36 and 90 \_\_\_\_\_
4. 45 and 75 \_\_\_\_\_
5. 28 girls and 32 boys volunteer to plant trees at a school. The principal divides the girls and boys into identical groups that have girls and boys in each group. What is the greatest number of groups the principal can make? \_\_\_\_\_

## Q Write the sum of the numbers as the product of their GCF and another sum.

6.  $32 + 20$  \_\_\_\_\_
7.  $18 + 27$  \_\_\_\_\_

## Q 2.2 Least Common Multiple

Find the LCM of each pair of numbers.

8. 6 and 12 \_\_\_\_\_
9. 6 and 10 \_\_\_\_\_
10. 8 and 9 \_\_\_\_\_
11. 9 and 12 \_\_\_\_\_

- Q 12. Juanita runs every third day and swims every fifth day. If Juanita runs and swims today, in how many days will she run and swim again on the same day? \_\_\_\_\_

## ? ESSENTIAL QUESTION

- Q 13. What types of problems can be solved using the greatest common factor? What types of problems can be solved using the least common multiple?

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## Assessment Readiness



## Selected Response

- Q 1. What is the least common multiple of 5 and 150?
- (A) 5 (B) 50 (C) 15 (D) 150
2. Cy has 42 baseball cards and 70 football cards that he wants to group into packages. Each package will have the same number of cards, and each package will have the same numbers of baseball cards and football cards. How many packages will Cy make if he uses all of the cards?
- (A) 7 (B) 10 (C) 14 (D) 21
3. During a promotional event, a sporting goods store gave a free T-shirt to every 8th customer and a free water bottle to every 10th customer. Which customer was the first to get a free T-shirt and a free water bottle?
- (A) the 10th customer (B) the 20th customer (C) the 40th customer (D) the 80th customer
4. The table below shows the positions relative to sea level of four divers.

Kareem	Li	Maria	Tara
-8 ft	-10 ft	-9 ft	-7 ft

Which diver is farthest from the surface?

- (A) Kareem (B) Li (C) Maria (D) Tara

5. What is the greatest common factor of 12 and 16?
- (A) 2 (B) 4 (C) 12 (D) 48
6. Which expression is equivalent to  $27 + 15$ ?
- (A)  $9 \times (3 + 5)$  (B)  $3 \times (9 + 15)$  (C)  $9 \times (3 + 15)$  (D)  $3 \times (9 + 5)$
7. During a science experiment, the temperature of a solution in Beaker 1 was 5 degrees below zero. The temperature of a solution in Beaker 2 was the opposite of the temperature in Beaker 1. What was the temperature in Beaker 2?
- (A) -5 degrees (B) 0 degrees (C) 5 degrees (D) 10 degrees

## Mini-Task

- Q 8. Tia is buying paper cups and plates. Cups come in packages of 12, and plates come in packages of 10. She wants to buy the same number of cups and plates, but plans to buy the least number of packages possible. How much should Tia expect to pay if each package of cups is \$3 and each package of plates is \$5? Explain.

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# Are YOU Ready?

Complete these exercises to review skills you will need for this module.



## Write an Improper Fraction as a Mixed Number

**EXAMPLE**

$$\begin{aligned}\frac{11}{3} &= \frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{2}{3} \\ &= 1 + 1 + 1 + \frac{2}{3} \\ &= 3 + \frac{2}{3} \\ &= 3\frac{2}{3}\end{aligned}$$

Write as a sum using names for one plus a proper fraction.

Write each name for one as one.

Add the ones.

Write the mixed number.

**Q** Write each improper fraction as a mixed number.

1.  $\frac{7}{2}$  \_\_\_\_\_ 2.  $\frac{12}{5}$  \_\_\_\_\_ 3.  $\frac{11}{7}$  \_\_\_\_\_ 4.  $\frac{15}{4}$  \_\_\_\_\_

## Write a Mixed Number as an Improper Fraction

**EXAMPLE**

$$\begin{aligned}3\frac{3}{4} &= 1 + 1 + 1 + \frac{3}{4} \\ &= \frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{3}{4} \\ &= \frac{15}{4}\end{aligned}$$

Write the whole number as a sum of ones.

Use the denominator of the fraction to write equivalent fractions for the ones.

Add the numerators.

**Q** Write each mixed number as an improper fraction.

5.  $2\frac{1}{2}$  \_\_\_\_\_ 6.  $4\frac{3}{5}$  \_\_\_\_\_ 7.  $3\frac{4}{9}$  \_\_\_\_\_ 8.  $2\frac{5}{7}$  \_\_\_\_\_

## Compare and Order Decimals

**EXAMPLE** Order from least to greatest: 7.32, 5.14, 5.16.

7.32 is greatest.

5.14 < 5.16

The order is 5.14, 5.16, 7.32.

Use place value to compare numbers, starting with ones, then tenths, then hundredths.

**Q** Compare the decimals.

9. 8.86 \_\_\_\_\_ 8.65 10. 0.732 \_\_\_\_\_ 0.75 11. 0.22 \_\_\_\_\_ 0.022

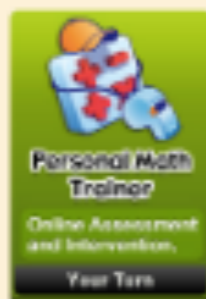
12. Order 0.98, 0.27, and 0.34 from greatest to least. \_\_\_\_\_



### Math Talk

#### Mathematical Practices

What division is represented by the fraction  $\frac{3}{5}$ ?



## 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  $\frac{a}{b}$ .

**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 \_\_\_\_\_

## Classifying Rational Numbers

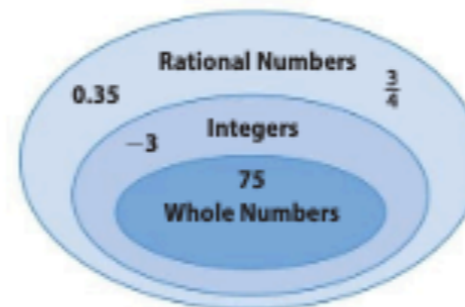
A **Venn diagram** is a visual representation used to show the relationships between groups. The Venn diagram below shows how rational numbers, integers, and whole numbers are related.



### 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.



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### 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



## 3.1 Independent Practice

6.NS.6

**Q** List two numbers that fit each description. Then write the numbers in the appropriate location on the Venn diagram.

8. Integers that are not whole numbers

\_\_\_\_\_

9. Rational numbers that are not integers

\_\_\_\_\_

**Q** 10. **Multistep** A nature club is having its weekly hike. The table shows how many pieces of fruit and bottles of water each member of the club brought to share.

Member	Pieces of Fruit	Bottles of Water
Baxter	3	5
Hendrick	2	2
Mary	4	3
Kendra	5	7

a. If the hikers want to share the fruit evenly, how many pieces should each person receive?

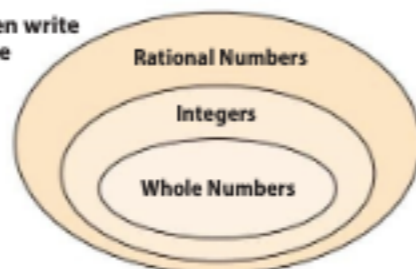
\_\_\_\_\_

b. Which hikers received more fruit than they brought on the hike?

\_\_\_\_\_

c. The hikers want to share their water evenly so that each member has the same amount. How much water does each hiker receive?

\_\_\_\_\_



### YOUR TURN

**Q** 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 \_\_\_\_\_



## EXPLORE ACTIVITY



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

# Positive and Negative Rational Numbers

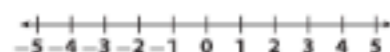
Recall that positive numbers are greater than 0. They are located to the right of 0 on a number line. Negative numbers are less than 0. They are located to the left of 0 on a number line.



**Q** 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

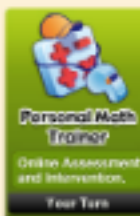


- B** How did you know where to graph  $-0.5$ ? \_\_\_\_\_
- C** At what time or times is the level closest to sea level? How do you know?  
\_\_\_\_\_
- D** Which point is located halfway between  $-3$  and  $-2$ ? \_\_\_\_\_
- E** Which point is the same distance from 0 as D? \_\_\_\_\_

## Reflect

- Communicate Mathematical Ideas** How would you graph  $-2.25$ ? Would it be left or right of point D?  
\_\_\_\_\_

Lesson 3.2 53



## YOUR TURN

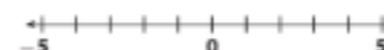
- Q** 2. What are the opposites of 7,  $-3.5$ ,  $2.25$ , and  $9\frac{1}{3}$ ?  
\_\_\_\_\_

## Mathematical Practices

How do you know where to graph  $-5.4$ ?

## YOUR TURN

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



- 4.  $-4.5; |-4.5| =$  \_\_\_\_\_
- 5.  $1\frac{1}{2}; |1\frac{1}{2}| =$  \_\_\_\_\_
- 6.  $4; |4| =$  \_\_\_\_\_
- 7.  $-3\frac{1}{4}; |-3\frac{1}{4}| =$  \_\_\_\_\_

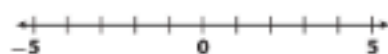


Lesson 3.2 55

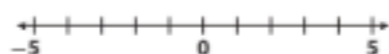
## Guided Practice

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

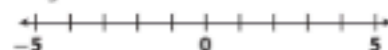
1.  $-2.8$



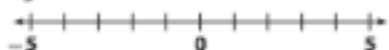
2.  $4.3$



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



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



**Q** 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)

\_\_\_\_\_

\_\_\_\_\_

**Q** 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

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## EXPLORE ACTIVITY 1

LEARN CODE 6.NS.6, 6.NS.6c, 6.NS.7a

## Equivalent Fractions

You can order fractions by rewriting the fractions with a common denominator, then plotting them on a number line.

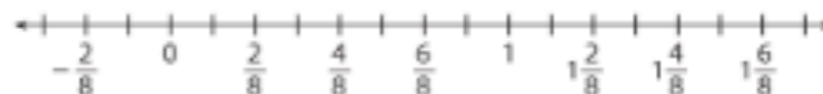
**Q** Four students are running a race and trying to reach a goal time. The table shows the students' times in relation to the goal time. Order the time differences from least to greatest.

Student	A	B	C	D
Time Difference	$\frac{10}{16}$	$-\frac{1}{4}$	$\frac{3}{2}$	$\frac{3}{8}$

**A** Write the fractions as equivalent fractions with a common denominator of 8.

$$\frac{10}{16} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \quad -\frac{1}{4} = -\frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \quad \frac{3}{2} = \frac{12}{8} = \boxed{\phantom{00}} \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} \quad \frac{3}{8} = \frac{3}{8}$$

**B** Plot the fractions on the number line.



**C** Use the relative positions of the points on the number line to write the fractions in order from least to greatest.

Since \_\_\_\_\_ is the fraction furthest to the left, it has the least value. Reading left to right, \_\_\_\_\_ is the next fraction, then \_\_\_\_\_, then \_\_\_\_\_.

\_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_

**D** When writing the fractions in order, be sure to use the original forms of the fractions given at the beginning of the problem. The time differences from

least to greatest are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

**Q** **Reflect**

1. **Justify Reasoning** Is 8 the only common denominator that could have been used?

\_\_\_\_\_

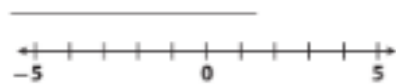
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## Practice

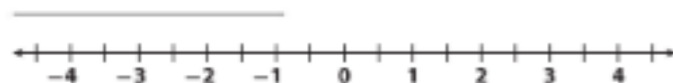


Order the numbers from least to greatest using the number line.

1.  $-\frac{9}{2}$ ,  $1\frac{5}{10}$ , 4, and  $-3\frac{1}{4}$



2. -2.5, 1.25, 4, and -3.25



3. Order  $\frac{1}{4}$ ,  $1\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{16}$  from least to greatest using a number line.

\_\_\_\_\_

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## EXPLORE ACTIVITY

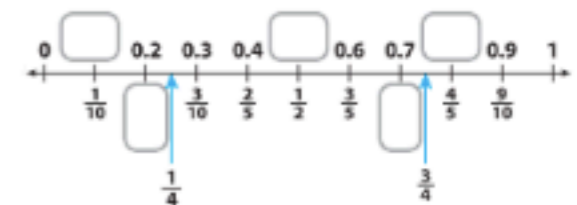
COMMON CORE Prep for 6.NS.7a

### 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  $1\frac{2}{10}$ .

\_\_\_\_\_

- D Use the number line to complete each statement.

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

### 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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## Guided Practice

**Q** 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.  $1.4 =$  \_\_\_\_\_

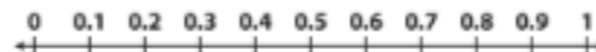
7.  $\frac{4}{5} =$  \_\_\_\_\_

8.  $0.4 =$  \_\_\_\_\_

9.  $\frac{6}{8} =$  \_\_\_\_\_

**Q** 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	$12\frac{3}{5}$	$12\frac{3}{4}$

**Q** 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**

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

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# 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.

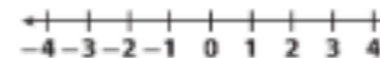
2.  $5\frac{1}{6}$  \_\_\_\_\_ 3.  $-12$  \_\_\_\_\_

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?  
 \_\_\_\_\_  
 \_\_\_\_\_

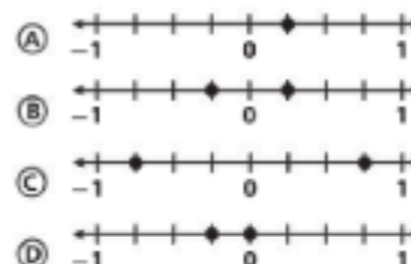
**Q Selected Response**

- Suki split five dog treats equally among her six dogs. Which fraction represents this division?  
 (A)  $\frac{6}{5}$  of a treat      (C)  $\frac{1}{5}$  of a treat  
 (B)  $\frac{5}{6}$  of a treat      (D)  $\frac{1}{6}$  of a treat
- Which set or sets does the number 15 belong to?  
 (A) whole numbers only  
 (B) rational numbers only  
 (C) integers and rational numbers only  
 (D) whole numbers, integers, and rational numbers
- Which of the following statements about rational numbers is correct?  
 (A) All rational numbers are also whole numbers.  
 (B) All rational numbers are also integers.  
 (C) All rational numbers can be written in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers and  $b \neq 0$ .  
 (D) Rational numbers cannot be negative.
- Which of the following shows the numbers in order from least to greatest?  
 (A)  $-\frac{1}{5}, -\frac{2}{3}, 2, 0.4$   
 (B)  $2, -\frac{2}{3}, 0.4, -\frac{1}{5}$   
 (C)  $-\frac{2}{3}, 0.4, -\frac{1}{5}, 2$   
 (D)  $-\frac{2}{3}, -\frac{1}{5}, 0.4, 2$

- What is the absolute value of  $-12.5$ ?

(A) 12.5      (C)  $-1$   
 (B) 1      (D)  $-12.5$

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



- 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?

(A)  $-10$       (C) 0  
 (B) 10      (D)  $\frac{1}{10}$

**Mini-Task**

- 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

- Write each height in the form  $\frac{a}{b}$ .  
 \_\_\_\_\_
- List the heights in order from greatest to least.  
 \_\_\_\_\_

## MODULE 1 Integers



## ESSENTIAL QUESTION

How can you use integers to solve real-world problems?

## EXAMPLE 1

James recorded the temperature at noon in Fairbanks, Alaska, over a week in January.

Day	Mon	Tues	Wed	Thurs	Fri
Temperature	3	2	7	-3	-1

Graph the temperatures on the number line, and then list the numbers in order from least to greatest.

Graph the temperatures on the number line.



Read from left to right to list the temperatures in order from least to greatest.

The temperatures listed from least to greatest are -3, -1, 2, 3, 7.

## EXAMPLE 2

Graph -4, 0, 2, and -1 on the number line. Then use the number line to find each absolute value.



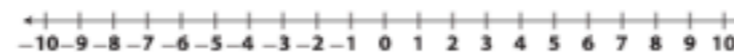
A number and its opposite are the same distance from 0 on the number line. The absolute value of a negative number is its opposite.

$$|-4| = 4 \quad |0| = 0 \quad |2| = 2 \quad |-1| = 1$$

## EXERCISES



1. Graph 7, -2, 5, 1, and -1 on the number line. (Lesson 1.1)



2. List the numbers from least to greatest. (Lesson 1.2)

2. 4, 0, -2, 3 \_\_\_\_\_

3. -3, -5, 2, -2 \_\_\_\_\_



- Compare using < or >. (Lesson 1.2)

4. 4 ○ 1

5. -2 ○ 2

6. -3 ○ -5

7. -7 ○ 2



- Find the opposite and absolute value of each number. (Lessons 1.1, 1.3)

8. 6 \_\_\_\_\_

9. -2 \_\_\_\_\_

## Key Vocabulary

absolute value (*valor absoluto*)

inequality (*desigualdad*)

integers (*enteros*)

negative numbers (*números negativos*)

opposites (*opuestos*)

positive numbers (*números positivos*)

## MODULE 2 Factors and Multiples



### ESSENTIAL QUESTION

How do you find and use the greatest common factor of two whole numbers? How do you find and use the least common multiple of two numbers?

### Key Vocabulary

greatest common factor  
(GCF) (*máximo común divisor* (MCD))  
least common multiple  
(LCM) (*mínimo común múltiplo* (mcm))

### EXAMPLE 1

Use the Distributive Property to rewrite  $32 + 24$  as a product of their greatest common factor and another number.

- A. List the factors of 24 and 32. Circle the common factors.

24: ① ② 3 ④ 6 ⑧ 12 24

32: ① ② ④ ⑧ 16 32

- B. Rewrite each number as a product of the GCF and another number.

24:  $8 \times 3$       32:  $8 \times 4$

- C. Use the Distributive Property and your answer above to rewrite  $32 + 24$  using the GCF and another number.

$$32 + 24 = 8 \times 3 + 8 \times 4$$

$$32 + 24 = 8 \times (3 + 4)$$

$$32 + 24 = 8 \times 7$$

### EXAMPLE 2

On Saturday, every 8th customer at Adam's Bagels will get a free coffee. Every 12th customer will get a free bagel. Which customer will be the first to get a free coffee and a free bagel?

- A. List the first several multiples of 8 and 12. Circle the common multiples.

8: 8 16 ②4 32 40 ④8

12: 12 ②4 36 ④8

- B. Find the LCM of 8 and 12.

The LCM is 24. The 24th customer will be the first to get a free coffee and a free bagel.

### EXERCISES



1. Find the GCF of 49 and 63 (Lesson 2.1) \_\_\_\_\_



Rewrite each sum as a product of the GCF of the addends and another number. (Lesson 2.1)

2.  $15 + 45 =$  \_\_\_\_\_      3.  $9 + 27 =$  \_\_\_\_\_

4. Find the LCM of 9 and 6 (Lesson 2.2) \_\_\_\_\_

## MODULE 3 Rational Numbers



### ESSENTIAL QUESTION

How can you use rational numbers to solve real-world problems?

### Key Vocabulary

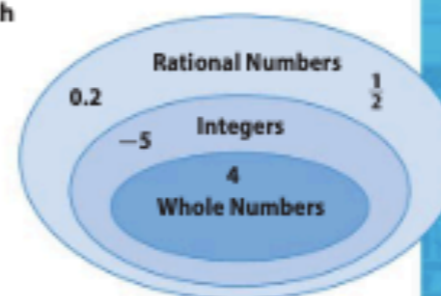
rational number (*número racional*)

Venn diagram (*diagrama de Venn*)

### EXAMPLE 1

Use the Venn diagram to determine in which set or sets each number belongs.

- $\frac{1}{2}$  belongs in the set of rational numbers.
- $-5$  belongs in the sets of integers and rational numbers.
- $4$  belongs in the sets of whole numbers, integers, and rational numbers.
- $0.2$  belongs in the set of rational numbers.



### EXAMPLE 2

Order  $\frac{2}{5}$ ,  $0.2$ , and  $\frac{4}{15}$  from greatest to least.

Write the decimal as an equivalent fraction.  $0.2 = \frac{2}{10} = \frac{1}{5}$

Find equivalent fractions with 15 as the common denominator.  $\frac{2 \times 3}{5 \times 3} = \frac{6}{15}$   $\frac{1 \times 3}{5 \times 3} = \frac{3}{15}$   $\frac{4}{15} = \frac{4}{15}$

Order fractions with common denominators by comparing the numerators.  $6 > 4 > 3$   $\frac{6}{15} > \frac{4}{15} > \frac{3}{15}$

The numbers in order from greatest to least are,  $\frac{2}{5}$ ,  $\frac{4}{15}$ , and  $0.2$ .

### EXERCISES



Classify each number by indicating in which set or sets it belongs. (Lesson 2.1)

- $8$  \_\_\_\_\_
- $0.25$  \_\_\_\_\_



Find the absolute value of each rational number. (Lesson 2.2)

- $|3.7|$  \_\_\_\_\_
- $|- \frac{2}{3}|$  \_\_\_\_\_



Graph each set of numbers on the number line and order the numbers from greatest to least. (Lessons 2.1, 2.3)

- $-0.5, -1, -\frac{1}{4}, 0$

\_\_\_\_\_

**Selected Response**

1. What is the opposite of
- $-9$
- ?

(A) 9  
(B)  $-\frac{1}{9}$   
(C) 0  
(D)  $\frac{1}{9}$

2. Kyle is currently 60 feet above sea level. Which correctly describes the opposite of Kyle's elevation?

(A) 60 feet below sea level  
(B) 60 feet above sea level  
(C) 6 feet below sea level  
(D) At sea level

3. What is the absolute value of 27?

(A)  $-27$   
(B) 0  
(C) 3  
(D) 27

4. In Albany it is
- $-4^{\circ}\text{F}$
- , in Chicago it is
- $-14^{\circ}\text{F}$
- , in Minneapolis it is
- $-11^{\circ}\text{F}$
- , and in Toronto it is
- $-13^{\circ}\text{F}$
- . In which city is it the coldest?

(A) Albany  
(B) Chicago  
(C) Minneapolis  
(D) Toronto

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

(A) 18, 4, 3,  $-2$ ,  $-15$   
(B)  $-2$ , 3, 4,  $-15$ , 18  
(C)  $-15$ ,  $-2$ , 3, 4, 18  
(D) 18,  $-15$ , 4, 3,  $-2$

6. Joanna split three pitchers of water equally among her eight plants. What fraction of a pitcher did each plant get?

(A)  $\frac{1}{8}$  of a pitcher  
(B)  $\frac{1}{3}$  of a pitcher  
(C)  $\frac{3}{8}$  of a pitcher  
(D)  $\frac{8}{3}$  of a pitcher

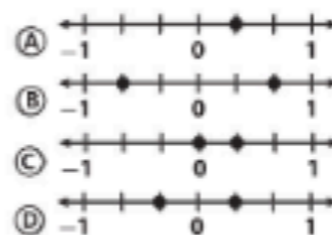
7. Which set or sets does the number
- $-22$
- belong to?

(A) Whole numbers only  
(B) Rational numbers only  
(C) Integers and rational numbers only  
(D) Whole numbers, integers, and rational numbers

8. Carlos swam to the bottom of a pool that is 12 feet deep. What is the opposite of Carlos's elevation relative to the surface?

(A)  $-12$  feet      (C) 12 feet  
(B) 0 feet      (D)  $\frac{1}{12}$  foot

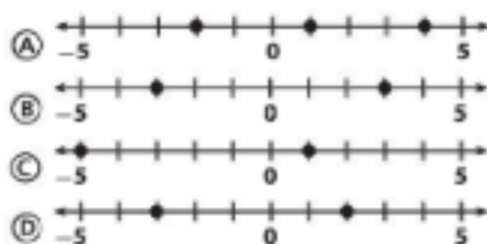
9. Which number line shows
- $\frac{1}{3}$
- and its opposite?



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

(A)  $-\frac{2}{3}$ ,  $-\frac{3}{4}$ , 0.7, 0  
(B) 0.7, 0,  $-\frac{2}{3}$ ,  $-\frac{3}{4}$   
(C)  $-\frac{2}{3}$ ,  $-\frac{3}{4}$ , 0, 0.7  
(D)  $-\frac{3}{4}$ ,  $-\frac{2}{3}$ , 0, 0.7

- Q** 11. Which number line shows an integer and its opposite?



12. Which is another way to write  $42 + 63$ ?

- (A)  $7 \times (6 + 7)$  (C)  $7 \times 6 \times 9$   
(B)  $7 \times 15$  (D)  $7 + 6 + 9$

13. What is the LCM of 9 and 15?

- (A) 30 (C) 90  
(B) 45 (D) 135

14. What is the GCF of 40 and 72?

- (A) 2 (C) 8  
(B) 4 (D) 12

**Q Mini-Task**

15. Stella is recording temperatures every day for 5 days. On the first day, Stella recorded a temperature of  $0^\circ\text{F}$ .

- a. On the second day, the temperature was  $3^\circ\text{F}$  above the temperature on the first day. What was the temperature on the second day? \_\_\_\_\_
- b. On the third day, it was  $4^\circ\text{F}$  below the temperature of the first day. What was the temperature? \_\_\_\_\_
- c. The temperature on the fourth day was the opposite of the temperature on the second day. What was the temperature? \_\_\_\_\_

- d. The temperature on the fifth day was the absolute value of the temperature on the fourth day. What was the temperature? \_\_\_\_\_
- e. Write the temperatures in order from least to greatest. \_\_\_\_\_
- f. What is the difference in temperature between the coldest day and the warmest day? \_\_\_\_\_

- Q** 16. Marco is making mosaic garden stones using red, yellow, and blue tiles. He has 45 red tiles, 90 blue tiles, and 75 yellow tiles. Each stone must have the same number of each color tile. What is the greatest number

of stones Marco can make? \_\_\_\_\_

- a. How many of each color tile will Marco use in each stone?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- b. How can Marco use the GCF to find out how many tiles he has in all?