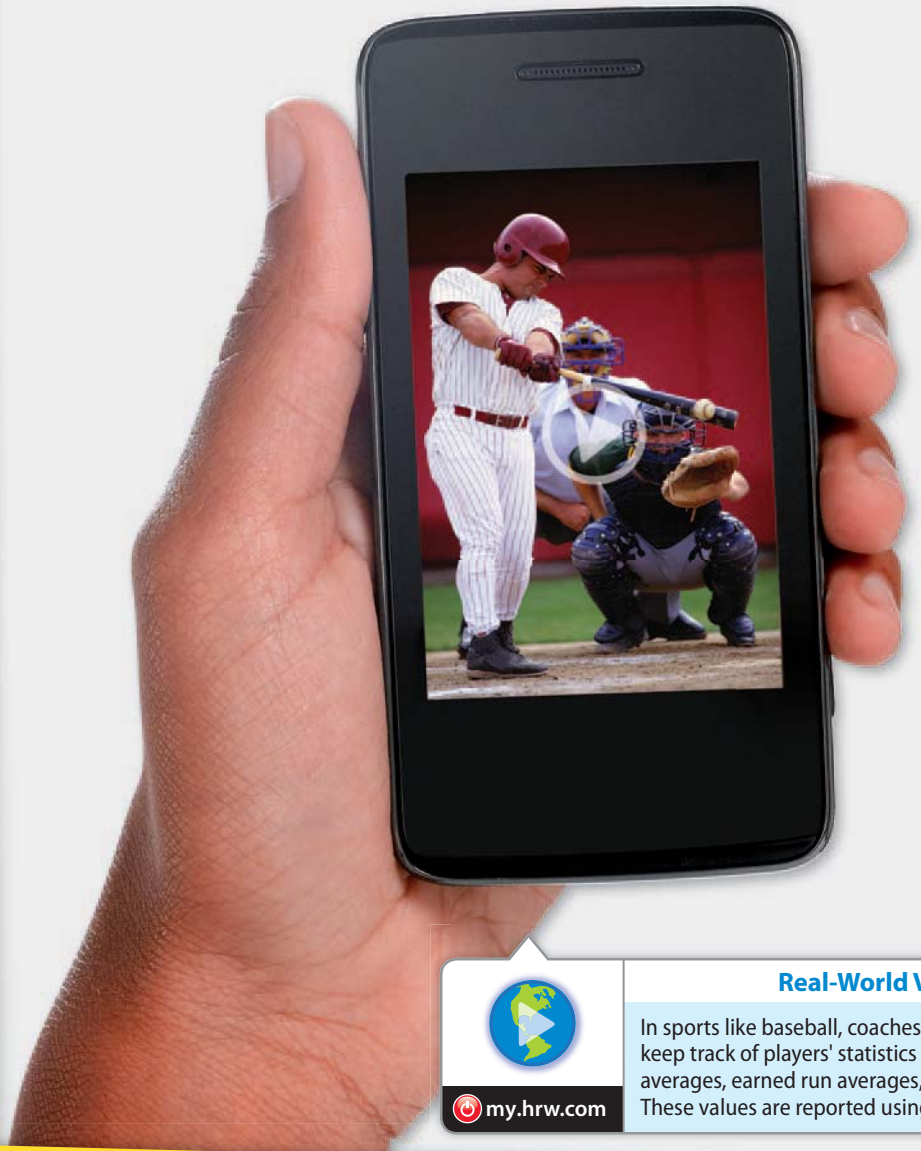
Rational Numbers

MODULE 3

COMMON CORE

ESSENTIAL QUESTION

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



LESSON 3.1

Classifying Rational Numbers

COMMON CORE 6.NS.6

LESSON 3.2

Identifying Opposites and Absolute Value of Rational Numbers

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

LESSON 3.3

Comparing and Ordering Rational Numbers

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

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Real-World Video

In sports like baseball, coaches, analysts, and fans keep track of players' statistics such as batting averages, earned run averages, and runs batted in. These values are reported using rational numbers.

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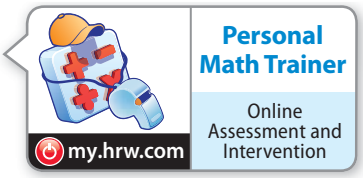
Are YOU Ready?

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



Write an Improper Fraction as a Mixed Number

EXAMPLE

$\frac{11}{3} = \frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{2}{3}$ — Write as a sum using names for one plus a proper fraction.

$= 1 + 1 + 1 + \frac{2}{3}$ — Write each name for one as one.

$= 3 + \frac{2}{3}$ — Add the ones.

$= 3\frac{2}{3}$ — Write the mixed number.

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

$3\frac{3}{4} = 1 + 1 + 1 + \frac{3}{4}$ — Write the whole number as a sum of ones.

$= \frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{3}{4}$ — Use the denominator of the fraction to write equivalent fractions for the ones.

$= \frac{15}{4}$ — Add the numerators.

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.

$5.14 < 5.16$ — Use place value to compare numbers, starting with ones, then tenths, then hundredths.

The order is 5.14, 5.16, 7.32.

Compare the decimals.

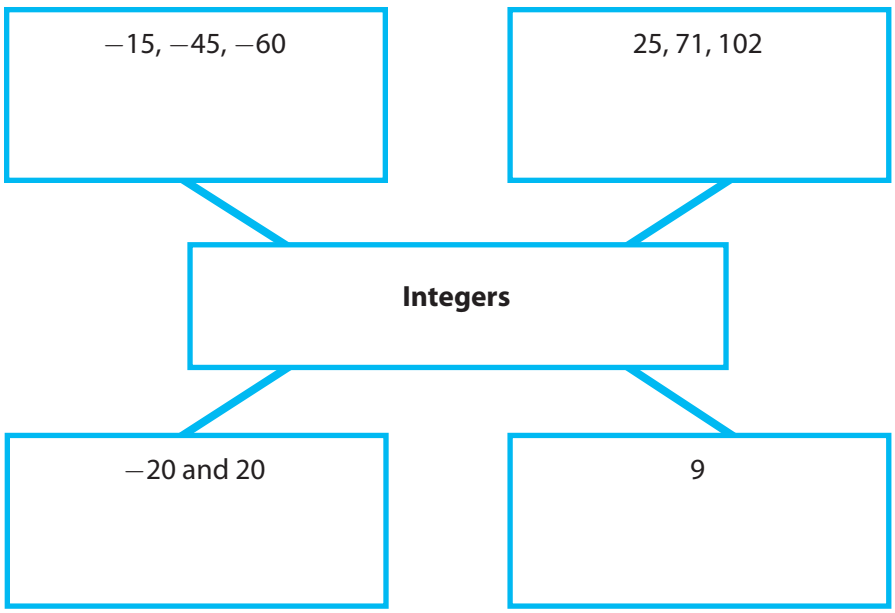
9. 8.86 _____ 8.65 **10.** 0.732 _____ 0.75 **11.** 0.22 _____ 0.022

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

Reading Start-Up

Visualize Vocabulary

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



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)*

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.

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.

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

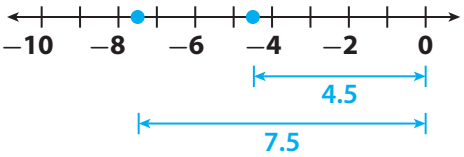
absolute value *(valor absoluto)*
A number's distance from 0 on the number line.

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.

Visit **my.hrw.com** to see all the **Common Core Standards** unpacked.

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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?

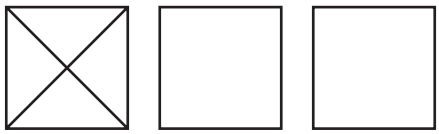
EXPLORE ACTIVITY Real World

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.



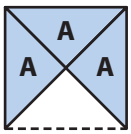
_____

_____

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.



Alicia Brittany Kenji Ellis

_____

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?

_____

_____

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 $\frac{a}{b}$.

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.* $-7 = \frac{-7}{1}$

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

YOUR TURN

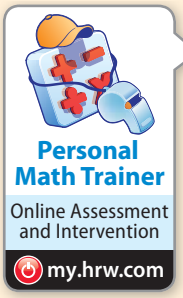
Write each rational number as $\frac{a}{b}$.

3. -15 _____

4. 0.31 _____

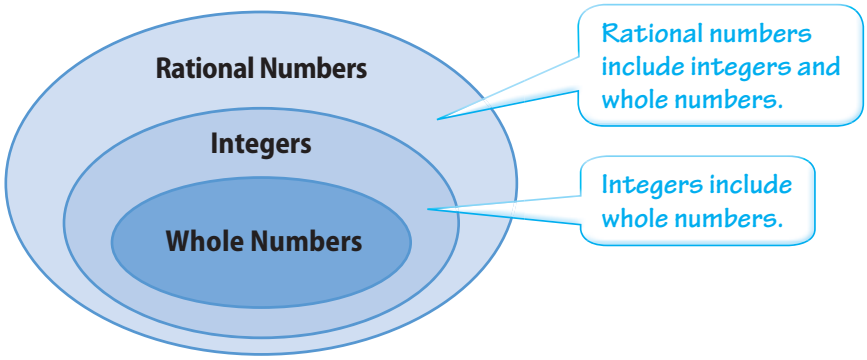
5. $4\frac{5}{9}$ _____

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.



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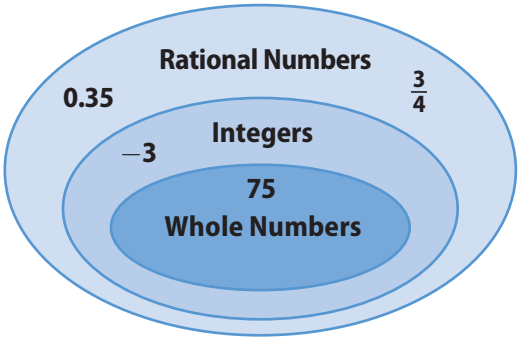
EXAMPLE 2

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.

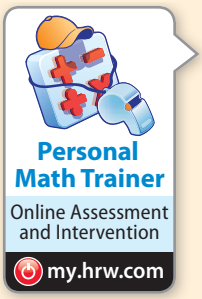
_____

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

_____

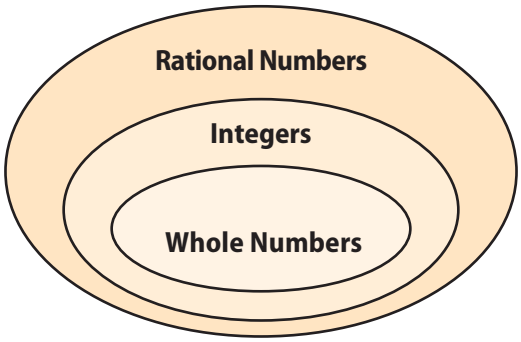
_____

My Notes



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? _____

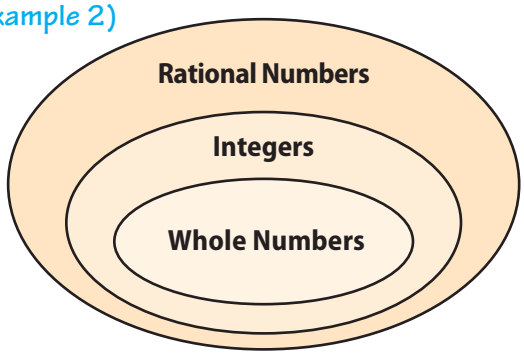
Write each rational number in the form $\frac{a}{b}$, where a and b are integers. (Example 1)

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?

_____

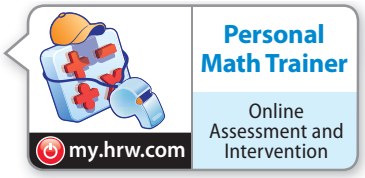
_____

_____

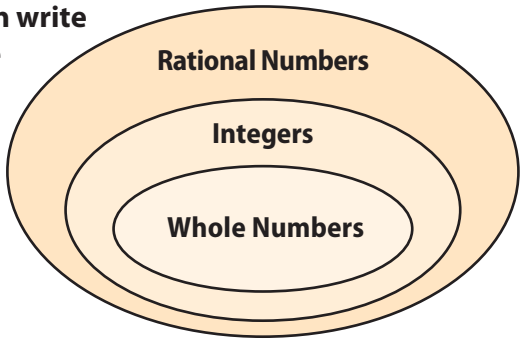
Name _____ Class _____ Date _____

3.1 Independent Practice

COMMON CORE 6.NS.6



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

_____

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?

_____

11. Sherman has 3 cats and 2 dogs. He wants to buy a toy for each of his pets. Sherman has $22 to spend on pet toys. How much can he spend on each pet? Write your answer as a fraction and as an amount in dollars and cents.

_____

12. A group of 5 friends are sharing 2 pounds of trail mix. Write a division problem and a fraction to represent this situation.

_____

13. **Vocabulary** A _____ diagram can represent set relationships visually.

Financial Literacy **For 14–16, use the table. The table shows Jason's utility bills for one month. Write a fraction to represent the division in each situation. Then classify each result by indicating the set or sets to which it belongs.**

March Bills	
Water	$35
Gas	$14
Electric	$108

14. Jason and his 3 roommates share the cost of the electric bill evenly.

15. Jason plans to pay the water bill with 2 equal payments.

16. Jason owes $15 for last month's gas bill also. The total amount of the two gas bills is split evenly among the 4 roommates.

17. Lynn has a watering can that holds 16 cups of water, and she fills it half full. Then she waters her 15 plants so that each plant gets the same amount of water. How many cups of water will each plant get?

H.O.T. FOCUS ON HIGHER ORDER THINKING

Work Area

18. **Critique Reasoning** DaMarcus says the number $\frac{24}{6}$ belongs only to the set of rational numbers. Explain his error.

19. **Analyze Relationships** Explain how the Venn diagrams in this lesson show that all integers and all whole numbers are rational numbers.

20. **Critical Thinking** Is it possible for a number to be a rational number that is not an integer but is a whole number? Explain.

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

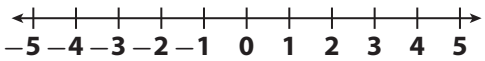
Positive and Negative Rational Numbers

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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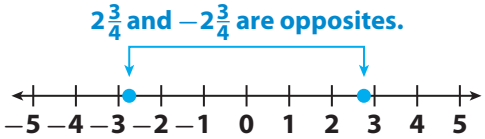
Rational Numbers and Opposites on a Number Line

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 ($)	$1\frac{5}{8}$	$-4\frac{1}{4}$

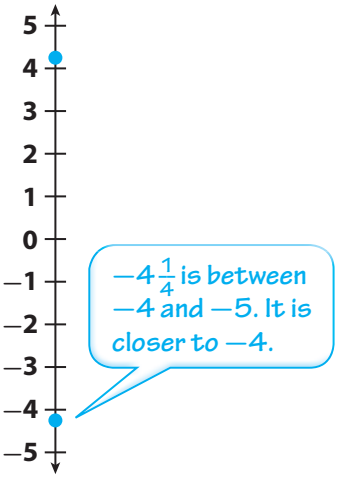
STEP 1 Graph the change in stock value for Wednesday on the number line.

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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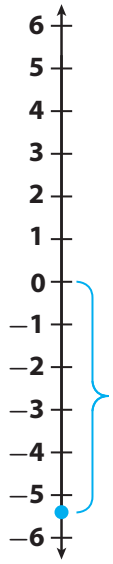
EXAMPLE 2

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?

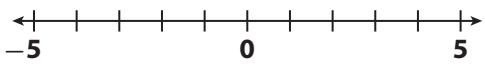
_____

_____

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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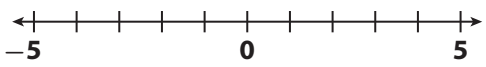
My Notes

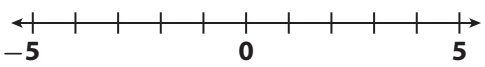
Guided Practice

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

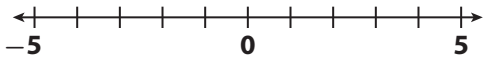
1. -2.8



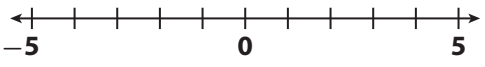
2. 4.3



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?

_____

_____

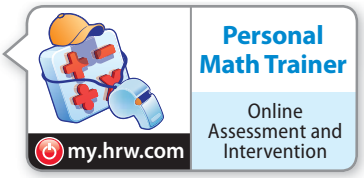
_____

_____

Name _____ Class _____ Date _____

3.2 Independent Practice

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



19. **Financial Literacy** A store's balance sheet represents the amounts customers owe as negative numbers and credits to customers as positive numbers.

Customer	Girardi	Lewis	Stein	Yuan	Wenner
Balance ($)	−85.23	20.44	−116.33	13.50	−9.85

a. Write the opposite of each customer's balance.

_____

_____

b. Mr. Yuan wants to use his credit to pay off the full amount that another customer owes. Which customer's balance does Mr. Yuan have enough money to pay off? _____

c. Which customer's balance would be farthest from 0 on a number line? Explain.

_____

_____

20. **Multistep** Trina and Jessie went on a vacation to Hawaii. Trina went scuba diving and reached an elevation of −85.6 meters, which is below sea level. Jessie went hang-gliding and reached an altitude of 87.9 meters, which is above sea level.

a. Who is closer to the surface of the ocean? Explain.

_____

b. Trina wants to hang-glide at the same number of meters above sea level as she scuba-dived below sea level. Will she fly higher than Jessie did? Explain.

_____

_____

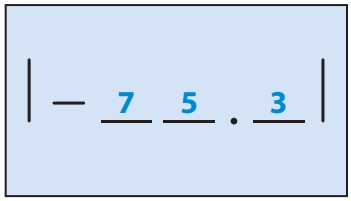
21. **Critical Thinking** Carlos finds the absolute value of −5.3, and then finds the opposite of his answer. Jason finds the opposite of −5.3, and then finds the absolute value of his answer. Whose final value is greater? Explain.

_____

_____

_____

22. **Explain the Error** Two students are playing a math game. The object of the game is to make the least possible number by arranging the given digits inside absolute value bars on a card. In the first round, each player will use the digits 3, 5, and 7 to fill in the card.



a. One student arranges the numbers on the card as shown. What was this student's mistake?

_____

_____

_____

b. What is the least possible number the card can show? _____

H.O.T. FOCUS ON HIGHER ORDER THINKING

23. **Analyze Relationships** If you plot the point −8.85 on a number line, would you place it to the left or right of −8.8? Explain.

_____

_____

24. **Make a Conjecture** If the absolute value of a negative number is 2.78, what is the distance on the number line between the number and its absolute value? Explain your answer.

_____

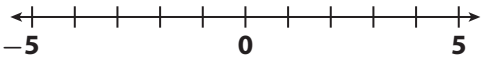
_____

25. **Multiple Representations** The deepest point in the Indian Ocean is the Java Trench, which is 25,344 feet below sea level. Elevations below sea level are represented by negative numbers.

a. Write the elevation of the Java Trench. _____

b. A mile is 5,280 feet. Between which two integers is the elevation in miles? _____

c. Graph the elevation of the Java Trench in miles.



26. **Draw Conclusions** A number and its absolute value are equal. If you subtract 2 from the number, the new number and its absolute value are not equal. What do you know about the number? What is a possible number that satisfies these conditions?

_____

_____

Work Area

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?

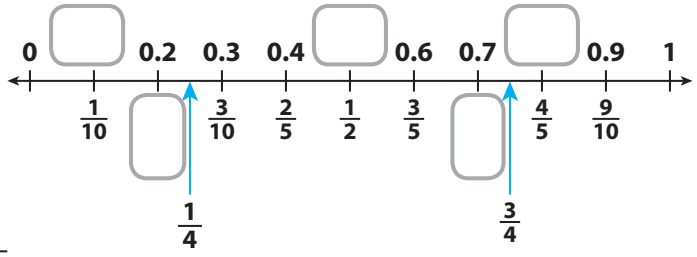
EXPLORE ACTIVITY COMMON CORE **Prep for 6.NS.7a**

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, $\frac{7}{10}$ _____

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.

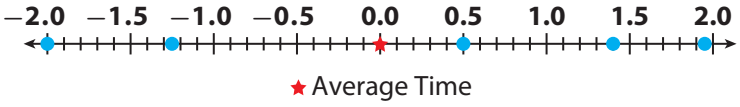
Runner	John	Sue	Anna	Mike	Tom
Time above or below average (minutes)	$\frac{1}{2}$	1.4	$-1\frac{1}{4}$	-2.0	1.95

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)

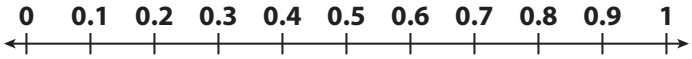
1. $0.6 =$ _____ **2.** $\frac{1}{4} =$ _____ **3.** $0.9 =$ _____

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 $\frac{5}{8}$.

_____

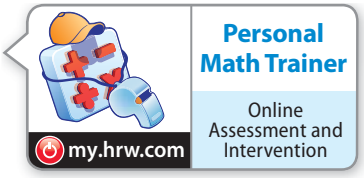
_____

_____

Name _____ Class _____ Date _____

3.3 Independent Practice

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



22. Rosa and Albert receive the same amount of allowance each week. The table shows what part of their allowance they each spent on video games and pizza.

	Video games	Pizza
Rosa	0.4	$\frac{2}{5}$
Albert	$\frac{1}{2}$	0.25

a. Who spent more of their allowance on video games? Write an inequality to compare the portion spent on video games.

_____

b. Who spent more of their allowance on pizza? Write an inequality to compare the portion spent on pizza.

_____

c. **Draw Conclusions** Who spent the greater part of their total allowance? How do you know?

_____

_____

23. A group of friends is collecting aluminum for a recycling drive. Each person who donates at least 4.25 pounds of aluminum receives a free movie coupon. The weight of each person's donation is shown in the table.

	Brenda	Claire	Jim	Micah	Peter
Weight (lb)	4.3	5.5	$6\frac{1}{6}$	$\frac{15}{4}$	$4\frac{3}{8}$

a. Order the weights of the donations from greatest to least.

_____

b. Which of the friends will receive a free movie coupon? Which will not?

_____

c. **What If?** Would the person with the smallest donation win a movie coupon if he or she had collected $\frac{1}{2}$ pound more of aluminum? Explain.

_____

_____

_____

24. Last week, several gas stations in a neighborhood all charged the same price for a gallon of gas. The table below shows how much gas prices have changed from last week to this week.

Gas Station	Gas and Go	Samson Gas	Star Gas	Corner Store	Tip Top Shop
Change from last week (in cents)	-6.6	5.8	$-6\frac{3}{4}$	$\frac{27}{5}$	$-5\frac{5}{8}$

a. Order the numbers in the table from least to greatest.

_____

b. Which gas station has the cheapest gas this week? _____

c. **Critical Thinking** Which gas station changed their price the least this week?

_____

H.O.T. FOCUS ON HIGHER ORDER THINKING

25. **Analyze Relationships** Explain how you would order from least to greatest three numbers that include a positive number, a negative number, and zero.

_____

_____

_____

26. **Critique Reasoning** Luke is making pancakes. The recipe calls for 0.5 quart of milk and 2.5 cups of flour. He has $\frac{3}{8}$ quart of milk and $\frac{18}{8}$ cups of flour. Luke makes the recipe with the milk and flour that he has. Explain his error.

_____

_____

_____

27. **Communicate Mathematical Ideas** If you know the order from least to greatest of 5 negative rational numbers, how can you use that information to order the absolute values of those numbers from least to greatest? Explain.

_____

_____

_____

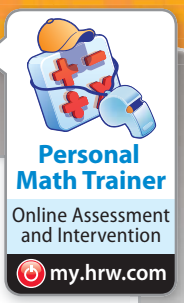
_____

_____

Work Area

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 _____

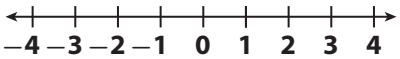
Determine if each number is a whole number, integer, or rational number. Include all sets to which each number belongs.

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?

_____

_____

COMMON CORE

MODULE 3 MIXED REVIEW

Assessment Readiness

Personal Math Trainer

Online Assessment and Intervention

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?

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

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

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

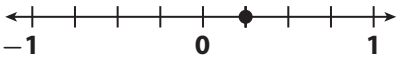
Ⓓ $-\frac{2}{3}, -\frac{1}{5}, 0.4, 2$

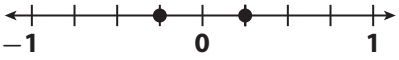
5. What is the absolute value of -12.5?

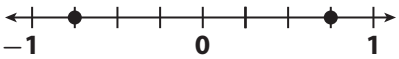
Ⓐ 12.5 Ⓒ -1

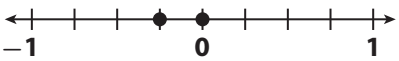
Ⓑ 1 Ⓓ -12.5

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.

_____