School-Home Letter

Vocabulary

equivalent ratios Ratios that name the same comparison.

rate A ratio that compares two quantities that have different units of measure.

ratio A comparison of two quantities by division.

unit rate A rate that compares a quantity to 1 unit.

Dear Family,

Throughout the next few weeks, our math class will be learning about ratios and rates. We will also be learning how to solve problems using equivalent ratios.

You can expect to see homework that provides practice with ratios and rates in a variety of contexts.

Here is a sample of how your child was taught to find an unknown value using equivalent ratios.

🔑 MODEL Use Equivalent Ratios

Solve $\frac{4}{5} = \frac{\blacksquare}{30}$.

STEP 1

Identify a common denominator.

30 is a multiple of 5, so 30 is a common denominator.

STEP 2

Multiply the numerator and denominator of the ratio on the left by 6 to write the ratios with a common denominator.

$$\frac{4 \times 6}{5 \times 6} = \frac{\blacksquare}{30}$$

STEP 3

The denominators are the same, so the numerators are equal.

$$\frac{24}{30} = \frac{\blacksquare}{30}$$

So, $\blacksquare = 24$.

Tips

Equivalent Ratios

You can find equivalent ratios by multiplying or dividing both quantities in a ratio by the same number.

For example,
$\frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28}$, so $\frac{3}{4}$ and $\frac{21}{28}$ are equivalent ratios.

Activity

Keep track of time and distance data on your next family outing. Use this to write and solve problems that involve rates. For example, "We drove 150 miles in 3 hours. At this rate, how far could we have traveled in 5 hours?"

Carta para la casa

Vocabulario

razones equivalentes Razones que nombran la misma comparación.

tasa Una razón que compara dos cantidades que tienen unidades de medida distintas.

razón Una comparación entre dos cantidades hecha con una división.

tasa unitaria Tasa que compara una cantidad con 1 unidad.

Querida familia,

Durante las próximas semanas, en la clase de matemáticas aprenderemos sobre rezones y tasas. También aprenderemos a resolver problemas usando razones equivalentes.

Llevaré a la casa tareas para practicar razones y tasas en diversos contextos.

Este es un ejemplo de la manera como aprenderemos a calcular un valor desconocido usando razones equivalentes.

MODELO Usar razones equivalentes

Resuelve $\frac{4}{5} = \frac{\blacksquare}{30}$.

PASO 1

Identifica un común denominador.

30 es múltiplo de 5, por tanto 30 es un común denominador.

PASO 2

Multiplica el numerador y el denominador de la razón de la izquierda por 6, para escribir las razones con un común denominador.

$\frac{4 \times 6}{5 \times 6} = \frac{\blacksquare}{30}$

PASO 3

Los denominadores son iguales, por tanto los numeradores son iguales.

$\frac{24}{30} = \frac{\blacksquare}{30}$

Por tanto, $\blacksquare = 24$.

Pistas

Razones equivalentes

Puedes hallar razones equivalentes multiplicando o dividiendo ambas cantidades en una razón por el mismo número.

Por ejemplo,
$\frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28}$, por tanto $\frac{3}{4}$ y $\frac{21}{28}$ son razones equivalentes.

Actividad

En su siguiente paseo familiar, lleve la cuenta del tiempo y la distancia. Use esto para escribir y resolver problemas que se relacionen con tasas. Por ejemplo, "Viajamos 150 millas en 3 horas. A este paso, ¿cuánto habríamos viajado en 5 horas?"
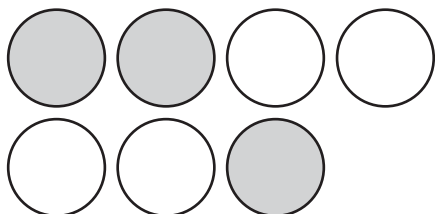
Name _____

Model Ratios

COMMON CORE STANDARD—6.RP.1
Understand ratio concepts and use ratio reasoning to solve problems.

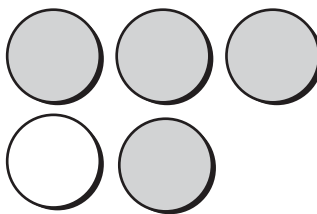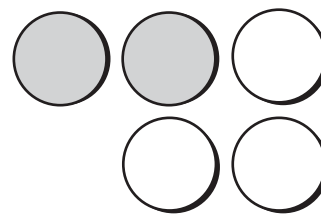**Write the ratio of gray counters to white counters.**

1.

gray:white
3:4

_____

2.

_____

3.

_____

Draw a model of the ratio.

4. 5:1

5. 6:3

Use the ratio to complete the table.

6. Marc is assembling gift bags. For every 2 pencils he places in the bag, he uses 3 stickers. Complete the table to show the ratio of pencils to stickers.

Pencils	2	4	6	8
Stickers	3			

7. Singh is making a bracelet. She uses 5 blue beads for every 1 silver bead. Complete the table to show the ratio of blue beads to silver beads.

Blue	5	10		20
Silver	1		3	

Problem Solving Real World

8. There are 4 quarts in 1 gallon. How many quarts are in 3 gallons?

_____

9. Martin mixes 1 cup lemonade with 4 cups cranberry juice to make his favorite drink. How much cranberry juice does he need if he uses 5 cups of lemonade?

_____

Lesson Check (6.RP.1)

1. Francine is making a necklace that has 1 blue bead for every 6 white beads. How many white beads will she use if she uses 11 blue beads?

2. A basketball league assigns 8 players to each team. How many players can sign up for the league if there are 24 teams?

Spiral Review (6.NS.4, 6.NS.5, 6.NS.6a, 6.NS.7d, 6.NS.8)

3. Louis has 45 pencils and 75 pens to divide into gift bags at the fair. He does not want to mix the pens and pencils. He wants to place an equal amount in each bag. What is the greatest number of pens or pencils he can place in each bag?

4. Of the 24 students in Greg's class, $\frac{3}{8}$ ride the bus to school. How many students ride the bus?

5. Elisa made 0.44 of the free throws she attempted. What is that amount written as a fraction in simplest form?

6. On a coordinate plane, the vertices of a rectangle are $(-1, 1)$, $(3, 1)$, $(-1, -4)$, and $(3, -4)$. What is the perimeter of the rectangle?

Name _____

Ratios and Rates

Write the ratio in two different ways.

1. $\frac{4}{5}$

4 to 5
4:5

_____

2. 16 to 3

_____

3. 9:13

_____

4. $\frac{2}{11}$

_____

5. 7:10

_____

6. $\frac{1}{6}$

_____

7. 22 to 4

_____

8. $\frac{15}{8}$

_____

9. There are 20 light bulbs in 5 packages. Complete the table to find the rate that gives the number of light bulbs in 3 packages. Write this rate in three different ways.

Light Bulbs		8		16	20
Packages	1	2	3	4	5

_____

_____

Problem Solving *Real World*

10. Gemma spends 4 hours each week playing soccer and 3 hours each week practicing her clarinet. Write the ratio of hours spent practicing clarinet to hours spent playing soccer three different ways.

_____

11. Randall bought 2 game controllers at Electronics Plus for $36. What is the unit rate for a game controller at Electronics Plus?

_____

Lesson Check

1. At the grocery store, Luis bought 10 bananas and 4 apples. What are three different ways to write the ratio of apples to bananas?

2. Rita checked out 7 books from the library. She had 2 non-fiction books. The rest were fiction. What are three different ways to write the ratio of non-fiction to fiction?

Spiral Review

3. McKenzie bought 1.2 pounds of coffee for $11.82. What was the cost per pound?

4. Pedro has a bag of flour that weighs $\frac{9}{10}$ pound. He uses $\frac{2}{3}$ of the bag to make gravy. How many pounds of flour does Pedro use to make gravy?

5. Gina draws a map of her town on a coordinate plane. The point that represents the town's civic center is 1 unit to the right of the origin and 4 units above it. What are the coordinates of the point representing the civic center?

6. Stefan draws these shapes. What is the ratio of triangles to stars?

Name _____

Equivalent Ratios and Multiplication Tables

Write two equivalent ratios.

1. Use a multiplication table to write two ratios that are equivalent to $\frac{5}{3}$.

$$\frac{5}{3} = \frac{10}{6}, \frac{15}{9}$$

2.
6		
7		

3.
3		
2		

4.
9		
2		

5.
7		
10		

6. $\frac{4}{5}$

7. $\frac{1}{9}$

8. $\frac{6}{8}$

9. $\frac{11}{1}$

_____   _____   _____   _____

Determine whether the ratios are equivalent.

10. $\frac{2}{3}$ and $\frac{5}{6}$

11. $\frac{5}{10}$ and $\frac{1}{6}$

12. $\frac{8}{3}$ and $\frac{32}{12}$

13. $\frac{9}{12}$ and $\frac{3}{4}$

_____   _____   _____   _____

Problem Solving Real World

14. Tristan uses 7 stars and 9 diamonds to make a design. Write two ratios that are equivalent to $\frac{7}{9}$.

15. There are 12 girls and 16 boys in Javier's math class. There are 26 girls and 14 boys in Javier's choir class. Is the ratio of girls to boys in the two classes equivalent? Explain.

_____   _____

Lesson Check

1. A pancake recipe calls for 4 cups of flour and 3 cups milk. Does a recipe calling for 2 cups flour and 1.5 cups milk use the same ratio of flour to milk?

2. A bracelet is made of 14 red beads and 19 gold beads. A necklace is made of 84 red beads and 133 gold beads. Do the two pieces of jewelry have the same ratio of red beads to gold beads?

Spiral Review

3. Scissors come in packages of 3. Glue sticks come in packages of 10. Martha wants to buy the same number of each. What is the fewest glue sticks Martha can buy?

4. Cole had $\frac{3}{4}$ hour of free time before dinner. He spent $\frac{2}{3}$ of the time playing the guitar. How long did he play the guitar?

5. Delia has $3\frac{5}{8}$ yards of ribbon. About how many $\frac{1}{4}$-yard-long pieces can she cut?

6. Which point is located at -1.1?
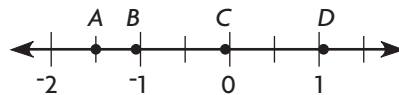
Problem Solving • Use Tables to Compare Ratios

COMMON CORE STANDARD—6.RP.3A
Understand ratio concepts and use ratio reasoning to solve problems.

Read each problem and solve.

1. Sarah asked some friends about their favorite colors. She found that 4 out of 6 people prefer blue, and 8 out of 12 people prefer green. Is the ratio of friends who chose blue to the total asked equivalent to the ratio of friends who chose green to the total asked?

Blue				
Friends who chose blue	4	8	12	16
Total asked	6	12	18	24

Green				
Friends who chose green	8	16	24	32
Total asked	12	24	36	48

Yes, $\frac{4}{6}$ is equivalent to $\frac{8}{12}$.

2. Lisa and Tim make necklaces. Lisa uses 5 red beads for every 3 yellow beads. Tim uses 9 red beads for every 6 yellow beads. Is the ratio of red beads to yellow beads in Lisa's necklace equivalent to the ratio in Tim's necklace?

3. Mitch scored 4 out of 5 on a quiz. Demetri scored 8 out of 10 on a quiz. Did Mitch and Demetri get equivalent scores?

4. Chandra ordered 10 chicken nuggets and ate 7 of them. Raul ordered 15 chicken nuggets and ate 12 of them. Is Chandra's ratio of nuggets ordered to nuggets eaten equivalent to Raul's ratio of nuggets ordered to nuggets eaten?

Lesson Check

1. Mrs. Sahd distributes pencils and paper to students in the ratio of 2 pencils to 10 sheets of paper. Three of these ratios are equivalent to $\frac{2}{10}$. Which one is NOT equivalent?

$\frac{1}{5}$ $\frac{7}{15}$ $\frac{4}{20}$ $\frac{8}{40}$

2. Keith uses 18 cherries and 3 peaches to make a pie filling. Lena uses an equivalent ratio of cherries to peaches when she makes pie filling. Can Lena use a ratio of 21 cherries to 6 peaches? Explain.
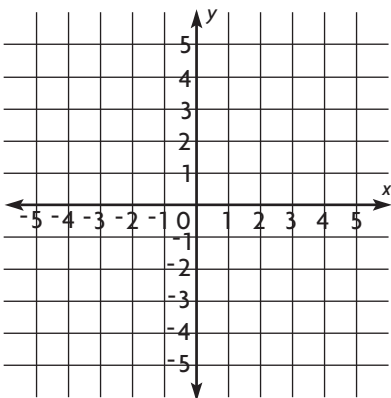
Spiral Review

3. What is the quotient $\frac{3}{20} \div \frac{7}{10}$?
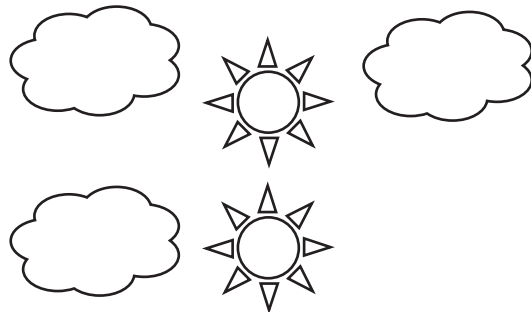
4. Which of these numbers is greater than -2.25 but less than -1?

1 -1.5 0 -2.5

5. Alicia plots a point at $(0, 5)$ and $(0, -2)$. What is the distance between the points?

6. Morton sees these stickers at a craft store. What is the ratio of clouds to suns?

Use Equivalent Ratios

Use equivalent ratios to find the unknown value.

1. $\frac{4}{10} = \frac{\blacksquare}{40}$

$$\frac{4 \times 4}{10 \times 4} = \frac{\blacksquare}{40}$$
$$\frac{16}{40} = \frac{\blacksquare}{40}$$
$$\blacksquare = 16$$

2. $\frac{3}{24} = \frac{33}{\blacksquare}$

3. $\frac{7}{\blacksquare} = \frac{21}{27}$

4. $\frac{\blacksquare}{9} = \frac{12}{54}$

_____

5. $\frac{3}{2} = \frac{12}{\blacksquare}$

6. $\frac{4}{5} = \frac{\blacksquare}{40}$

7. $\frac{\blacksquare}{2} = \frac{45}{30}$

8. $\frac{8}{\blacksquare} = \frac{16}{18}$

_____   _____   _____   _____

9. $\frac{45}{\blacksquare} = \frac{5}{6}$

10. $\frac{\blacksquare}{18} = \frac{7}{3}$

11. $\frac{36}{50} = \frac{18}{\blacksquare}$

12. $\frac{32}{12} = \frac{\blacksquare}{3}$

_____   _____   _____   _____

Problem Solving Real World

13. Honeybees produce 7 pounds of honey for every 1 pound of beeswax they produce. Use equivalent ratios to find how many pounds of honey are produced when 25 pounds of beeswax are produced.

14. A 3-ounce serving of tuna provides 21 grams of protein. Use equivalent ratios to find how many grams of protein are in 9 ounces of tuna.

_____   _____

Lesson Check

1. Jaron paid $2.70 for 6 juice boxes. How much should Jaron expect to pay for 18 juice boxes?

2. A certain shade of orange paint is made by mixing 3 quarts of red paint with 2 quarts of yellow paint. To make more paint of the same shade, how many quarts of yellow paint should be mixed with 6 quarts of red paint?

Spiral Review

3. What is the quotient $2\frac{4}{5} \div 1\frac{1}{3}$?

4. What is the absolute value of $-2\frac{2}{3}$?

5. On a map, a clothing store is located at $(-2, -3)$. A seafood restaurant is located 6 units to the right of the clothing store. What are the coordinates of the restaurant?

6. Marisol plans to make 9 mini-sandwiches for every 2 people attending her party. Write a ratio that is equivalent to Marisol's ratio.

Find Unit Rates

Write the rate as a fraction. Then find the unit rate.

1. A wheel rotates through 1,800° in 5 revolutions.

$$\frac{1{,}800°}{5 \text{ revolutions}}$$

$$\frac{1{,}800° \div 5}{5 \text{ revolutions} \div 5} = \frac{360°}{1 \text{ revolution}}$$

2. There are 312 cards in 6 decks of playing cards.

_____

3. Bana ran 18.6 miles of a marathon in 3 hours.

_____

4. Cameron paid $30.16 for 8 pounds of almonds.

_____

Compare unit rates.

5. An online game company offers a package that includes 2 games for $11.98. They also offer a package that includes 5 games for $24.95. Which package is a better deal?

_____

6. At a track meet, Samma finished the 200-meter race in 25.98 seconds. Tom finished the 100-meter race in 12.54 seconds. Which runner ran at a faster average rate?

_____

7. Elmer Elementary School has 576 students and 24 teachers. Savoy Elementary School has 638 students and 29 teachers. Which school has the lower unit rate of students per teacher?

_____

8. One cell phone company offers 500 minutes of talk time for $49.99. Another company offers 480 minutes for $44.99. Which company offers the better deal?

_____

Problem Solving · Real World

9. Sylvio's flight is scheduled to travel 1,792 miles in 3.5 hours. At what average rate will the plane have to travel to complete the trip on time?

_____

10. Rachel bought 2 pounds of apples and 3 pounds of peaches for a total of $10.45. The apples and peaches cost the same amount per pound. What was the unit rate?

_____

Lesson Check

1. Cran–Soy trail mix costs $2.99 for 5 ounces, Raisin–Nuts mix costs $3.41 for 7 ounces, Lots of Cashews mix costs $7.04 for 8 ounces, and Nuts for You mix costs $2.40 for 6 ounces. List the trail mix brands in order from the least expensive to the most expensive.

2. Aaron's heart beats 166 times in 120 seconds. Callie's heart beats 88 times in 60 seconds. Emma's heart beats 48 times in 30 seconds. Galen's heart beats 22 times in 15 seconds. Which two students' heart rates are equivalent?

Spiral Review

3. Courtlynn combines $\frac{7}{8}$ cup sour cream with $\frac{1}{2}$ cup cream cheese. She then divides the mixture between 2 bowls. How much mixture does Courtlynn put in each bowl?

4. Write a comparison using $<$ or $>$ to show the relationship between $\left|-\frac{2}{3}\right|$ and $-\frac{5}{6}$.

5. There are 18 tires on one truck. How many tires are on 3 trucks of the same type?

6. Write two ratios that are equivalent to $\frac{5}{6}$.

Name _____

Use Unit Rates

COMMON CORE STANDARD—6.RP.3B
Understand ratio concepts and use ratio reasoning to solve problems.

Use a unit rate to find the unknown value.

1. $\frac{34}{17} = \frac{\blacksquare}{7}$

$$\frac{34 \div 17}{17 \div 17} = \frac{\blacksquare}{7}$$

$$\frac{2}{1} = \frac{\blacksquare}{7}$$

$$\frac{2 \times 7}{1 \times 7} = \frac{\blacksquare}{7}$$

$$\frac{14}{7} = \frac{\blacksquare}{7}$$

$$\blacksquare = 14$$

2. $\frac{16}{32} = \frac{\blacksquare}{14}$

3. $\frac{18}{\blacksquare} = \frac{21}{7}$

4. $\frac{\blacksquare}{16} = \frac{3}{12}$

Draw a bar model to find the unknown value.

5. $\frac{15}{45} = \frac{6}{\blacksquare}$

6. $\frac{3}{6} = \frac{\blacksquare}{7}$

7. $\frac{\blacksquare}{6} = \frac{6}{9}$

8. $\frac{7}{\blacksquare} = \frac{2}{10}$

Problem Solving Real World

9. To stay properly hydrated, a person should drink 32 fluid ounces of water for every 60 minutes of exercise. How much water should Damon drink if he rides his bike for 135 minutes?

10. Lillianne made 6 out of every 10 baskets she attempted during basketball practice. If she attempted to make 25 baskets, how many did she make?

Lesson Check

1. Randi's school requires that there are 2 adult chaperones for every 18 students when the students go on a field trip to the museum. If there are 99 students going to the museum, how many adult chaperones are needed?

2. Landry's neighbor pledged $5.00 for every 2 miles he swims in a charity swim-a-thon. If Landry swims 3 miles, how much money will his neighbor donate?

Spiral Review

3. Describe a situation that could be represented by $^-8$.

4. What are the coordinates of point *G*?
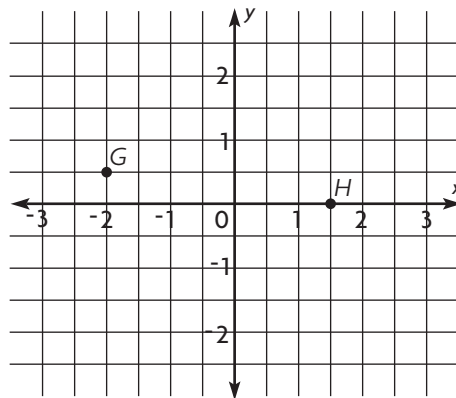
5. Gina bought 6 containers of yogurt for $4. How many containers of yogurt could Gina buy for $12?

6. A bottle containing 64 fluid ounces of juice costs $3.84. What is the unit rate?

Name _____

Equivalent Ratios and Graphs

COMMON CORE STANDARD—6.RP.3A
Understand ratio concepts and use ratio reasoning to solve problems.

Christie makes bracelets. She uses 8 charms for each bracelet. Use this information for 1–4.

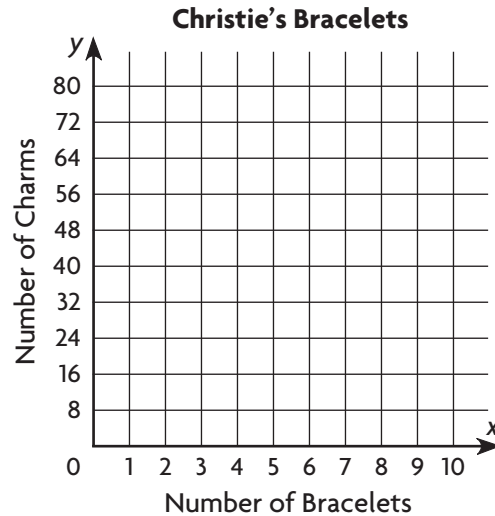**1.** Complete the table of equivalent ratios for the first 5 bracelets.

Charms	8	16	24	32	40
Bracelets	1	2	3	4	5

2. Write ordered pairs, letting the *x*-coordinate represent the number of bracelets and the *y*-coordinate represent the number of charms.

(1, **8**), (2, **16**), (_____ , _____),

(_____ , _____), (_____ , _____)

4. What does the point (1, 8) represent on the graph?

_____

_____

3. Use the ordered pairs to graph the charms and bracelets.

Christie's Bracelets

Number of Charms (y-axis: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80)
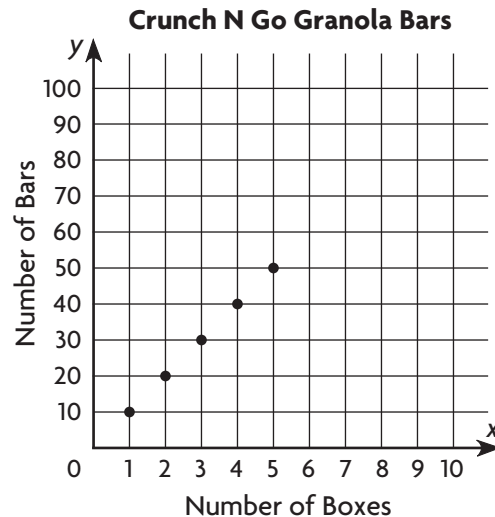Number of Bracelets (x-axis: 1 2 3 4 5 6 7 8 9 10)

The graph shows the number of granola bars that are in various numbers of boxes of Crunch N Go. Use the graph for 5–6.

5. Complete the table of equivalent ratios.

Bars				
Boxes	1	2	3	4

6. Find the unit rate of granola bars per box.

_____

_____

Crunch N Go Granola Bars

Number of Bars (y-axis: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100)
Number of Boxes (x-axis: 1 2 3 4 5 6 7 8 9 10)

Problem Solving *Real World*

7. Look at the graph for Christie's Bracelets. How many charms are needed for 7 bracelets?

_____

8. Look at the graph for Crunch N Go Granola Bars. Stefan needs to buy 90 granola bars. How many boxes must he buy?

_____

Lesson Check

1. A graph shows the distance a car traveled over time. The *x*-axis represents time in hours, and the *y*-axis represents distance in miles. The graph contains the point (3, 165). What does this point represent?

2. Maura charges $11 per hour to babysit. She makes a graph comparing the amount she charges (the *y*-coordinate) to the time she babysits (the *x*-coordinate). Which ordered pair shown is NOT on the graph?

(4, 44)   (11, 1)   (1, 11)   (11, 121)

Spiral Review

3. List 0, ⁻4, and 3 from least to greatest.

4. What two numbers can be used in place of the ■ to make the statement true?

$$|■| = \frac{8}{9}$$

5. Morgan plots the point (4, ⁻7) on a coordinate plane. If she reflects the point across the *y*-axis, what are the coordinates of the reflected point?

6. Jonathan drove 220 miles in 4 hours. Assuming he drives at the same rate, how far will he travel in 7 hours?