UNIT 3

Study Guide Review

MODULE 6

Representing Ratios and Rates

Key Vocabulary

equivalent ratios *(razones equivalentes)*

rate *(tasa)*

ratio *(razón)*

unit rate *(tasa unitaria)*

ESSENTIAL QUESTION

How can you use ratios and rates to solve real-world problems?

EXAMPLE 1

Tina pays $45.50 for 13 boxes of wheat crackers. What is the unit price?

$\frac{\$45.50}{13 \text{ boxes}} = \frac{\$3.50}{1 \text{ box}}$

The unit price is $3.50 per box of crackers.

EXAMPLE 2

A trail mix recipe calls for 3 cups of raisins and 4 cups of peanuts. Mitt made trail mix for a party and used 5 cups of raisins and 6 cups of peanuts. Did Mitt use the correct ratio of raisins to peanuts?

$\frac{3 \text{ cups of raisins}}{4 \text{ cups of peanuts}}$ The ratio of raisins to peanuts in the recipe is $\frac{3}{4}$.

$\frac{5 \text{ cups of raisins}}{6 \text{ cups of peanuts}}$ Mitt used a ratio of $\frac{5}{6}$.

$\frac{3}{4} \times \frac{3}{3} = \frac{9}{12}$ $\frac{5}{6} \times \frac{2}{2} = \frac{10}{12}$ $\frac{9}{12} < \frac{10}{12}$

Mitt used a higher ratio of raisins to peanuts in his trail mix.

EXERCISES

Write three equivalent ratios for each ratio. (Lesson 7.1)

1. $\frac{18}{6}$ _____ **2.** $\frac{5}{45}$ _____ **3.** $\frac{3}{5}$ _____

4. To make a dark orange color, Ron mixes 3 ounces of red paint with 2 ounces of yellow paint. Write the ratio of red paint to yellow paint three ways. (Lesson 7.1) _____

5. A box of a dozen fruit tarts costs $15.00. What is the cost of one fruit tart? (Lesson 7.2) _____

Compare the ratios. (Lesson 7.3)

6. $\frac{2}{5}$ ◯ $\frac{3}{4}$ **7.** $\frac{9}{2}$ ◯ $\frac{10}{7}$ **8.** $\frac{2}{11}$ ◯ $\frac{3}{12}$ **9.** $\frac{6}{7}$ ◯ $\frac{8}{9}$

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MODULE 7

Applying Ratios and Rates

ESSENTIAL QUESTION

How can you use ratios and rates to solve real-world problems?

Key Vocabulary

conversion factor *(factor de conversión)*

proportion *(proporción)*

scale *(escala)*

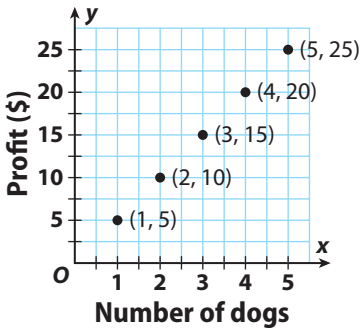
scale drawing *(dibujo a escala)*

EXAMPLE 1

A. Jessica earns $5 for each dog she walks. Complete the table, describe the rule, and tell whether the relationship is additive or multiplicative. Then graph the ordered pairs on a coordinate plane.

Number of dogs	1	2	3	4	5
Profit ($)	5	10	15	20	25

Jessica's profit is the number of dogs walked multiplied by $5. The relationship is multiplicative.



B. A veterinarian tells Lee that his dog should have a 35 centimeter collar. What is this measurement in inches?

Use the conversion factor 1 inch = 2.54 centimeters, written as the rate $\frac{1 \text{ in.}}{2.54 \text{ cm}}$.

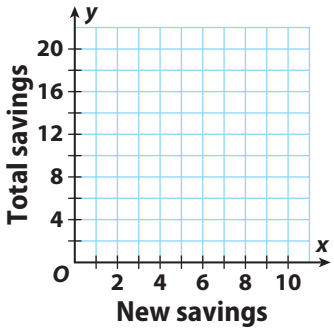
$35 \text{ cm} \cdot \frac{1 \text{ in.}}{2.54 \text{ cm}} \approx 13.78$

The collar should be about 14 inches.

EXERCISES

1. Thaddeus already has $5 saved. He wants to save more to buy a book. Complete the table, and graph the ordered pairs on the coordinate graph. (Lessons 8.1, 8.2)

New savings	4	6	8	10
Total savings	9			



2. There are 2 hydrogen atoms and 1 oxygen atom in a water molecule. Complete the table, and list the equivalent ratios shown on the table. (Lessons 8.1, 8.2)

Hydrogen atoms	8		16	20
Oxygen atoms		6		

3. Sam can solve 30 multiplication problems in 2 minutes. How many can he solve in 20 minutes? (Lesson 8.3)

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4. A male Chihuahua weighs 5 pounds. How many ounces does he weigh? (Lesson 8.4)

_____

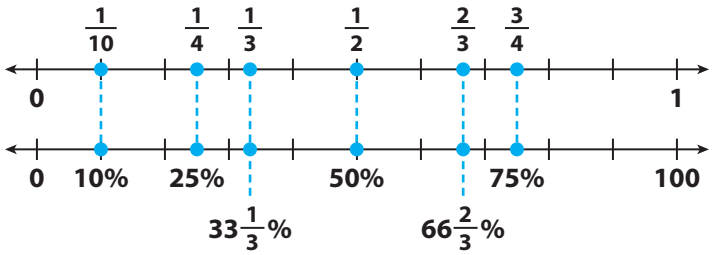
MODULE 8 Percents

ESSENTIAL QUESTION

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

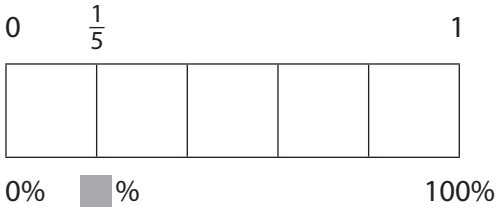
EXAMPLE 1

Find an equivalent percent for $\frac{7}{10}$.



$\frac{7}{10} = 7 \cdot \frac{1}{10}$ $\frac{7}{10} = 7 \cdot 10\%$ $\frac{7}{10} = 70\%$

Find an equivalent percent for $\frac{1}{5}$.



$\frac{1}{5}$ of $100 = 20$, so $\frac{1}{5}$ of $100\% = 20\%$

$\frac{1}{5} = 20\%$

EXAMPLE 2

Thirteen of the 50 states in the United States do not touch the ocean. Write $\frac{13}{50}$ as a decimal and a percent.

$\frac{13}{50} = \frac{26}{100}$ $\frac{26}{100} = 0.26$ $0.26 = 26\%$ $\frac{13}{50} = 0.26 = 26\%$

EXAMPLE 3

Buckner put $60 of his $400 paycheck into his savings account. Find the percent of his paycheck that Buckner saved.

$\frac{60}{400} = \frac{?}{100}$ $\frac{60 \div 4}{400 \div 4} = \frac{15}{100}$ Buckner saved 15% of his paycheck.

EXERCISES

Write each fraction as a decimal and a percent. (Lessons 9.1, 9.2)

1. $\frac{3}{4}$ _____ **2.** $\frac{7}{20}$ _____ **3.** $\frac{8}{5}$ _____

Complete each statement. (Lessons 9.1, 9.2)

4. 25% of 200 is _____. **5.** 16 is _____ of 20. **6.** 21 is 70% of _____.

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7. 42 of the 150 employees at Carlo's Car Repair wear contact lenses. What percent of the employees wear contact lenses? (Lesson 9.3) _____

8. Last week at Best Bargain, 75% of the computers sold were laptops. If 340 computers were sold last week, how many were laptops? (Lesson 9.3) _____

Unit 3 Performance Tasks

1. **CAREERS IN MATH** **Residential Builder** Kaylee, a residential builder, is working on a paint budget for a custom-designed home she is building. A gallon of paint costs $38.50, and its label says it covers about 350 square feet.

a. Explain how to calculate the cost of paint per square foot. Find this value. Show your work.

_____

_____

b. Kaylee measured the room she wants to paint and calculated a total area of 825 square feet. If the paint is only available in one-gallon cans, how many cans of paint should she buy? Justify your answer.

_____

_____

2. Davette wants to buy flannel sheets. She reads that a weight of at least 190 grams per square meter is considered high quality.

a. Davette finds a sheet that has a weight of 920 grams for 5 square meters. Does this sheet satisfy the requirement for high-quality sheets? If not, what should the weight be for 5 square meters? Explain.

_____

b. Davette finds 3 more options for flannel sheets:

Option 1: 1,100 g of flannel in 6 square meters, $45

Option 2: 1,260 g of flannel in 6.6 square meters, $42

Option 3: 1,300 g of flannel in 6.5 square meters, $52

She would like to buy the sheet that meets her requirements for high quality and has the lowest price per square meter. Which option should she buy? Justify your answer.

_____

_____

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Assessment Readiness

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Selected Response

1. The deepest part of a swimming pool is 12 feet deep. The shallowest part of the pool is 3 feet deep. What is the ratio of the depth of the deepest part of the pool to the depth of the shallowest part of the pool?

Ⓐ 4:1
Ⓑ 12:15
Ⓒ 1:4
Ⓓ 15:12

2. How many centimeters are in 15 meters?

Ⓐ 0.15 centimeters
Ⓑ 1.5 centimeters
Ⓒ 150 centimeters
Ⓓ 1,500 centimeters

3. Barbara can walk 3,200 meters in 24 minutes. How far can she walk in 3 minutes?

Ⓐ 320 meters
Ⓑ 400 meters
Ⓒ 640 meters
Ⓓ 720 meters

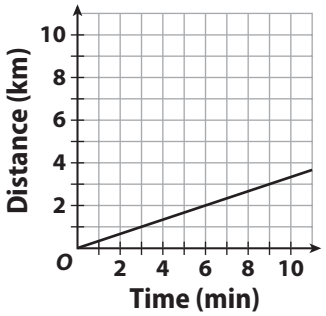
4. The table below shows the number of windows and panes of glass in the windows.

Windows	2	3	4	5
Panes	12	18	24	30

Which represents the number of panes?

Ⓐ windows × 5
Ⓑ windows × 6
Ⓒ windows + 10
Ⓓ windows + 15

5. The graph below represents Donovan's speed while riding his bike.

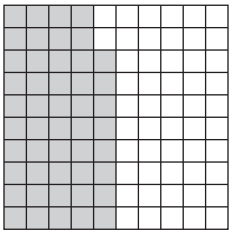


Which would be an ordered pair on the line?

Ⓐ (1, 3)
Ⓑ (2, 2)
Ⓒ (6, 4)
Ⓓ (9, 3)

Hot Tip! **Read the graph or diagram as closely as you read the actual test question. These visual aids contain important information.**

6. Which percent does this shaded grid represent?



Ⓐ 42%
Ⓑ 48%
Ⓒ 52%
Ⓓ 58%

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7. Ivan saves 20% of his monthly paycheck for music equipment. He earned $335 last month. How much money did Ivan save for music equipment?

Ⓐ $65

Ⓑ $67

Ⓒ $70

Ⓓ $75

8. How many 0.6-liter glasses can you fill up with a 4.5-liter pitcher?

Ⓐ 1.33 glasses

Ⓑ 3.9 glasses

Ⓒ 7.3 glasses

Ⓓ 7.5 glasses

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

Ⓐ 22, 8, 7, 2, −11

Ⓑ 2, 7, 8, −11, 22

Ⓒ −11, 2, 7, 8, 22

Ⓓ 22, −11, 8, 7, 2

10. How do you convert 15 feet to centimeters?

Ⓐ Multiply 15 ft by $\frac{1\text{ ft}}{12\text{ in.}}$ and $\frac{2.54\text{ cm}}{1\text{ in.}}$.

Ⓑ Multiply 15 ft by $\frac{1\text{ ft}}{12\text{ in.}}$ and $\frac{1\text{ in.}}{2.54\text{ cm}}$.

Ⓒ Multiply 15 ft by $\frac{12\text{ in.}}{1\text{ ft}}$ and $\frac{2.54\text{ cm}}{1\text{ in.}}$.

Ⓓ Multiply 15 ft by $\frac{12\text{ in.}}{1\text{ ft}}$ and $\frac{1\text{ cm}}{2.54\text{ in.}}$.

Mini Task

11. Claire and Malia are training for a race.

a. Claire runs 10 km in 1 hour. How many kilometers does she run in half an hour? in $2\frac{1}{2}$ hours?

_____

b. Malia runs 5 miles in 1 hour. How many miles does she run in half an hour? in $2\frac{1}{2}$ hours?

_____

c. On Tuesday, Claire and Malia both ran for $2\frac{1}{2}$ hours. Who ran the farther distance?

_____

12. A department store is having a sale.

a. Malcolm bought 6 bowls for $13.20. What is the unit rate?

_____

b. The store is having a promotion. For every 8 glasses you buy, you get 3 free plates. Malcolm got 9 free plates. How many glasses did he buy?

_____

c. The unit rate of the glasses was $1.80 per glass. How much did Malcolm spend on glasses?

_____

13. A recipe calls for 6 cups of water and 4 cups of flour.

a. What is the ratio of water to flour?

_____

b. If the recipe is increased to use 6 cups of flour, how much water should be used?

_____

c. If the recipe is decreased to use 2 cups of water, how much flour should be used?

_____

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