Review Key Vocabulary

ratio, *p. 100*
rate, *p. 100*
unit rate, *p. 100*
slope, *p. 106*

proportion, *p. 112*
proportional, *p. 112*
cross products, *p. 113*
U.S. customary system,
  p. 132

metric system, *p. 132*
direct variation, *p. 138*
inverse variation, *p. 144*

Review Examples and Exercises

3.1 Ratios and Rates (pp. 98–103)

Find the unit rate of calories per serving.

Servings	2	4	6	8
Calories	240	480	720	960

The calories increase by 240 for every 2 servings.

$$\frac{\text{change in calories}}{\text{change in servings}} = \frac{240}{2} = \frac{120}{1}$$
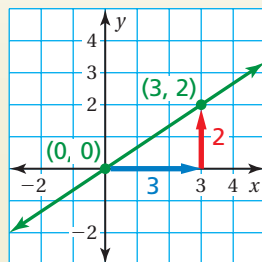
⋮• The rate is 120 calories per serving.

Exercises

Find the unit rate.

1. 289 miles on 10 gallons

2. 975 revolutions in 3 minutes

3.2 Slope (pp. 104–109)

Find the slope of the line.

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x}$$

$$= \frac{2}{3}$$

⋮• The slope of the line is $\frac{2}{3}$.

Exercises

Graph the line that passes through the two points. Then find the slope of the line.

3. $(-3, -3), (1, 1)$

4. $(-3, -2), (3, 2)$

5. $(3, 9), (-2, -6)$

Proportions *(pp. 110–115)*

Tell whether the ratios $\frac{9}{12}$ and $\frac{6}{8}$ form a proportion.

$$\frac{9}{12} = \frac{9 \div 3}{12 \div 3} = \frac{3}{4} \qquad \frac{6}{8} = \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$$

∴ The ratios are equivalent. So, the ratios form a proportion.

Exercises

Tell whether the ratios form a proportion.

6. $\frac{4}{9}, \frac{2}{3}$ **7.** $\frac{12}{22}, \frac{18}{33}$ **8.** $\frac{8}{50}, \frac{4}{10}$ **9.** $\frac{32}{40}, \frac{12}{15}$

Writing Proportions *(pp. 116–121)*

Write a proportion that gives the number r of returns on Saturday.

	Friday	Saturday
Sales	40	85
Returns	32	r

$$\frac{40 \text{ sales}}{32 \text{ returns}} = \frac{85 \text{ sales}}{r \text{ returns}}$$

Exercises

Use the table to write a proportion.

10.

	Game 1	Game 2
Penalties	6	8
Minutes	16	m

11.

	Concert 1	Concert 2
Songs	15	18
Hours	2.5	h

Solving Proportions *(pp. 122–127)*

Solve $\frac{x}{9} = \frac{4}{5}$.

$x \cdot 5 = 9 \cdot 4$ Use the Cross Products Property.

$5x = 36$ Multiply.

$x = 7.2$ Divide.

Exercises

Solve the proportion.

12. $\frac{x}{4} = \frac{2}{5}$ **13.** $\frac{5}{12} = \frac{y}{15}$ **14.** $\frac{z}{7} = \frac{3}{16}$ **15.** $\frac{8}{20} = \frac{6}{w}$

Converting Measures Between Systems *(pp. 130–135)*

Convert 8 kilometers to miles.

$$8 \text{ km} \times \frac{1 \text{ mi}}{1.6 \text{ km}} \approx 5 \text{ mi} \qquad \text{1 mi} \approx \text{1.6 km, so use the ratio } \frac{1 \text{ mi}}{1.6 \text{ km}}.$$

Exercises

Copy and complete the statement. Round to the nearest hundredth, if necessary.

16. $3 \text{ L} \approx \boxed{} \text{ qt}$ **17.** $9 \text{ in.} \approx \boxed{} \text{ cm}$ **18.** $15 \text{ lb} \approx \boxed{} \text{ kg}$

3.7 **Direct Variation** *(pp. 136–141)*

Tell whether x and y show direct variation. Explain your reasoning.

a. $x + y - 1 = 3$

$y = 4 - x$ Solve for y.

⋮ The equation *cannot* be written as $y = kx$. So, x and y do *not* show direct variation.

b. $x = 8y$

$\frac{1}{8}x = y$ Solve for y.

⋮ The equation can be written as $y = kx$. So, x and y show direct variation.

Exercises

Tell whether x and y show direct variation. Explain your reasoning.

19. $x + y = 6$ **20.** $y - x = 0$ **21.** $\dfrac{x}{y} = 20$ **22.** $x = y + 2$

3.8 **Inverse Variation** *(pp. 142–147)*

Tell whether x and y show inverse variation. Explain your reasoning.

$xy = 5$

$y = \dfrac{5}{x}$ Solve for y.

⋮ The equation can be written as $y = \dfrac{k}{x}$. So, x and y show inverse variation.

Exercises

Tell whether x and y show *direct variation*, *inverse variation*, or *neither*. Explain your reasoning.

23. $\dfrac{x}{y} = 6$ **24.** $3x + y = 7$ **25.** $8y = 4x$ **26.** $xy = 12$