Name _____   Date _____

Study Guide
For use with the lesson "Write Ratios and Proportions"

GOAL **Find ratios and write and solve proportions.**

Vocabulary

A **ratio** uses division to compare two quantities. You can write a ratio of two quantities a and b, where b is not equal to 0, in three ways.

a to b $\qquad\qquad$ $a:b$ $\qquad\qquad$ $\dfrac{a}{b}$

Each ratio is read "the ratio of a to b." Ratios should be written in simplest form.

A **proportion** is an equation that states that two ratios are equivalent.

EXAMPLE 1 **Write a ratio**

A shoe store sells 15 pairs of women's shoes and 12 pairs of men's shoes. Find the specified ratio.

  a. Find the ratio of women's shoe sales to men's shoe sales.

  b. Find the ratio of men's shoe sales to total shoe sales.

Solution

  a. $\dfrac{\text{women's shoe sales}}{\text{men's shoe sales}} = \dfrac{15}{12} = \dfrac{5}{4}$

  b. $\dfrac{\text{men's shoe sales}}{\text{total shoe sales}} = \dfrac{12}{15+12} = \dfrac{12}{27} = \dfrac{4}{9}$

EXAMPLE 2 **Solve a proportion**

Solve the proportion $\dfrac{7}{9} = \dfrac{x}{54}$.

Solution

$\dfrac{7}{9} = \dfrac{x}{54}$ $\qquad\qquad$ Write original proportion.

$54 \cdot \dfrac{7}{9} = 54 \cdot \dfrac{x}{54}$ $\qquad\qquad$ Multiply each side by 54.

$\dfrac{378}{9} = x$ $\qquad\qquad$ Simplify.

$42 = x$ $\qquad\qquad$ Divide.

LESSON 2.6

Study Guide *continued*

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Exercises for Examples 1 and 2

A family has 75 VCR movies and 120 DVD movies. Find the specified ratio.

1. The number of VCR movies to the number of DVD movies

2. The number of DVD movies to the entire movie collection

Solve the proportion. Check your solution.

3. $\dfrac{x}{72} = \dfrac{3}{8}$

4. $\dfrac{9}{18} = \dfrac{y}{90}$

5. $\dfrac{z}{16} = \dfrac{96}{128}$

EXAMPLE 3 ### Solve a multi-step problem

A restaurant owner uses 3 cloves of garlic for every 5 pints of sauce. The restaurant uses 210 pints of sauce during the day. Find the number of cloves of garlic the restaurant uses to make the sauce.

Solution

STEP 1 **Write** a proportion involving two ratios that compare the amount of garlic to the pints of sauce.

$$\dfrac{3}{5} = \dfrac{x}{210} \quad \longleftarrow \text{cloves of garlic} \\ \qquad\qquad \longleftarrow \text{pints of sauce}$$

STEP 2 **Solve** the proportion.

$\dfrac{3}{5} = \dfrac{x}{210}$ Write original proportion.

$210 \cdot \dfrac{3}{5} = 210 \cdot \dfrac{x}{210}$ Multiply each side by 210.

$\dfrac{630}{5} = x$ Divide.

$126 = x$ Simplify.

The restaurant uses 126 cloves of garlic to make the sauce.

Exercises for Example 3

6. A secretary can type 32 words in 60 seconds. How many words can the secretary type in 150 seconds?

7. A secretary can type 48 words in 60 seconds. How many words can the secretary type in 400 seconds?

LESSON 2.6