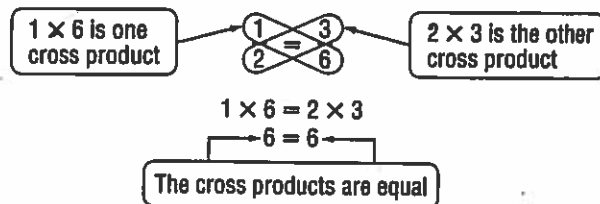


## 10-2

## Study Guide and Intervention

## Solving Proportions

A proportion is an equation stating that two ratios are equivalent. For example, the ratios  $\frac{1}{2}$  and  $\frac{3}{6}$  are equivalent, so the equation  $\frac{1}{2} = \frac{3}{6}$  is a proportion. In order for two ratios to form a proportion, their cross products must be equal.



When one value in a proportion is unknown, you can use cross products to solve the proportion.

**EXAMPLE 1** Solve  $\frac{2}{5} = \frac{4}{n}$ .

$$2 \times n = 5 \times 4 \quad \text{Cross products}$$

$$2n = 20 \quad \text{Multiply.}$$

$$\frac{2n}{2} = \frac{20}{2} \quad \text{Divide each side by 2.}$$

$$n = 10$$

The solution is 10.

**EXAMPLE 2** Solve  $\frac{3}{4} = \frac{b}{12}$ .

$$3 \times 12 = 4 \times b \quad \text{Cross products}$$

$$36 = 4b \quad \text{Multiply.}$$

$$\frac{36}{4} = \frac{4b}{4} \quad \text{Divide each side by 4.}$$

$$9 = b$$

The solution is 9.

## EXERCISES

Determine whether each pair of ratios form a proportion. Explain your reasoning.

1.  $\frac{3}{5}, \frac{6}{10}$

2.  $\frac{2}{9}, \frac{4}{16}$

Solve each proportion.

3.  $\frac{2}{3} = \frac{8}{n}$

4.  $\frac{3}{4} = \frac{12}{x}$

5.  $\frac{2}{4} = \frac{y}{8}$

6.  $\frac{3}{5} = \frac{b}{15}$

7.  $\frac{1.2}{9} = \frac{c}{1.5}$

8.  $\frac{d}{16} = \frac{3}{8}$

9.  $\frac{x}{2.6} = \frac{1.5}{1.3}$

10.  $\frac{2}{y} = \frac{6}{9}$

11.  $\frac{0.1}{2.6} = \frac{0.5}{z}$

**Practice: Word Problems****Solving Proportions**

1. **SCHOOL** The ratio of boys to girls in history class is 4 to 5. How many girls are in the class if there are 12 boys in the class? Explain.

2. **FACTORIES** A factory produces 6 motorcycles in 9 hours. Write a proportion and solve it to find how many hours it takes to produce 16 motorcycles.

3. **READING** James read 4 pages in a book in 6 minutes. How long would you expect him to take to read 6 pages?

4. **COOKING** A recipe that will make 3 pies calls for 7 cups of flour. Write a proportion and solve it to find how many pies can be made with 28 cups of flour.

5. **TYPING** Sara can type 90 words in 4 minutes. About how many words would you expect her to type in 10 minutes?

6. **BASKETBALL** The Lakewood Wildcats won 5 of their first 7 games this year. There are 28 games in the season. About how many games would you expect the Wildcats to win this season? Explain your reasoning.

7. **FOOD** Two slices of Dan's Famous Pizza have 230 Calories. How many Calories would you expect to be in 5 slices of the same pizza?

8. **SHOPPING** Andy paid \$1.40 for 4 grapefruits. Write a proportion and solve it to find how many grapefruits he can purchase for \$2.10.