

Lesson 6 Reteach

Solve Proportional Relationships

A **proportion** is an equation that states that two ratios are equivalent. To determine whether a pair of ratios forms a proportion, use cross products. You can also use cross products to solve proportions.

Example 1

Determine whether the pair of ratios $\frac{20}{24}$ and $\frac{12}{18}$ form a proportion.

Find the cross products.

$$\begin{array}{l} \frac{20}{24} = \frac{12}{18} \rightarrow 24 \cdot 12 = 288 \\ \frac{24}{18} = \frac{20}{12} \rightarrow 20 \cdot 18 = 360 \end{array}$$

Since the cross products are not equal, the ratios do not form a proportion.

Example 2

Solve $\frac{12}{30} = \frac{k}{70}$.

$$\frac{12}{30} = \frac{k}{70}$$

$$12 \cdot 70 = 30 \cdot k$$

$$840 = 30k$$

$$\frac{840}{30} = \frac{30k}{30}$$

$$28 = k$$

Write the equation.

Find the cross products.

Multiply.

Divide each side by 30.

Simplify.

The solution is 28.

Exercises

Determine whether each pair of ratios forms a proportion.

1. $\frac{17}{10}, \frac{12}{5}$

2. $\frac{6}{9}, \frac{12}{18}$

3. $\frac{8}{12}, \frac{10}{15}$

4. $\frac{7}{15}, \frac{13}{32}$

5. $\frac{7}{9}, \frac{49}{63}$

6. $\frac{8}{24}, \frac{12}{28}$

7. $\frac{4}{7}, \frac{12}{71}$

8. $\frac{20}{35}, \frac{30}{45}$

9. $\frac{18}{24}, \frac{3}{4}$

Solve each proportion.

10. $\frac{x}{5} = \frac{15}{25}$

11. $\frac{3}{4} = \frac{12}{c}$

12. $\frac{6}{9} = \frac{10}{r}$

13. $\frac{16}{24} = \frac{z}{15}$

14. $\frac{5}{8} = \frac{s}{12}$

15. $\frac{14}{t} = \frac{10}{11}$

16. $\frac{w}{6} = \frac{2.8}{7}$

17. $\frac{5}{y} = \frac{7}{16.8}$

18. $\frac{x}{18} = \frac{7}{36}$

Lesson 6 Homework Practice

Solve Proportional Relationships

Solve each proportion.

1. $\frac{b}{5} = \frac{8}{16}$

2. $\frac{18}{x} = \frac{6}{10}$

3. $\frac{t}{6} = \frac{30}{36}$

4. $\frac{11}{10} = \frac{n}{14}$

5. $\frac{2.5}{35} = \frac{2}{d}$

6. $\frac{3.5}{18} = \frac{z}{36}$

7. $\frac{0.45}{4.2} = \frac{p}{14}$

8. $\frac{2.4}{6} = \frac{2.8}{s}$

9. $\frac{3.6}{k} = \frac{0.2}{0.5}$

For Exercises 10–12, assume all situations are proportional.

10. CLASSES For every girl taking classes at the martial arts school, there are 3 boys who are taking classes at the school. If there are 236 students taking classes, write and solve a proportion to predict the number of boys taking classes at the school.

11. BICYCLES An assembly line worker at Rob's Bicycle factory adds a seat to a bicycle at a rate of 2 seats in 11 minutes. Write a proportion relating the number of seats s to the number of minutes m . At this rate, how long will it take to add 16 seats? 19 seats?

12. PAINTING Lisa is painting a fence that is 26 feet long and 7 feet tall. A gallon of paint will cover 350 square feet. Write and solve a proportion to determine how many gallons of paint Lisa will need.