

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. $\frac{17}{10}, \frac{12}{5}$ **no**

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

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

4. $\frac{7}{15}, \frac{13}{32}$ **no**

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

6. $\frac{8}{24}, \frac{12}{28}$ **no**

7. $\frac{4}{7}, \frac{12}{71}$ **no**

8. $\frac{20}{35}, \frac{30}{45}$ **no**

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

Solve each proportion.

10. $\frac{x}{5} = \frac{15}{25}$ **3**

11. $\frac{3}{4} = \frac{12}{c}$ **16**

12. $\frac{6}{9} = \frac{10}{r}$ **15**

13. $\frac{16}{24} = \frac{z}{15}$ **10**

14. $\frac{5}{8} = \frac{s}{12}$ **7.5**

15. $\frac{14}{t} = \frac{10}{11}$ **15.4**

16. $\frac{w}{6} = \frac{2.8}{7}$ **2.4**

17. $\frac{5}{y} = \frac{7}{16.8}$ **12**

18. $\frac{x}{18} = \frac{7}{36}$ **3.5**