



Name \_\_\_\_\_ Date \_\_\_\_\_

## Solving Proportions (pages 317–320)

A **proportion** is an equation that shows that two ratios are equivalent. The general form of a proportion is  $\frac{a}{b} = \frac{c}{d}$ , where neither  $b$  nor  $d$  is equal to zero. The **cross products** of a proportion are  $ad$  and  $bc$ .

<b>Property of Proportions</b>	The cross products of a proportion are equal. If $\frac{a}{b} = \frac{c}{d}$ , then $ad = bc$ .
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### EXAMPLES

**A** Use cross products to find out whether this pair of ratios forms a proportion.

$$\frac{3}{4}, \frac{9}{12}$$

Does  $\frac{3}{4} = \frac{9}{12}$ ? Are the cross products equal?

Does  $3 \times 12 = 4 \times 9$ ? Yes, because  $36 = 36$ .

$\frac{3}{4} = \frac{9}{12}$  is a proportion because the cross products are equal.

**B** Solve the proportion  $\frac{2}{7} = \frac{y}{21}$  for  $y$ .

Write the cross products.

$$2 \times 21 = 7 \times y$$

$$42 = 7y$$

$$\frac{42}{7} = \frac{7y}{7} \quad \text{Divide each side of the equation by 7.}$$

$$6 = y$$

The solution is 6.

### Try These Together

1. Use cross products to determine whether this pair of ratios forms a proportion.  $\frac{0.5}{2}, \frac{0.4}{1.6}$

*HINT: Write the proportion with a ? over the =, and test to see if the cross products are really equal.*

2. Solve the proportion  $\frac{3}{p} = \frac{4}{20}$ .

*HINT: Set the cross products equal to each other and solve for  $p$ .*

### PRACTICE

Determine whether each pair of ratios forms a proportion.

3.  $\frac{1}{2}, \frac{5}{10}$

4.  $\frac{4}{8}, \frac{2}{4}$

5.  $\frac{4}{5}, \frac{1}{8}$

6.  $\frac{8}{13}, \frac{2}{5}$

Solve each proportion.

7.  $\frac{3}{6} = \frac{x}{2}$

8.  $\frac{4}{w} = \frac{2}{11}$

9.  $\frac{9}{12} = \frac{6}{z}$

10.  $\frac{d}{25} = \frac{2}{10}$



**11. Standardized Test Practice** The home economics class is making a casserole. They need 3 eggs for 1 casserole. How many eggs do they need for 4 casseroles?

**A** 9

**B** 12

**C** 15

**D** 10

Answers: 1. yes 2. 15 3. yes 4. yes 5. no 6. no 7. 1 8. 22 9. 8 10. 5 11. B