

9-4 Using Proportions (Pages 444–447)

A **proportion** is a statement that two or more ratios are equal, as in $\frac{a}{b} = \frac{c}{d}$. The products ad and cb are called the **cross products** of the proportion. One way to determine if two ratios form a proportion is to check their cross products.

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

A Solve $\frac{6}{y} = \frac{3}{2}$.

$6 \cdot 2 = y \cdot 3$ *Cross products*
 $12 = 3y$ *Multiply.*

$\frac{12}{3} = \frac{3y}{3}$ *Divide each side by 3.*
 $4 = y$

The solution is 4.

B Replace the ● with = or ≠ to make a true statement.

$\frac{2}{5} \bullet \frac{28}{70}$

Examine the cross products.

$2 \cdot 70 \stackrel{?}{=} 5 \cdot 28$

$140 = 140$

Since the cross products are equal, $\frac{2}{5} = \frac{28}{70}$.

PRACTICE

Replace each ● with = or ≠ to make a true statement.

1. $\frac{2}{5} \bullet \frac{8}{20}$

2. $\frac{3}{4} \bullet \frac{18}{24}$

3. $\frac{2.5}{7.5} \bullet \frac{2}{6}$

4. $\frac{84}{96} \bullet \frac{7}{8}$

5. $\frac{1}{5} \bullet \frac{19}{90}$

Solve each proportion.

6. $\frac{x}{5} = \frac{77}{35}$

7. $\frac{6}{m} = \frac{1}{36}$

8. $\frac{12}{17} = \frac{n}{68}$

9. $\frac{45}{x} = \frac{2}{3}$

10. $\frac{4}{7} = \frac{5.2}{x}$

Write a proportion that could be used to solve for each variable. Then solve the proportion.

11. 3 pounds for \$2.50
2 pounds for n dollars

12. 3 notepads have 144 sheets
 x notepads have 240 sheets

13. **Food** To make a fruit salad, Jeff will use 3 oranges for every 2 people. If the salad is to serve 12 people, how many oranges will he use?



14. **Standardized Test Practice** A display case of old CDs are marked 2 for \$15. If you pick out 5 CDs, how much will they cost, not including tax?

A \$67.50

B \$60

C \$38

D \$37.50

Answers: 1. = 2. = 3. = 4. = 5. ≠ 6. 11 7. 216 8. 48 9. 67.5 10. 9.1 11. \$1.67 12. 5 13. 18 oranges 14. D
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