

Solving Ratios

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Mathematics 9
Similar Triangles
Solving Ratios with Proportions

A. Definitions

1. Ratio: a comparison of two items usually in the form of a fraction.
2. Proportion: a statement that two ratios are equal.
3. Equation: a mathematical statement comparing two amounts that are the same.

B. Solving Ratios using Equations

Solve and check the following equations.

$$1) \left[\frac{x}{3} = \frac{-8}{12} \right]$$

$$\frac{4}{4}x = \frac{-8}{4}$$

$$\boxed{x = -2}$$

check.

$$\frac{x}{3} = \frac{-8}{12}$$

$$\frac{(-2)}{3} = \frac{-8}{12}$$

$$\frac{-2}{3} = \frac{-2}{3} \checkmark$$

$$2) \left[\frac{6}{8} = \frac{9}{2x} \right]$$

$$2x(6) = 8(9)$$

$$\frac{12x}{12} = \frac{72}{12}$$

$$\boxed{x = 6}$$

check.

$$\frac{6}{8} = \frac{9}{2x}$$

$$\frac{6}{8} = \frac{9}{2(6)}$$

$$\frac{6}{8} = \frac{9}{12}$$

$$\frac{3}{4} = \frac{3}{4} \checkmark$$

$$16. \quad 3) \left[\frac{4}{16} = \frac{x-5}{8} \right]$$

$$4 = 2(x-5)$$

$$4 = 2x - 10$$

$$\frac{14}{2} = \frac{2x}{2}$$

$$\boxed{\begin{array}{l} 7 = x \\ \text{or} \\ x = 7 \end{array}}$$

check.

$$\frac{4}{16} = \frac{x-5}{8}$$

$$\frac{4}{16} = \frac{(7)-5}{8}$$

$$\frac{4}{16} = \frac{2}{8}$$

$$\frac{1}{4} = \frac{1}{4} \checkmark$$

$$2(x+1) \quad 4) \left[\frac{12}{x+1} = \frac{3}{2} \right]$$

$$2(12) = 3(x+1)$$

$$24 = 3x + 3$$

$$\frac{21}{3} = \frac{3x}{3}$$

$$\boxed{\begin{array}{l} 7 = x \\ \text{or} \\ x = 7 \end{array}}$$

check

$$\frac{12}{x+1} = \frac{3}{2}$$

$$\frac{12}{(7)+1} = \frac{3}{2}$$

$$\frac{12}{8} = \frac{3}{2}$$

$$\frac{3}{2} = \frac{3}{2} \checkmark$$

$$3x(x-2) \quad 5) \left[\frac{1}{x-2} = \frac{4}{3x} \right]$$

$$3x(1) = 4(x-2)$$

$$3x = 4x - 8$$

$$\frac{-x}{-1} = \frac{-8}{-1}$$

$$\boxed{x = 8}$$

check

$$\frac{1}{x-2} = \frac{4}{3x}$$

$$\frac{1}{(8)-2} = \frac{4}{3(8)}$$

$$\frac{1}{6} = \frac{4}{24}$$

$$\frac{1}{6} = \frac{1}{6} \checkmark$$

Assignment:

Solving Ratios With Proportions Assignment

Name: _____

Solving Ratios With Proportions Assignment

Solve and check the following equations.

1. $\frac{3}{8} = \frac{x}{24}$	<u>Check</u>
2. $\frac{x}{15} = \frac{-4}{5}$	<u>Check</u>
3. $\frac{2x}{8} = \frac{12}{16}$	<u>Check</u>

4. $\frac{-2x}{5} = \frac{8}{10}$	<u>Check</u>
5. $\frac{12}{3x} = \frac{4}{5}$	<u>Check</u>
6. $\frac{12}{9} = \frac{-8}{6x}$	<u>Check</u>

7. $\frac{-12}{2x+2} = 2$	<u>Check</u>
8. $\frac{2}{2x} = \frac{1}{4x-12}$	<u>Check</u>
9. $\frac{6x+10}{5} = x$	<u>Check</u>

10. $\frac{-8}{x+2} = \frac{4}{3}$	<u>Check</u>
11. $\frac{6}{x+4} = \frac{3}{2}$	<u>Check</u>
12. $\frac{6}{2x+2} = \frac{2}{x}$	<u>Check</u>

Answers

1) $x = 9$

2) $x = -12$

3) $x = 3$

4) $x = -2$

5) $x = 5$

6) $x = -1$

7) $x = -4$

8) $x = 4$

9) $x = -10$

10) $x = -8$

11) $x = 0$

12) $x = 2$