

Algebra I

3-5

Write Ratios and Proportions

Ratio - Two numbers compared to each other by division.

$$\frac{a}{b} \text{ or } a \text{ to } b \text{ or } a:b$$

Proportion - Two ratios that are equal.

$$\frac{a}{b} = \frac{c}{d}$$

Solve.

$$1) \left(\frac{x}{5} = \frac{3}{4} \right) \times 5$$
$$x = \frac{15}{4}$$
$$\left\{ \frac{15}{4} \right\}$$

$$2) \frac{18x}{13} = \frac{36}{39} \div 3$$
$$13 \left(\frac{18x}{13} \right) = \left(\frac{12}{13} \right) \times 13$$
$$\frac{18x}{18} = \frac{12}{18} \div 6$$
$$x = \frac{2}{3}$$
$$\left\{ \frac{2}{3} \right\}$$

$$3) \left(\frac{21}{8x} = \frac{7}{4} \right) \times 8x$$
$$\frac{21}{14} = \frac{14x}{14}$$
$$\frac{3}{2} = x$$
$$\left\{ \frac{3}{2} \right\}$$

$$4) \left(\frac{x-5}{4} = \frac{3}{2} \right) \times 4$$
$$x-5 = 6$$
$$x-5+5 = 6+5$$
$$x = 11$$
$$\left\{ 11 \right\}$$

Solve.

$$5) \left(\frac{3+2y}{1.8} = \frac{1-y}{3.6} \right) \times 3.6$$
$$2(3+2y) = 1-y$$
$$6+4y = 1-y$$
$$6+4y+y = 1-y+y$$
$$6+5y = 1$$
$$6-6+5y = 1-6$$
$$5y = -5$$
$$y = -1$$
$$\left\{ -1 \right\}$$

Write each sentence as a proportion, then solve.

6) [Nine is to four as some number is to twenty-eight.]

$$\left(\frac{9}{4} = \frac{x}{28} \right) \times 28$$
$$63 = x$$
$$\left\{ 63 \right\}$$

7) [The ratio of some number to thirty-two is the same as the ratio of seven to eight.]

$$32 \left(\frac{x}{32} = \frac{7}{8} \right)$$
$$x = 28$$
$$\left\{ 28 \right\}$$

8) An empty swimming pool is being filled with water. After 5 minutes, the pool has 400 gallons of water. If the pool has a volume of 11,200 gallons, how long does it take to fill the empty pool?

Ratio method

$$\left(\frac{5}{400} = \frac{x}{11,200} \right) 11,200$$

$$140 = x$$

$$140 \text{ min} = 2 \text{ hr} + 20 \text{ min}$$

Science - Conversion method

$$11,200 \text{ gal} \times \frac{5 \text{ min}}{400 \text{ gal}} = 140 \text{ min}$$

Assignment:

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1, 4-18 even,

19-22,

23-41 odd,

46-53