

Objective: SWBAT solve for variables using proportions and be able to explain, verbally, in their own words the process for solving proportions.

Warm Up:

1. In the space provided, please write down everything you know about proportions.

2. Solve for x: $\cancel{5} \cdot \frac{2x+4}{\cancel{5}} = 4 \cdot \cancel{5}$

$$\begin{array}{rcl} 2x+4 & = & 20 \\ -4 & -4 & \\ \hline 2x & = & 16 \\ \frac{2x}{2} & \frac{16}{2} & \\ x & = & 8 \end{array}$$

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Proportions

Sept 8

I will solve for variables that are set up in proportion like problems

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Comparing 2 numbers is called a ratio. $3:5$ $\frac{3}{5}$

Example: scoring a 19 out of 20 on a test.

Ways to write a ratio: $\frac{19}{20}$ $19:20$ 0.95 95%

When you divide 19 by 20, the decimal ends, or terminates. $\frac{19}{20} = 0.95$

Sometimes you get a repeating decimal.

$$\frac{210}{330} = 0.6\overline{363}....$$

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A proportion is an equation showing two ratios are equal to each other.

■ Similar to reducing fractions

Examples: $\frac{2}{3} = \frac{4}{6}$ $\frac{1}{2} = \frac{3}{6} = \frac{2}{4} = \frac{1}{2}$ $\frac{12}{24} = \frac{x}{48}$

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Solving for a variable using proportions:

$$\frac{2}{5} = \frac{x}{45}$$

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Cross-multiplication

$$\frac{2}{5} = \frac{x}{45}$$

$$5 \cdot x = 2 \cdot 45$$

$$\frac{5x}{5} = \frac{90}{5}$$

$$x = 18$$

Fish method

$$\frac{2}{5} = \frac{x}{45}$$

$$\frac{45 \cdot 2}{5} = x$$

$$\frac{90}{5} = 18$$

$$x = 18$$

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$$\frac{b}{15} = \frac{3}{5}$$

$$\begin{array}{r} \times 15 \\ 3 \\ \hline 45 \end{array}$$

$$\frac{5b}{5} = \frac{45}{5}$$

$$b = 9$$

$$\frac{-6}{x} = \frac{-24}{12}$$

$$x \cdot 24 = -6 \times 12$$

$$\frac{-24x}{-24} = \frac{72}{-24} \quad (x = -3)$$

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$$\frac{5}{10} = \frac{10}{x-1}$$
$$5(x-1) = 10 \cdot 10$$
$$5x - 5 = 100$$
$$\begin{array}{r} +5 \quad +5 \\ \hline 5x = 105 \end{array}$$
$$\frac{5x}{5} = \frac{105}{5}$$
$$x = 21$$

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$$\frac{3}{4} = \frac{6}{b-5}$$
$$3(b-5) = 4 \cdot 6$$
$$3b - 15 = 24$$
$$\begin{array}{r} +15 +15 \\ \hline 3b = 39 \end{array}$$
$$\begin{array}{r} 3 \quad 3 \end{array}$$
$$b = 13$$

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$$\frac{6}{p+7} = \frac{5}{10}$$

$$p=5$$

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