

**Content and Language Objective:**

**Students will be able to solve for variables using proportions and be able to explain in their own words the process for solving proportions.**

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Warm - Up

1. Write 5 irrational numbers.

$\sqrt{12}$ ,  $\pi$ ,  $\sqrt{7}$ ,  $\sqrt{2}$ ,  $\sqrt{3}$

2. Write 5 rational numbers.

$.5$ ,  $\frac{22}{7}$ ,  $.1$ ,  $0.\overline{33}$ ,  $-7$

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**Keywords:**

- Ratios
- Proportions
- Terminates
- Repeating Decimal
- Variable

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Comparing 2 numbers is called a ratio.

Example: Scoring 19 out of 20 points on a test.

Ways to write a ratio:

most  $\frac{19}{20}$  ~~19 to 20~~ 19:20 0.95 95%  
Common

When you divide 19 by 20, the decimal ends or terminates.

$$\frac{19}{20} = 0.95$$

But sometimes you get a repeating decimal.

$$\frac{210}{330} = 0.6363....$$

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A proportion is an equation showing 2 ratios are equal to each other

- Similar to reducing fractions

Example:

$$\frac{2}{3} = \frac{4}{6}$$

$$\frac{1}{2} = \frac{3}{6} = \frac{2}{4} = \frac{1}{2}$$

$$\frac{12}{24} = \frac{x}{48} = 24$$



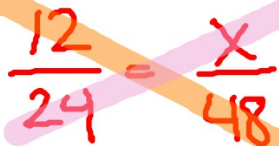
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How do we solve a situation like the following? There are a couple ways that we can look at solving this problem

$$\frac{12}{24} = \frac{x}{48}$$

cross multiplication


$$\frac{12}{24} = \frac{x}{48}$$

$$24 \cdot x = 12 \cdot 48$$

$$24x = 576$$

$$\frac{24x}{24} = \frac{576}{24}$$

$$x = 24$$

fish method


$$\frac{12}{24} = \frac{x}{48}$$

$$\frac{48 \cdot 12}{24} = x$$

$$\frac{576}{24} = x = 24$$

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$$\frac{9}{14} = \frac{5}{x}$$

Cross multiply

$$\frac{9}{14} \times \frac{5}{x}$$

$$= 9 \cdot x = 5 \cdot 14$$

$$\frac{9x}{9} = \frac{70}{9} \quad x = 7.78$$

fish method

$$\frac{5 \times 14}{9} = 7.78$$

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$$\frac{10}{4} = \frac{6}{r-9}$$

cross multiply

$$\frac{10}{4} = \frac{6}{r-9}$$

$$10(r-9) = 6 \cdot 4$$

$$10r - 90 = 24$$

$$+90 +90$$

$$\frac{10r}{10} = \frac{114}{10} \quad (r=11.4)$$

fish method

$$\frac{10}{4} \ominus \frac{6}{r-9}$$

$$\frac{6 \cdot 4}{10} = r - 9$$

$$\frac{24}{10} = r - 9$$

$$\frac{24}{10} = r - 9$$

$$r = 11.4$$

