

2.3 Proportions

proportion - an equation that states two ratios (or fractions) are equal.

$$\frac{a}{b} = \frac{c}{d} \quad \begin{array}{l} b \text{ \& c are the means} \\ a \text{ \& d are the extremes} \end{array}$$

cross multiply - the product of the means = product of the extremes

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

*** Must have an = !

Examples:

Solve:

1. $\frac{25}{x} = \frac{5}{2}$

$$5x = 25(2)$$

$$5x = 50$$

$$x = \frac{50}{5}$$

$$x = 10$$

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

$$3(4) = 6(2r)$$

$$12 = 12r$$

$$\frac{12}{12} = r$$

$$1 = r$$

$$\left. \begin{array}{l} 3(4) = 6(2r) \\ 12 = 12r \\ \frac{12}{12} = r \\ 1 = r \end{array} \right\} 2r(6) = 4(3)$$

3. $\frac{27}{u} = \frac{9}{u-6}$

$$9u = 27(u-6)$$

$$9u = 27u - 162$$

$$9u - 27u = -162$$

$$-18u = -162$$

$$u = \frac{-162}{-18}$$

$$u = 9$$

4. $\frac{12}{x-2} = \frac{32}{x+8}$

$$12(x+8) = 32(x-2)$$

$$12x + 96 = 32x - 64$$

$$96 = 32x - 12x - 64$$

$$96 = 20x - 64$$

$$96 + 64 = 20x$$

$$160 = 20x$$

$$\frac{160}{20} = x$$

$$8 = x$$

HOMEWORK

Worksheet - HW 2.3 Proportions