

5-1D: Solve Proportions

11-10-15

Proportion: an equation stating two rates or ratios are equal $\frac{8}{4} = \frac{2}{1}$

Cross Product: (heart method) method used for solving proportions
If $\frac{a}{b} = \frac{c}{d}$, then $ad = bc$.

Ex. 1: Solve each proportion.

A) $\frac{7}{14} = \frac{x}{12}$

$$12 \cdot 7 = 14x$$

$$84 = 14x$$

$$\frac{84}{14} = \frac{14x}{14}$$

$$6 = x \quad \boxed{x=6}$$

B) $\frac{16}{y} = \frac{4.8}{1.5}$

$$1.5 \cdot 16 = 4.8y$$

$$24 = 4.8y$$

$$\frac{24}{4.8} = \frac{4.8y}{4.8}$$

$$5 = y \quad \boxed{y=5}$$

C) $\frac{31}{x} = \frac{4}{3}$

$$3 \cdot 31 = 4x$$

$$93 = 4x$$

$$\frac{93}{4} = \frac{4x}{4}$$

$$23.25 = x \quad \boxed{x=23.25}$$

Ex. 2: Assume all situations are proportional.

A) Olivia mixed 5 oz of red paint with 3 oz of green paint. She decided to make 16 oz of the same mixture. Write and solve a proportion to find the number of ounces of red paint in the new mixture.

Original mixture: 5 oz red
3 oz green
8 oz mixture

Red Total $\frac{5}{8} = \frac{x}{16}$

$$16 \cdot 5 = 8x$$

$$80 = 8x$$

$$\frac{80}{8} = \frac{8x}{8}$$

$$x = 10 \text{ oz} \quad \boxed{x=10 \text{ oz}}$$

B) Haley bought 4 pounds of tomatoes for \$11.96. How much would she pay for 6 lbs? 10 lbs?

$\frac{\$11.96}{4 \text{ lbs}} = \frac{x}{6 \text{ lbs}}$

$$6 \cdot 11.96 = 4x$$

$$71.76 = 4x$$

$$\frac{71.76}{4} = \frac{4x}{4}$$

$$\$17.94 \text{ for } 6 \text{ lbs} \quad \boxed{\$17.94 \text{ for } 6 \text{ lbs}}$$

$\frac{\$11.96}{4 \text{ lbs}} = \frac{x}{10 \text{ lbs}}$

$$10 \cdot 11.96 = 4x$$

$$119.6 = 4x$$

$$\frac{119.6}{4} = \frac{4x}{4}$$

$$\$29.90 \text{ for } 10 \text{ lbs.} \quad \boxed{\$29.90 \text{ for } 10 \text{ lbs.}}$$

HW: GM 7 pg. 278 (1-15)