

# Lesson 5-3b

Objective - To use proportions to solve problems.

Proportion - A statement of equality between two ratios.

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

$$ad = bc$$

Solve for x.

$$1) \frac{3}{5} = \frac{x}{20}$$

$$\frac{60}{5} = \frac{5x}{5}$$

$$12 = x$$

$$2) \frac{5}{7} = \frac{30}{x}$$

$$\frac{5x}{5} = \frac{210}{5}$$

$$x = 42$$

Solve the proportions below.

$$1) \frac{5}{3} = \frac{n}{21}$$

$$\frac{105}{3} = \frac{3n}{3}$$

$$35 = n$$

$$3) \frac{5}{13} = \frac{15}{n}$$

$$\frac{5n}{5} = \frac{195}{5}$$

$$n = 39$$

$$2) \frac{3}{7} = \frac{12}{n}$$

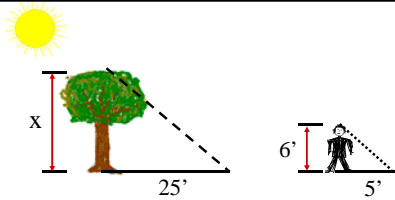
$$\frac{3n}{3} = \frac{84}{3}$$

$$n = 28$$

$$4) \frac{n}{10} = \frac{16}{2}$$

$$\frac{2n}{2} = \frac{160}{2}$$

$$n = 80$$



Correct Proportions

$$\frac{x}{25} = \frac{6}{5} \quad \frac{x}{6} = \frac{25}{5} \quad \frac{6}{5} = \frac{x}{25} \quad \frac{6}{x} = \frac{5}{25}$$

Incorrect Proportions

$$\frac{x}{6} = \frac{5}{25} \quad \frac{x}{5} = \frac{6}{25} \quad \frac{5}{6} = \frac{x}{25} \quad \frac{5}{x} = \frac{6}{25}$$

Proportions are similar to analogies.

$$\left( \frac{\text{Racket}}{\text{Tennis}} = \frac{x}{\text{Baseball}} \right)$$

$$\left( \frac{\text{Walk}}{\text{Run}} = \frac{\text{Talk}}{x} \right)$$

$$x = \text{Bat}$$

$$x = \text{Shout}$$

$$\left( \frac{\text{Milk}}{\text{Ice Cream}} = \frac{\text{Bread}}{x} \right)$$

$$x \neq \text{Flour}$$

$$x = \text{Sandwich}$$

If it takes 6 cups of flour to make 54 cookies, how many cookies can be made with 10 cups?

Let x = the number of cookies

$$\frac{\text{cups}}{\text{cookies}} \quad \frac{6}{54} = \frac{10}{x}$$

$$\frac{6x}{6} = \frac{540}{6}$$

$$x = 90 \text{ cookies}$$

A printer can print 91 books in 7 hours. How many books can it print in 12 hours?

Let x = the number of books

$$\frac{\text{books}}{\text{hours}} \quad \frac{91}{7} = \frac{x}{12}$$

$$91(12) = 7x$$

$$\frac{1092}{7} = \frac{7x}{7}$$

$$156 = x$$

$$x = 156 \text{ books}$$

## Lesson 5-3b (cont.)

A recipe for 20 rolls calls for 5 tablespoons of butter. How many tablespoons are needed for 30 rolls?

Let  $t$  = the # of tablespoons of butter

$$\frac{\text{tablespoons}}{\text{rolls}} \quad \frac{5}{20} \times \frac{t}{30}$$

$$5(30) = 20t$$

$$\frac{150}{20} = \frac{20t}{20}$$

$$7.5 = t \quad t = 7.5 \text{ tablespoons}$$