

Solving Proportions

How do we know if proportions are equivalent?

$$\frac{2 \cdot 1}{3 \cdot 2} = \frac{4}{6} \quad \frac{2 \cdot 2}{3 \cdot 2} = \frac{4}{6} \quad \frac{5 \cdot 3}{12 \cdot 3} = \frac{15}{36}$$

$12 = 12$

$$\frac{8}{10} = \frac{4}{5}$$

What do you notice about the **cross products** of each proportion?

To solve a proportion that contains a variable, you find the value that makes the equation true. Use the **cross products** to find the value of x.

$$\frac{6}{3} = \frac{x}{5} \quad \frac{6}{3} = \frac{10}{5}$$

$$\frac{3x}{3} = \frac{30}{3}$$

$x = 10$

$$\frac{x}{36} = \frac{21}{27}$$

$$\frac{756}{27} = \frac{27x}{27}$$

$28 = x$
 $x = 28$

$$\frac{6}{13} = \frac{7.8}{x} \quad \frac{6x}{6} = \frac{101.4}{6} \quad x = 16.9$$

Solving Proportions Word Problems

If two pounds of meat will serve 5 people, how many pounds will be needed to serve 13 people?

$$\frac{2 \text{ lbs.}}{5 \text{ peeps}} = \frac{x \text{ lbs.}}{13 \text{ peeps}}$$

$$\frac{5x}{5} = \frac{26}{5} \quad x = 5.2 \text{ lbs.}$$

Mary has saved \$17.50 in the past 3 weeks. At this rate, how much will she save in 15 weeks?

$$\frac{17.50}{3} = \frac{x}{15}$$

$$\frac{3x}{3} = \frac{262.50}{3}$$

$x = \$87.50$

A crew of loggers cleared 1/2 acre of lumber in 4 days. How long will it take the same crew to clear 2 3/4 acres of lumber?

$$\frac{1/2}{4} = \frac{2 3/4}{x}$$

$$\frac{1/2}{4} x = 11 \cdot \frac{2}{4}$$

$x = 22 \text{ days}$

A recipe calls for 2 1/2 cups of flour to make 2 dozen cookies. How many cups of flour would be required to bake 15 dozen cookies?

$$\frac{2}{2\frac{1}{2}} = \frac{15}{x}$$

$$\frac{2}{\frac{5}{2}} \rightarrow \frac{15}{x} \quad \frac{5}{2} \cdot \frac{15}{1}$$

$$\frac{4}{5}x = \frac{37.5}{2}$$

$$x = 18.75 \text{ cups of flour}$$

If a 6 ft. tall woman casts a 10 ft. long shadow, then how long is the shadow that a 9 ft tall giraffe casts?

$$\frac{6}{10} = \frac{9}{x}$$

$$\frac{6x}{6} = \frac{90}{6}$$

$$x = 15 \text{ ft}$$

Warm up 11/30

Kerry walks 3 miles each day.
How far will she walk in 7 days?