


Unit 20 Using Proportions

1. Cross multiplication can be used to find the missing term of a proportion.

A. The numbers of a proportion are called terms.

B. Example: Find the missing term in $\frac{1}{3} = \frac{4}{x}$.

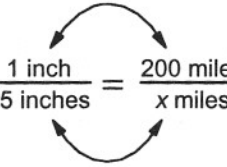
$$\frac{1}{3} = \frac{4}{x}$$


$$1x = (3)(4)$$

$$x = 12$$

2. Proportions can be used to solve some interesting problems.

A. The scale on a map uses 1 inch to represent 200 miles. How far apart are cities separated by 5 inches on this map?



$$\frac{1 \text{ inch}}{5 \text{ inches}} = \frac{200 \text{ miles}}{x \text{ miles}}$$

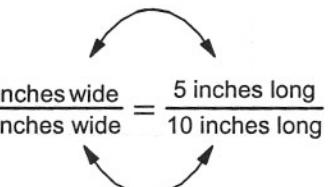
$$1x = (5)(200)$$

$$x = 1,000 \text{ miles}$$

Note: When setting up a proportion, each fraction will have the same measuring unit.

Here, $\frac{\text{inch}}{\text{inches}} = \frac{\text{miles}}{\text{miles}}$

B. A camera produces pictures that are 3 inches wide and 5 inches long. How wide is a 10-inch long enlargement?



$$\frac{3 \text{ inches wide}}{x \text{ inches wide}} = \frac{5 \text{ inches long}}{10 \text{ inches long}}$$

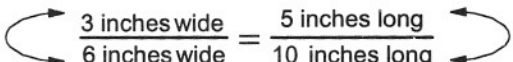
$$30 = 5x$$

$$x = 6 \text{ inches wide}$$

Note: If 5 x's are 30, then dividing 30 by 5 will give one x ($30/5 = 6$). See Unit 26 for further explanation.

Thought Question to Improve Understanding

Think about example B. The second print is twice as long as the first (10 is twice 5). Doesn't it make sense that the second print is twice as wide as the first (6 is twice 3)?



$$\frac{3 \text{ inches wide}}{6 \text{ inches wide}} = \frac{5 \text{ inches long}}{10 \text{ inches long}}$$