

Lesson 2-8

Example 1

Tell whether each statement is a proportion.

a. $\frac{5}{7} \stackrel{?}{=} \frac{15}{20}$

b. $4 : 9 \stackrel{?}{=} 24 : 54$

Solution

Find the cross-products.

a. $\frac{5}{7} \stackrel{?}{=} \frac{15}{20}$

$$5 \cdot 20 = 100$$

$$7 \cdot 15 = 105$$

$$100 \neq 105$$

No, the statement is not a proportion.

b. $\frac{4}{9} \stackrel{?}{=} \frac{24}{54}$

$$4 \cdot 54 = 216$$

$$9 \cdot 24 = 216$$

$$216 = 216$$

Yes, the statement is a proportion.

Example 2

Use mental math to complete each proportion.

a. $\frac{1}{6} = \frac{?}{42}$

b. $5 : 2 = ? : 8$

Solution

a. $1 \cdot 42 = 6 \cdot ?$ Write the cross-product.

$$42 = 6 \cdot ?$$
 What times 6 equals 42?

$$6 \cdot 7 = 42$$

$$\frac{1}{6} = \frac{7}{42}$$

b. $\frac{5}{2} = \frac{?}{8}$ Write ratios as fractions.

$$5 \cdot 8 = 2 \cdot ?$$
 Write the cross-product.

$$40 = 2 \cdot ?$$
 What times 2 equals 40?

$$20 \cdot 2 = 40$$

$$5 : 2 = 20 : 8$$

Example 3

HOBBIES The scale of this model sailboat is 1 in. : 15 ft. Find the actual length of the boat.

**Solution**

Write a proportion and complete by using mental math.

$$\frac{\text{model length (inches)}}{\text{boat length (feet)}} \rightarrow \frac{1}{15} = \frac{4}{?}$$

$$15 \cdot 4 = 1 \cdot ?$$

$$60 = 1 \cdot ?$$

$$60 = 1 \cdot 60$$

What number times 1 equals 60?

The actual length of the sailboat is 60 ft.

Example 4

CARTOGRAPHY The scale of miles on a road map is 1 in. : 22 mi. Find the map distance between two cities that are actually 154 mi apart.

Solution

$$\frac{\text{map distance (inches)}}{\text{actual distance (miles)}} \rightarrow \frac{1}{22} = \frac{?}{154}$$

$$154 = 22 \cdot ?$$

$$154 = 22 \cdot 7$$

The map distance is 7 in.