There are four ways to write this as a proportion.

Write the known ratio of men to women doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{12 \text{ men}}{5 \text{ women}} = \frac{600{,}000 \text{ men}}{x \text{ women}}$$

Write a ratio of men to men data. Complete the proportion with women to women data.

$$\frac{12 \text{ men}}{600{,}000 \text{ men}} = \frac{5 \text{ women}}{x \text{ women}}$$

Write the known ratio of women to men doctors. Complete the proportion with the ratio of actual numbers of doctors.

$$\frac{5 \text{ women}}{12 \text{ men}} = \frac{x \text{ women}}{600{,}000 \text{ men}}$$

Write a different ratio of men to men data. Complete the proportion with women to women data.

$$\frac{600{,}000 \text{ men}}{12 \text{ men}} = \frac{x \text{ women}}{5 \text{ women}}$$

Using what you know about equivalent ratios, you can find the number of women doctors from any one of these proportions. Finding the missing value in a proportion is called *solving the proportion*.

- Does one of the proportions seem easier to solve than the others?
- How many women doctors are there?

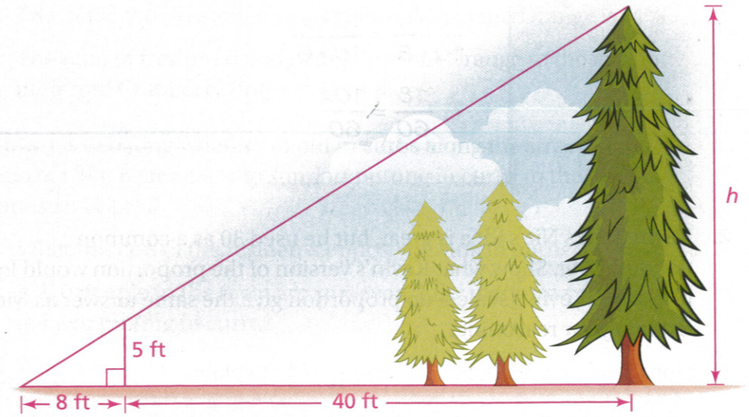
Problem 1.4

For each question, set up a proportion that shows the relationship between known and unknown quantities. Then use equivalent fractions, ratios, and scaling to solve each proportion.

A Imani gives vitamins to her dogs. The recommended dosage is 1 teaspoon per day for adult dogs weighing 10 pounds. She needs to give vitamins to Bruiser, who weighs 80 pounds and to Dust Ball, who weighs 7 pounds. What is the correct dosage for each dog?

B
1. Jogging 5 miles burns about 500 Calories. How many miles does Tanisha need to jog to burn off the 1,200-Calorie lunch she ate?
2. Tanisha jogs about 8 miles in 2 hours. How long will it take her to jog 12 miles?

C The triangles in this picture are similar. Find the height of the tree.



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Problem 1.4 continued

D Solve these proportions for the variable x. Use the reasoning you applied in Questions A through C.

1. $\frac{8}{5}=\frac{32}{x}$
2. $\frac{7}{12}=\frac{x}{9}$
3. $25:x=5:7$
4. $\frac{x}{3}=\frac{8}{9}$
5. $\frac{x}{5}=\frac{120}{3}$
6. $x:6=10:150$

E 1. Nic was working on the proportion below.

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

He could not see a way to scale 10 to make 6. Instead, he scaled both sides of the proportion. His work is shown below. How could Nic complete his solution?

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

$$\frac{3\cdot 6}{10\cdot 6}=\frac{10\cdot x}{10\cdot 6}$$

$$\frac{18}{60}=\frac{10x}{60}$$

2. Kevin thinks Nic's idea is great, but he used 30 as a common denominator. Show what Kevin's version of the proportion would look like. Does Kevin's scaled-up proportion give the same answer as Nic's? Explain your reasoning.
3. Does Kevin's work help you solve $\frac{7}{12}=\frac{x}{9}$? Explain.

ACE Homework starts on page 19.

ACE Applications | Connections | Extensions

Applications

1. In a comparison taste test of two juice drinks, 780 people preferred Cranberry Blast. Only 220 people preferred Melon Splash. Complete each statement.
   a. There were ■ more people who preferred Cranberry Blast.
   b. In the taste test, ■% of the people preferred Cranberry Blast.
   c. People who preferred Cranberry Blast outnumbered those who preferred Melon Splash by a ratio of ■ to ■.
2. In a taste test of new ice creams invented at Moo University, 750 freshmen preferred Cranberry Bog ice cream, while 1,250 freshmen preferred Coconut Orange ice cream. Complete each statement.
   a. The fraction of freshmen who preferred Cranberry Bog is ■.
   b. The percent of freshmen who preferred Coconut Orange is ■%.
   c. The ratio of freshmen preferring Coconut Orange to those who preferred Cranberry Bog was ■ to ■.
3. A town is debating whether to put in curbs along the streets. The ratio of town residents who support putting in curbs to those who oppose it is 2 to 5.
   a. What fraction of the residents oppose putting in curbs?
   b. If 210 people in the town are surveyed, how many do you expect to favor putting in curbs?
   c. What percent of the residents oppose putting in curbs?