

6-3 Scale Drawings and Models (Pages 276–280)

When objects are too small or too large to be drawn or constructed at actual size, people use a **scale drawing** or a **model**. The **scale** is the relationship between the measurements of the drawing or model to the measurements of the object. The scale can be written as a **scale factor**, which is the ratio of the length or size of the drawing or model to the length of the corresponding side or part on the actual object.

Examples

- a. The key on a map states that 1 inch is equal to 10 miles. Write the scale for the map.

$$\frac{1 \text{ inch}}{10 \text{ miles}} \quad \text{Write a fraction as } \frac{\text{inches}}{\text{miles}}.$$

- b. According to EXAMPLE A, how far apart would two cities be in actual distance if they were 5 inches apart on the map?

$$\frac{1}{10} = \frac{5}{x} \quad \text{Write a proportion using the scale.}$$

$$1 \cdot x = 5 \cdot 10 \quad \text{Use the property of proportions.}$$

$$x = 50 \text{ mi} \quad \text{Solve.}$$

Practice

On a set of blueprints for a new home, the contractor has established a scale that states $\frac{1}{2}$ inch = 10 feet. Use this information for problems 1–6.

- What is the actual length of the living room whose distance is 1 inch on the blueprints?
- What is the actual width of the living room whose distance is $\frac{3}{4}$ inch on the blueprints?
- What is the actual height of the living room whose distance is $\frac{9}{20}$ inch on the blueprints?
- If the buyer would like a kitchen to be 18 feet in length, how long should the kitchen be in the blueprints?
- What are the dimensions on the blueprints of a bedroom that will be 18 feet by 16 feet when the house is built?
- If the den has dimensions of 0.5 inch by 0.6 inch on the blueprints, what will be the dimensions of the actual den after the house is built?
- Standardized Test Practice** A model car has a scale of 1:24, where the model dimensions are in the numerator and the actual car dimensions are in the denominator. If the tires on the model have a diameter of $\frac{1}{2}$ inch, how long is the diameter of an actual tire on the car?
A 9 inches **B** 10 inches **C** 12 inches **D** 20 inches

Answers: 1. 20 feet 2. 15 feet 3. 9 feet 4. 0.9 inch 5. 0.9 inch by 0.8 inch 6. 10 feet by 12 feet 7. C