

Scale Drawings and Models (Pages 194–197)

A **scale drawing** or **scale model** is used to represent an object that is too large or too small to be drawn or built at actual size. The **scale** is the ratio of a length on the drawing or model to the corresponding length of the real object. For example, the length of a scale model is 1 foot and the length of the actual object is 5 feet. The scale is 1 foot = 5 feet or 1 : 5. If the scale uses the same units, it is not necessary to include them.

EXAMPLES

- A** The scale on a map of Colorado is 1 inch = 50 miles. Find the actual distance between Denver and Colorado Springs if the distance between them on the map is 1.4 inches.

Use the given scale and distance to write a proportion.

$$\frac{1 \text{ inch}}{50 \text{ miles}} = \frac{1.4 \text{ inches}}{x \text{ miles}} \quad \begin{array}{l} \leftarrow \text{map distance} \\ \leftarrow \text{actual distance} \end{array}$$

$$1x = 50(1.4) \quad \text{Find the cross products.}$$

$$x = 70$$

The distance between Denver and Colorado Springs is about 70 miles.

- B** A scale model of the creature in a movie is 19 inches high. If the creature in the movie is 76 inches tall, find the scale for the model.

Write the ratio of the height of the model to the height of the creature. Then solve a proportion in which the height of the model is 1 inch and the height of the creature is x inches.

$$\frac{19 \text{ inches}}{76 \text{ inches}} = \frac{1 \text{ inch}}{x \text{ inches}} \quad \begin{array}{l} \leftarrow \text{model height} \\ \leftarrow \text{actual height} \end{array}$$

$$19x = 76(1) \quad \text{Find the cross products.}$$

$$\frac{19x}{19} = \frac{76}{19} \quad \text{Divide each side by 19.}$$

$$x = 4$$

The scale is 1 inch = 4 inches or 1 : 4.

PRACTICE

On a map, the scale is 1 inch = 40 miles. Find the actual distance for each map distance.

	From	To	Map Distance
1.	Atlanta, GA	Greenville, SC	3.5 inches
2.	Kalamazoo, MI	Lansing, MI	2 inches
3.	Lincoln, NE	Sioux City, IA	$3\frac{3}{4}$ inches
4.	Tucson, AZ	Yuma, AZ	6 inches
5.	Akron, OH	Youngstown, OH	$1\frac{1}{4}$ inches
6.	White River Junction, VT	Newport, VT	2.5 inches

- 7. Geography** In a scale model of Mount St. Helens, the height of the volcano is 2 feet. If the actual height of the volcano is 8364 feet, find the scale of the model.



- 8. Standardized Test Practice** On the blueprint of a library, a book room is 4 inches long. The actual book room is 32 feet long. What is the scale of the blueprint?

A 8 : 1

B 1 : 8

C 1 : 96

D 96 : 1

Answers: 1. 1:40 mi 2. 80 mi 3. 150 mi 4. 240 mi 5. 50 mi 6. 100 mi 7. 1:4182 8. C