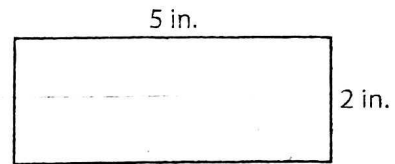


LESSON
8-1

Similar Shapes and Scale Drawings

Practice and Problem Solving: A/B

1. The plan of a terrace is shown at right. The scale is 2 inches : 6 feet. What are the length and width of the terrace? Find the terrace's area.

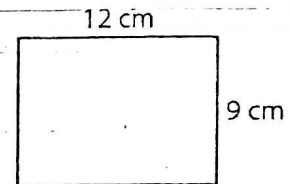


Length: _____

Width: _____

Area: _____

2. The floor plan of a ballroom is shown at right. The scale is 3 centimeters : 4 meters. What are the length and width of the ballroom? Find the ballroom's area.



Length: _____

Width: _____

Area: _____

3. A garage floor measures 150 feet by 120 feet. A scale drawing of the floor on grid paper uses a scale of 1 unit : 15 feet. What are the dimensions of the drawing?

4. The scale model of a skyscraper being built is 4.2 feet tall.

a. When it is finished, the skyscraper will be 525 meters tall. What scale was used to make the model?

b. The model is made out of a stack of plywood sheets. Each sheet is 0.6 inch thick. How many sheets of plywood tall is the model?

5. You have been asked to build a scale model of a restaurant out of bottle caps. The restaurant is 20 feet tall. Your scale is 2.4 cm : 1 foot.

a. A bottle cap is 1.2 cm tall. About how many bottle caps tall will your model be?

b. You are out of bottle caps, and decide to use popsicle sticks instead. You measure them, and they are 15.2 cm tall. How many popsicle sticks tall will your model be?

LESSON
8-1

Similar Shapes and Scale Drawings

Reteach

The dimensions of a scale model or scale drawing are related to the actual dimensions by a *scale factor*. The **scale factor** is a ratio.

The length of a model car is 9 in. $\longrightarrow \frac{9 \text{ in.}}{162 \text{ in.}} = \frac{9 \div 9}{162 \div 9} = \frac{1}{18}$

The length of the actual car is 162 in. $\longrightarrow \frac{9}{162}$ can be simplified to $\frac{1}{18}$. The scale factor is $\frac{1}{18}$.

If you know the scale factor, you can use a proportion to find the dimensions of an actual object or of a scale model or drawing.

- The scale factor of a model train set is $\frac{1}{87}$. A piece of track in the model train set is 8 in. long. What is the actual length of the track?

$$\frac{\text{model length}}{\text{actual length}} = \frac{8}{x} \quad \frac{8}{x} = \frac{1}{87} \quad x = 696$$

The actual length of track is 696 inches.

- The distance between 2 cities on a map is 4.5 centimeters. The map scale is 1 cm : 40 mi.

$$\frac{\text{distance on map}}{\text{actual distance}} = \frac{4.5 \text{ cm}}{x \text{ mi}} = \frac{1 \text{ cm}}{40 \text{ mi}} \quad \frac{4.5}{x} = \frac{1}{40} \quad x = 180$$

The actual distance is 180 miles.

Identify the scale factor.

- Photograph: height 3 in.
Painting: height 24 in.

$$\frac{\text{photo height}}{\text{painting height}} = \frac{\text{in.}}{\text{in.}} = \underline{\hspace{2cm}}$$

- Butterfly: wingspan 20 cm
Silk butterfly: wingspan 4 cm

$$\frac{\text{silk butterfly}}{\text{butterfly}} = \frac{\text{cm}}{\text{cm}} = \underline{\hspace{2cm}}$$

Solve.

- On a scale drawing, the scale factor is $\frac{1}{12}$. A plum tree is 7 inches tall on the scale drawing. What is the actual height of the tree?

- On a road map, the distance between 2 cities is 2.5 inches. The map scale is 1-inch:30 miles. What is the actual distance between the cities?