

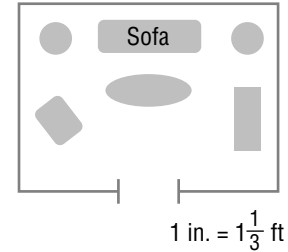
Study Guide and Intervention

7MG1.2

Scale Drawings and Models

Distances on a scale drawing or model are proportional to real-life distances. The **scale** is determined by the ratio of a given length on a drawing or model to its corresponding actual length.

Example 1 INTERIOR DESIGN A designer has made a scale drawing of a living room for one of her clients. The scale of the drawing is 1 inch = $1\frac{1}{3}$ feet. On the drawing, the sofa is 6 inches long. Find the actual length of the sofa.



Let x represent the actual length of the sofa. Write and solve a proportion.

$$\begin{array}{l} \text{Drawing Scale} \longrightarrow \downarrow \qquad \qquad \downarrow \text{Actual Length} \\ \text{drawing distance} \rightarrow \frac{1 \text{ in.}}{1\frac{1}{3} \text{ ft}} = \frac{6 \text{ in.}}{x \text{ ft}} \leftarrow \begin{array}{l} \text{drawing length} \\ \text{actual length} \end{array} \\ 1 \cdot x = 1\frac{1}{3} \cdot 6 \quad \text{Find the cross products.} \\ x = 8 \quad \text{Simplify.} \end{array}$$

The actual length of the sofa is 8 feet.

To find the scale factor for scale drawings and models, write the ratio given by the scale in simplest form.

Example 2 Find the scale factor for the drawing in Example 1.

Write the ratio of 1 inch to $1\frac{1}{3}$ feet in simplest form.

$$\frac{1 \text{ in.}}{1\frac{1}{3} \text{ ft}} = \frac{1 \cancel{\text{ in.}}}{16 \cancel{\text{ in.}}} \quad \text{Convert } 1\frac{1}{3} \text{ feet to inches.}$$

The scale factor is $\frac{1}{16}$ or 1:16. This means that each distance on the drawing is $\frac{1}{16}$ the actual distance.

Exercises

LANDSCAPING Yutaka has made a scale drawing of his yard. The scale of the drawing is 1 centimeter = 0.5 meter.

- The length of the patio is 4.5 centimeters in the drawing. Find the actual length.
- The actual distance between the water faucet and the pear tree is 11.2 meters. Find the corresponding distance on the drawing.
- Find the scale factor for the drawing.

