

Geometry - Lesson 4 Homework practice

Scale Drawings

A **scale drawing** represents something that is too large or too small to be drawn or built at actual size. Similarly, a **scale model** can be used to represent something that is too large or built too small for an actual-size model. The **scale** gives the relationship between the drawing/model measure and the actual measure.

Example

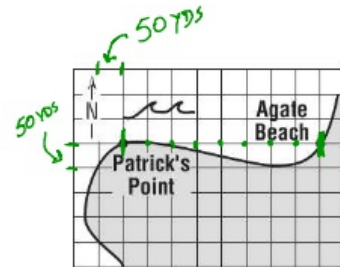
On this map, each grid unit represents 50 yards. Find the horizontal distance from Patrick's Point to Agate Beach.

Patrick's Point to Agate Beach

	Scale		Scale	
map →	1 unit	$\times 8$	8 units	← map
actual →	50 yards	$\times 8$	x yards	← actual

$1 \times x = 50 \times 8$ Cross products

$x = 400$ Simplify.



It is 400 yards from Patrick's Point to Agate Beach.

$$\textcircled{1} \frac{1 \text{ cm}}{20 \text{ mi}} = \frac{6.35 \text{ cm}}{127}$$

Exercises

Find the actual distance between each pair of cities. Round to the nearest tenth if necessary.

$$20 \times 6.35 = 127$$

Cities	Map Distance	Scale	Actual Distance
1. Los Angeles and San Diego, CA	6.35 cm	1 cm = 20 mi	127 mi
2. Lexington and Louisville, KY	15.6 cm	1 cm = 5 mi	78 mi
3. Des Moines and Cedar Rapids, IA	16.27 cm	2 cm = 15 mi	16.27×15
4. Miami and Jacksonville, FL	11.73 cm	$\frac{1}{2}$ cm = 20 mi	

$$\textcircled{2} \begin{array}{r} 15.6 \\ \times 5 \\ \hline 78.0 \end{array}$$

Find the length of each object on the scale drawing with the given scale. Then find the scale factor.

$$1 \text{ ft} = 12 \text{ in} \quad 16(12) = 192 \text{ in}$$

$$\frac{\text{DRAWING}}{\text{ACTUAL}} = \frac{1 \text{ in}}{6 \text{ in}} \cdot \frac{32}{32} = \frac{32 \text{ in}}{192 \text{ in}}$$

SCALE DRAWING SIZE

$$\begin{array}{r} 32 \\ 6 \overline{) 192} \\ 18 \downarrow \\ \hline 12 \end{array}$$

5. an automobile 16 feet long; 1 inch:6 inches
SCALE FACTOR 1:6

6. a pond 85 feet across; 1 inch = 4 feet
SCALE FACTOR 1:48

$$\frac{1 \text{ in}}{4 \text{ ft}} \cdot \frac{12}{12} = \frac{1 \text{ in}}{48 \text{ in}}$$

$$85 \text{ ft} \div 48 = 1.77 \text{ ft}$$

7. a parking lot 200 meters wide; 1 centimeter:25 meters

8. a flag 5 feet wide; 2 inches = 1 foot

$$\frac{1.77 \text{ ft}}{85 \text{ ft}}$$

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Scale Drawings

ARCHITECTURE The scale on a set of architectural drawings for a house is $\frac{1}{2}$ inch = $1\frac{1}{2}$ feet. Find the length of each part of the house.

	Room	Drawing Length	Actual Length
1.	Living Room	5 inches	
2.	Dining Room	4 inches	
3.	Kitchen	$5\frac{1}{2}$ inches	
4.	Laundry Room	$3\frac{1}{4}$ inches	
5.	Basement	10 inches	
6.	Garage	$8\frac{1}{3}$ inches	

ARCHITECTURE As part of a city building refurbishment project, architects have constructed a scale model of several city buildings to present to the city commission for approval. The scale of the model is 1 inch = 9 feet.

- The courthouse is the tallest building in the city. If it is $7\frac{1}{2}$ inches tall in the model, how tall is the actual building?
- The city commission would like to install new flagpoles that are each 45 feet tall. How tall are the flagpoles in the model?
- In the model, two of the flagpoles are 4 inches apart. How far apart will they be when they are installed?
- The model includes a new park in the center of the city. If the dimensions of the park in the model are 9 inches by 17 inches, what are the actual dimensions of the park?
- Find the scale factor.