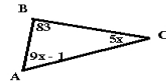


Scale Drawings

BELLWORK

Find the value of x .



Solve the proportion.

$$\frac{11}{x+2} = \frac{9}{x}$$

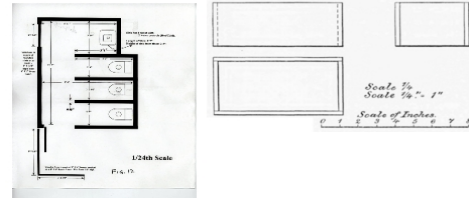
$$\frac{3x+7}{5} = \frac{4x}{6}$$

OBJECTIVE:

I can use proportions with scale drawings.

WARM-UP:

What is the scale of the drawings below? Why do you think one drawing has units and the other does not?



Scale Drawings

A map cannot be of the same size as the area it represents. So, the measurements are scaled down to make the map of a size that can be conveniently used by users such as motorists, cyclists and bushwalkers. A _____ of a building (or bridge) has the _____ as the real building (or bridge) that it represents but a _____ Builders use scaled drawings to make buildings and bridges. A ratio is used in scale drawings of maps and buildings.

A scale is usually expressed in one of two ways:

- using units as in _____
- without explicitly mentioning units as in _____

Example 14

Write the scale 1 cm to 1 m in ratio form.

$$\begin{aligned} \text{Solution:} \quad 1 \text{ cm to } 1 \text{ m} &= 1 \text{ cm} : 1 \text{ m} \\ &= 1 \text{ cm} : 100 \text{ cm} \\ &= 1 : 100 \end{aligned}$$

With a _____, we have no units listed, so we must convert meters to centimeters

CHECK:

Simplify the scale 5 mm : 1 m.

$$\frac{5 \text{ mm}}{1 \text{ m}}$$

Simplify the scale 5 cm : 2 km.

$$\frac{5 \text{ cm}}{2 \text{ km}}$$

USING A SCALE DRAWING:

On a map, the distance between two cities is 3 inches. What is the actual distance (in miles) between the two cities if the map's scale is 1 in. : 125 mi.?

Let x represent the actual distance in miles between the two cities. The ratio of the map distance between the two cities to the actual distance x is equal to the scale of the map. Write an solve a proportion using this relationship.

$$\frac{\text{Map distance}}{\text{Actual distance}} = \frac{\text{Map distance}}{\text{Actual distance}}$$

$$\frac{3 \text{ inches}}{x} = \frac{1 \text{ in.}}{125 \text{ mi.}}$$

$$x = 3(125)$$

$$x =$$

The actual distance is _____ miles.

CHECK:

On a map, the distance between two cities is 4 inches. What is the actual distance in miles between the two cities if the map's scale is 1 in : 80 mi.