

Get out your homework and have it ready to check. Warm Up on the problem below.

## Classwork - Scale Drawings

Warm Up: A blue print of a rectangular house has the dimensions of 6.25 inches by 10.5 inches. Use the scale 0.5 inches = 2 feet to find the dimensions of the actual house.

25 ft by 42 ft

$$\frac{0.5 \text{ in}}{2 \text{ ft}} = \frac{6.25 \text{ in}}{w}$$

$$\frac{0.5w}{0.5} = \frac{12.5}{0.5}$$

$$w = 25 \text{ ft}$$

$$\frac{0.5 \text{ in}}{2 \text{ ft}} = \frac{10.5 \text{ in}}{l}$$

$$\frac{0.5l}{0.5} = \frac{21}{0.5}$$

$$l = 42 \text{ ft}$$

1) You have a drawing of a boat that has a scale of 1.5 cm = 5 m. The length of the boat in the drawing is 2 cm long. What is the actual length of the boat?

$$\frac{1.5 \text{ cm}}{5 \text{ m}} = \frac{2 \text{ cm}}{x} \quad \frac{1.5x}{1.5} = \frac{10}{1.5}$$

$$x = 6.\bar{6} \text{ m}$$

2) Carson has a model Camaro that has a scale of 4.5 cm = 2 feet. If an actual Camaro has a length of 16 feet, what is the length of Carson's model?

$$\frac{4.5 \text{ cm}}{2 \text{ ft}} = \frac{x}{16 \text{ ft}} \quad \frac{2x}{2} = \frac{72}{2}$$

$$x = 36 \text{ cm}$$

3) A blueprint of a house has a scale of 1 in = 6 ft. The living room has dimensions of 18 ft by 24 feet. What are the dimensions on the blueprint of the living room? (HINT → You'll have two different proportions)

$$\frac{1 \text{ in}}{6 \text{ ft}} = \frac{x}{18 \text{ ft}}$$

$$x = 3 \text{ in}$$

$$\frac{1 \text{ in}}{6 \text{ ft}} = \frac{x}{24 \text{ ft}}$$

$$x = 4 \text{ in}$$

Model Dimensions  
3 in by 4 in

4) A model of a tree is made using a scale of 1 inch = 25 feet. What is the height of the actual tree if the height of the model is  $5\frac{5}{8}$  inches? What is the scale factor?

$$\frac{1 \text{ in}}{25 \text{ ft}} = \frac{5\frac{5}{8} \text{ in}}{x}$$

$$1x = 140\frac{5}{8} \text{ ft}$$

$$\frac{1 \text{ in}}{25 \text{ ft} \cdot 12} \rightarrow \frac{1 \text{ in}}{300 \text{ in}}$$

$$\text{Tree Height} = \underline{140\frac{5}{8} \text{ ft}}$$

$$\text{Scale Factor} = \underline{\frac{1}{300}}$$

Scale Example:  $2 \text{ cm} = 15 \text{ m}$  OR  $2 \text{ cm} : 15 \text{ m}$

Means  $\rightarrow$  Every 2 cm on one object is equivalent to 15 m on the other object.

Written as a Ratio  $\rightarrow \frac{2 \text{ cm}}{15 \text{ m}}$

Written as a Proportion  $\rightarrow \frac{2 \text{ cm}}{15 \text{ m}} = \frac{\text{cm}}{\text{m}}$

1) Use the scale  $1 \text{ cm} = 53 \text{ mi}$  and a ruler to find the distances between the following cities in Connecticut.  
SHOW WORK AND LABEL

A) What is the actual distance between Danbury and New Haven?

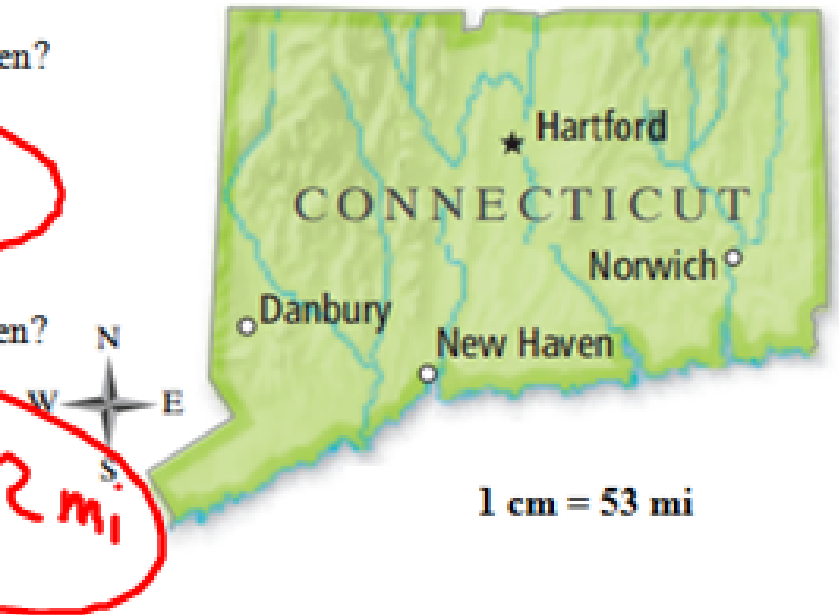
$$\frac{1 \text{ cm}}{53 \text{ mi}} = \frac{2 \text{ cm}}{a} \quad a = 106 \text{ mi}$$

B) What is the actual distance between Norwich and New Haven?

$$\frac{1 \text{ cm}}{53 \text{ mi}} = \frac{3.4 \text{ cm}}{b} \quad b = 180.2 \text{ mi}$$

C) What is the actual distance between Danbury and Norwich?

$$\frac{1 \text{ cm}}{53 \text{ mi}} = \frac{5.2 \text{ cm}}{c} \quad c = 275.6 \text{ mi}$$



2) Draw the scale drawing of the following real life objects, using the scale given in each problem.

A) The city's rectangular pool is 72 feet by 90 feet. Kerry is want to draw a scale drawing using the scale 1 cm = 12 feet. Construct the scale drawing of Hector's pool below. LABEL THE DIMENSIONS.

$$\frac{1 \text{ cm}}{12 \text{ ft}} = \frac{w}{72 \text{ ft}}$$

$$\frac{12w}{12} = \frac{72}{12}$$

$$w = 6 \text{ cm}$$

$$\frac{1 \text{ cm}}{12 \text{ ft}} = \frac{l}{90 \text{ ft}}$$

$$l = 7.5 \text{ cm}$$

6 cm by 7.5 cm



B) Mary is drawing a blue print of her house using the scale 2 cm = 8 ft. The size of her actual house is 28 feet by 36 feet. . Construct the scale drawing (blue print) of Mary's house below. LABEL THE DIMENSIONS

$$\frac{2 \text{ cm}}{8 \text{ ft}} = \frac{w}{28 \text{ ft}}$$

$$w = 7 \text{ cm}$$

$$\frac{2 \text{ cm}}{8 \text{ ft}} = \frac{l}{36 \text{ ft}}$$

$$l = 9 \text{ cm}$$

7 cm by 9 cm

3) Write a proportion to find the missing values of the following problems using the scale given.

A) A to scale replica of the Statue of Liberty has the scale of 0.5 cm = 10 ft. If the height of the replica is 15.3 cm, what is the actual height of the Statue of Liberty in real life?

$$\frac{0.5 \text{ cm}}{10 \text{ ft}} = \frac{15.3 \text{ cm}}{x} \quad x = 306 \text{ ft}$$

B) The scale on a map is  $\frac{1}{4}$  in : 18 mi. The state capital is 252 miles from the border. How far is the state capital from the border on the map?

$$\frac{\frac{1}{4} \text{ in}}{18 \text{ mi}} = \frac{x}{252 \text{ mi}} \quad x = 3\frac{1}{2} \text{ inches}$$

4) Find the simplified scale going from the actual to model of the drawings in the following problems.

Example:  $\frac{\text{New}}{\text{Old}} \rightarrow \frac{\text{Model}}{\text{Actual}} \rightarrow \frac{4 \text{ cm}}{16 \text{ km}} = \frac{1 \text{ cm}}{4 \text{ km}}$  Every 1 cm is equivalent to 4 km.

A) A to scale model drawing of a park has a length of 8 centimeters. The actual length of the park is 48 feet long. What is the scale of the drawing? **Don't forget your units in the ratio for scale.**

$$\frac{8 \text{ cm} \div 8}{48 \text{ ft} \div 8} = \frac{1 \text{ cm}}{6 \text{ ft}}$$

B) A to scale model of a building has a height of 20 inches. The actual height of the building is 75 feet. What is the scale of the model? **Don't forget your units in the ratio for scale.**

$$\frac{20 \text{ in} \div 5}{75 \text{ ft} \div 5} = \frac{4 \text{ in}}{15 \text{ ft}} \text{ OR } \frac{1 \text{ in}}{3\frac{3}{4} \text{ ft}}$$