Lesson 7.5  Understanding Scale Drawings

Solve. Show your work.

1. Richard built a model of a ferris wheel. The model has a height of 18 inches. The actual ferris wheel has a height of 234 feet. What scale factor did Richard use for the model?

   \[ \text{sf}_{s \to L} = \frac{2808}{18} \left( \frac{156}{156} \right) \]

   \[ \text{sf}_{L \to s} = \frac{18}{2808} \Rightarrow \frac{1}{156} \]

2. On a blueprint, the height of a door is 3.5 inches. The actual height of the door is 7 feet. What is the scale on the blueprint?

   \[ 3.5 \times 12 = 42 \]

   \[ \text{1 in : 2 ft : } 1:24 \]

   OR

   \[
   \frac{1}{144} = \frac{x}{748.8} \\
   144x = 748.8 \\
   x = 5.2 \text{ in}
   \]

   no units same.
4. Timothy has a model of an armoured vehicle created using a scale of 1:72. If the length of the model is 3.3 inches, what is the actual length of the vehicle, in feet?

19.8 ft.

5. A road map uses a scale of 1 inch : 4 miles. If the distance on the map between two towns is 3.8 inches, what is the actual distance between these two towns?

\[ \frac{1}{4} = \frac{3.8}{x} \]

\[ x \times 4 = 15.2 \text{ mi.} \]
6. A map shows some cities in the northern part of the United States. The scale of the map is 1 inch : 125 miles.
   a) The actual distance between Chicago, IL and Pittsburgh, PA is 375 miles. Find the distance between the two cities on the map.

   \[ \text{3 in.} \]

   \[ \text{sf} = 125 \]

   \[ \text{sf} < 1 \]

   \[ \frac{3}{4} \]

   \[ \frac{4.5}{6} = \frac{4}{3} \]

   \[ \Rightarrow \frac{4}{3} \text{ reciprocal} = \frac{3}{4} \]

b) On the map, the distance between Washington DC and New York City is 1.5 inches. Find the actual distance between these two cities.

\[ \text{187.5 mi.} \]
8. The Truckee River is about 142 miles long. What is the length of this river on a map with a scale of 1 inch : 25 miles?

\[
\frac{1}{25} = \frac{x}{142}
\]

\[25x = 142\]

\[x = 5.68\text{ in.}\]
9. The scale of a map is 1 inch : 5 miles. If the length of Manila Creek Road on this map is 3.4 inches, find the actual length of the road.

17 mi.

10. Kim is looking at a map with a scale of 1 inch : 18 miles. If the actual area of a farm is 810 square miles, what is the area of the farm on the map?

\[
\frac{810}{324} = \frac{5}{2}
\]

\[sf^2 = 18^2 = 324\]
11. On a blueprint, the area of a basketball court is 58 square inches.
   a) If the scale on the blueprint is 1 inch : 9 feet, what is the actual area of the basketball court?
      \[ 4.698 \, \text{ft}^2 \]  
      \[ 58 \times 81 = \]  
      \[ 58 \times 81 = 4698 \, \text{ft}^2 \]  
      \[ 58 \times 81 = 4698 \, \text{ft}^2 \]
   b) If the length of the basketball court on the blueprint is 10.4 inches, what is the actual length of the basketball court?  
      \[ 10.4 \times 9 = 93.6 \, \text{ft} \]
   c) What is the actual width of the basketball court to the nearest foot?  
      \[ A = l \times w \]  
      \[ 4698 = 93.6 \times w \]  
      \[ \frac{4698}{93.6} = w \]  
      \[ w = 50.192 \ldots \]  
      \[ w = 50 \, \text{ft} \]