

Scale Factor

NAME Key

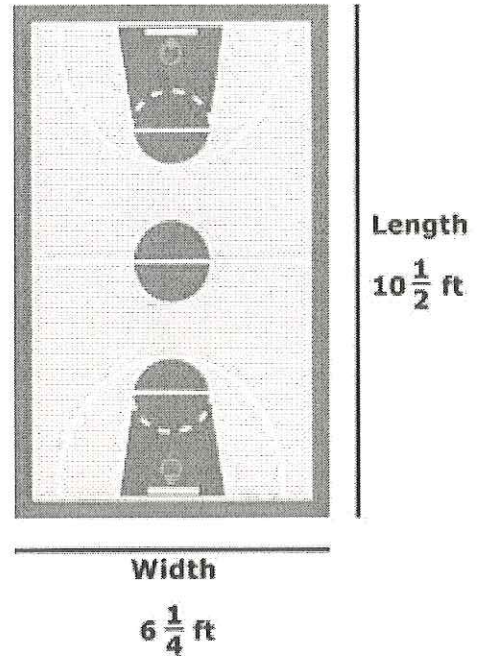
Scale factor is a way of describing the comparison between two similar figures.

For example saying that the scale factor applied to a figure is 2, is the same as saying that the scale is 2 to 1, $2 = 1$, or 2:1. The table below illustrates this idea...

Scale Factor	Other Ways to Illustrate the Scale Factor		
2	2 to 1	$2 = 1$	2:1
3	3 to 1	$3 = 1$	3:1
$\frac{1}{2}$	1 to 2	$1 = 2$	1:2

Apply this idea to the following questions and use the information to write a proportion and answer the question.

1. Before the basketball team starts practicing, the coach wants to prepare players by helping them understand the court they will be playing on. The coach has created a scaled picture of a court for the players. The image to the right is scaled by a factor of 8. Based upon the image, what would be the actual length and width of a basketball court, in feet?

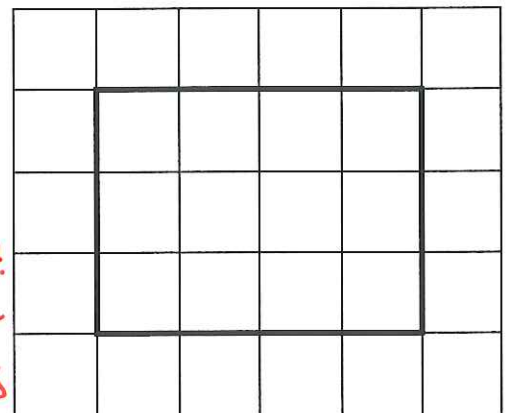


length
 Scale Act. $\frac{8}{1} = \frac{x}{10\frac{1}{2}}$ Pic
 $x = 84 \text{ ft}$

width
 Scale Act. $\frac{8}{1} = \frac{y}{6\frac{1}{4}}$ Pic
 $y = 50 \text{ ft}$

Length = 84 ft Width = 50 ft

2. A scale factor of 4 was applied to the figure below. What would be the new height and width of the **BOLDED** rectangle?

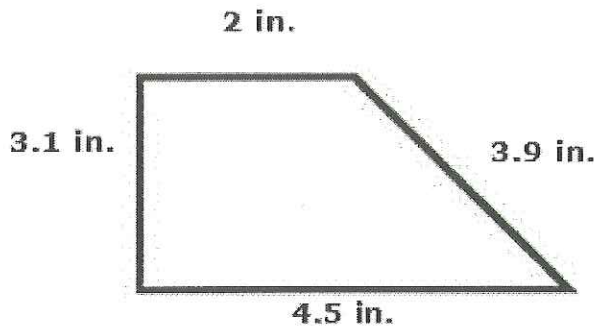


height
 Scale Act. $\frac{4}{1} = \frac{x}{3}$ Act
 $x = 12 \text{ units}$

width
 Scale Act. $\frac{4}{1} = \frac{y}{4}$ Act
 $y = 16 \text{ units}$

height is 12 units width is 16 units

3. Mr. Twain asked the students in his class to draw the figure below using a scale factor of 3. Then, he asked students to tell him one of the new side lengths of the figure. Some student responses are below...



Student	Response
Mark	5 in.
Samantha	6 in.
Divia	1.3 in.
Cheng	0.9 in.
Candice	11.7 in.

Which students answered Mr. Twain correctly?

Find all possible answers

$$\begin{array}{l|l} \text{Scale} \frac{\text{Act}}{\text{pic}} \frac{3}{1} = \frac{x}{3.1} \text{ pic} & \text{Scale} \frac{\text{Act}}{\text{pic}} \frac{3}{1} = \frac{y}{2} \text{ pic} \\ \hline x = 9.3 \text{ in} & y = 6 \text{ in} \end{array} \quad \begin{array}{l|l} \text{Scale} \frac{\text{Act}}{\text{pic}} \frac{3}{1} = \frac{z}{3.9} \text{ pic} & \text{Scale} \frac{\text{Act}}{\text{pic}} \frac{3}{1} = \frac{b}{4.5} \text{ pic} \\ \hline z = 11.7 \text{ in} & b = 13.5 \text{ in} \end{array}$$

The students that match up with the correct answers are Samantha and Candice.

4. Figure B is a scale image of figure A as shown. What scale factor was applied to figure A to produce figure B?

From Fig A to Fig B, the size got larger. So the scale factor has to be greater than 1.



Figure A

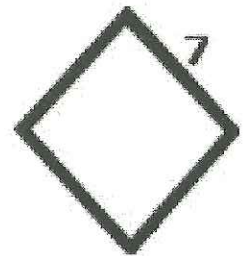


Figure B

What strategy did you use to figure this out?

I compared $\frac{\text{Fig B}}{\text{Fig A}} \rightarrow \frac{7}{2.5} = 2.8$

so the scale factor is 2.8