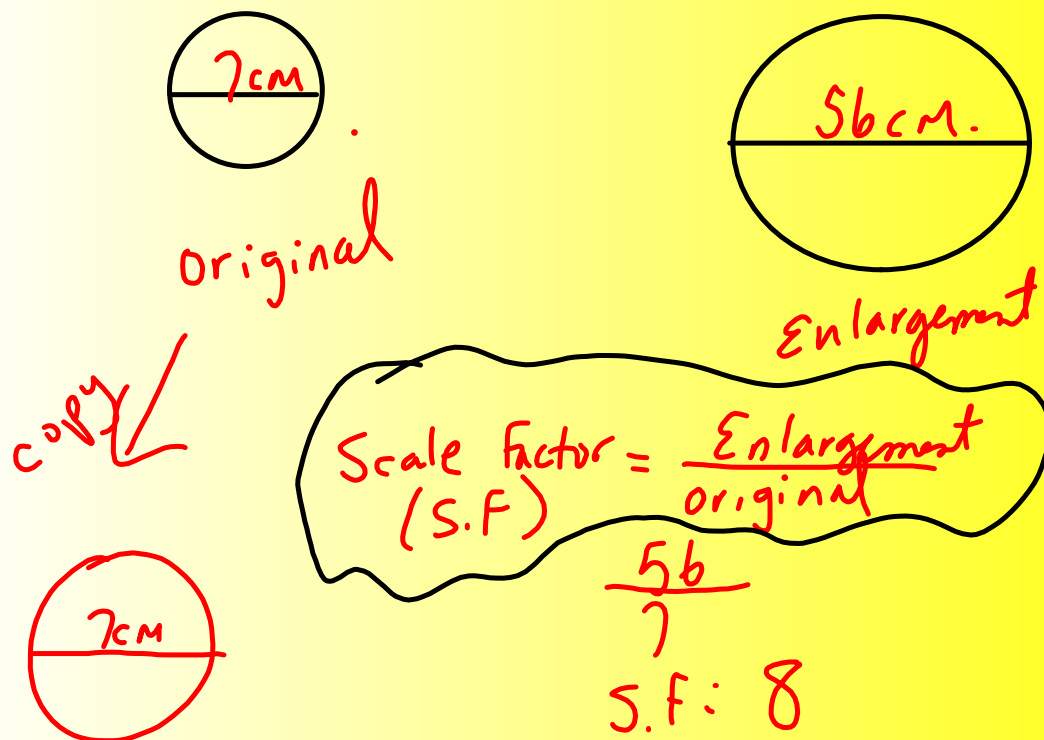


Warm-Up

April. 14/16

A. A circle has a diameter 7 cm. The diameter of the enlargement is 56 cm.

Determine the scale factor.



B. In a photo, the length of a model car is 4.4 cm. The photo is enlarged by a scale factor of 6.5.

Determine the length of the enlargement.

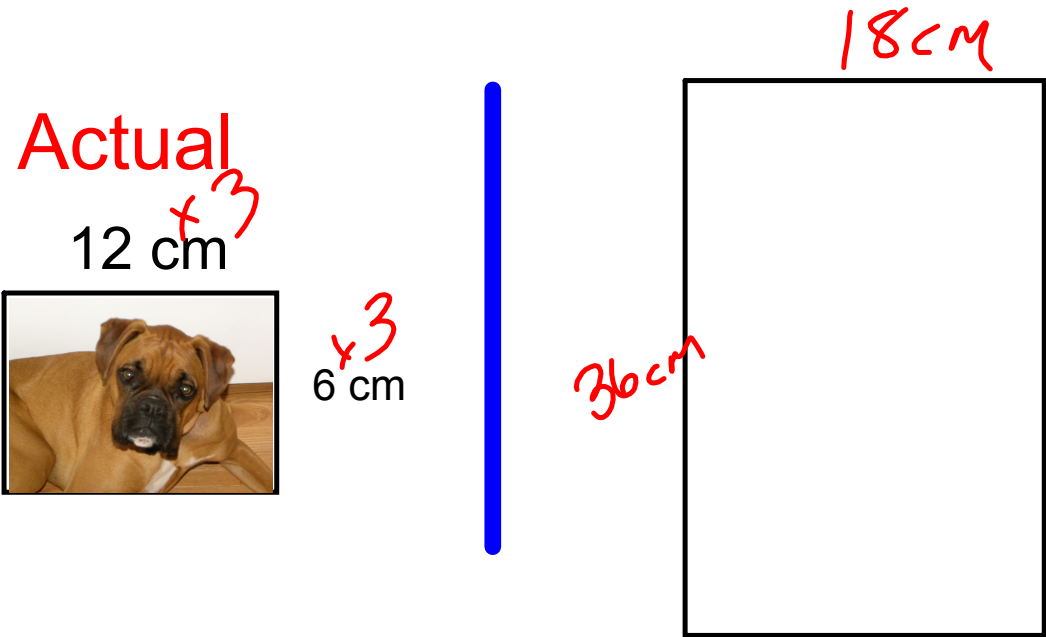


$\times 6.5$



$$\begin{aligned} \text{New length} &= \text{original} \times \text{S.F} \\ &= 4.4 \times 6.5 \\ &= 28.6 \text{ cm} \end{aligned}$$

Draw an enlargement with a scale factor 3



This photo of longhouses has dimensions 9 cm by 6 cm.

The photo is to be enlarged by a scale factor of $\frac{7}{2}$.

Calculate the dimensions of the enlargement.

$$\frac{7}{2} = 3.5$$



original

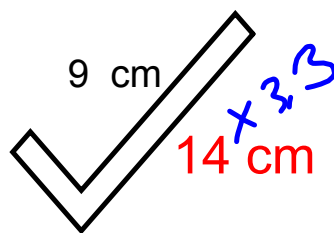
$$6\text{cm} \times 3.5$$

$$9\text{cm} \times 3.5$$

21cm Enlargement

$$31.5\text{cm}$$

- A. Find the scale factor in the following diagram.
- B. Find the unknown side.

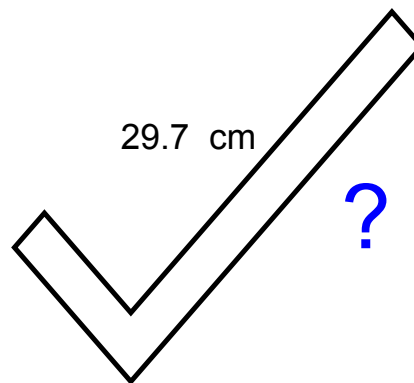


Original

$$S.F = \frac{\text{Enlargement}}{\text{original}}$$

$$\frac{29.7}{9}$$

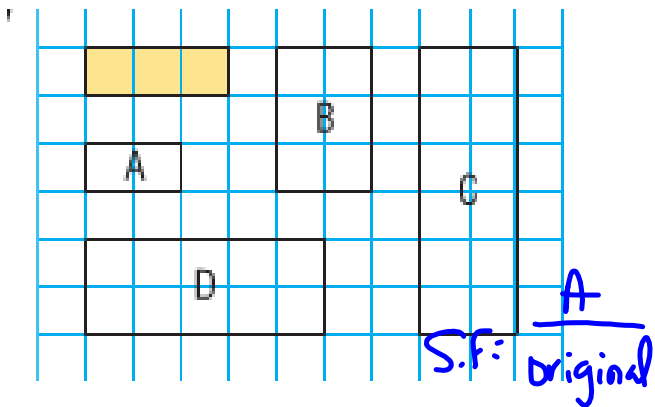
$$S.F = 3.3$$



$$\text{New length} = S.F \times \text{original}$$

$$= 3.3 \times 14$$

$$\therefore 46.2 \text{ cm}$$



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S.F. = $\frac{A}{\text{original}}$

S.F. = $\frac{B}{\text{original}}$

S.F. = $\frac{C}{\text{original}}$

S.F. = $\frac{D}{\text{original}}$

$\frac{2}{3} = 0.6$

$\frac{3}{3} = 1$

$\frac{6}{3} = 2$

$= \frac{5}{3}$

Long Side

Short Side

$\frac{1}{1} = 1$

$\frac{2}{1} = 2$

$\frac{2}{1} = 2$

$\frac{2}{1}$

NO

NO

yes

NO

Page 323

$$\text{Scale factor} = \frac{\text{Enlargement}}{\text{actual}}$$

#4

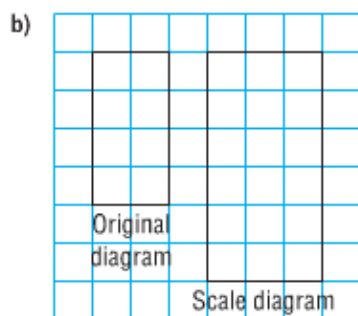
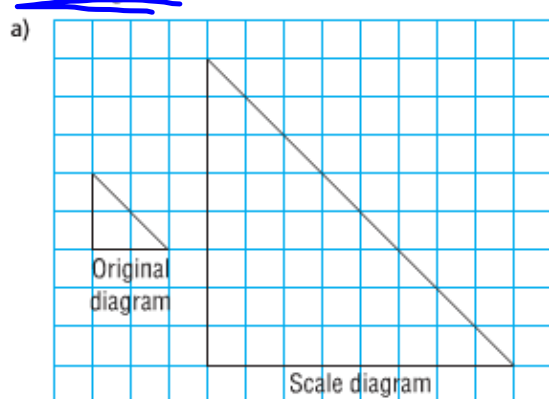
#5 [add a third column called "side length of scaled diagram"]

#6, 7, 8

Page 324 14 [draw to scale]

TEST SIGNED

4. Determine the scale factor for each scale diagram.

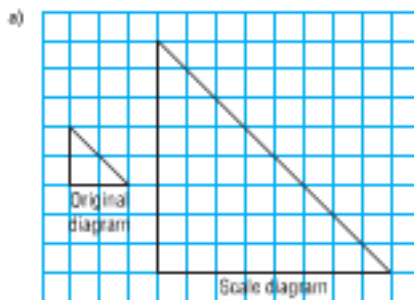


5. Scale diagrams of different squares are to be drawn. The side length of each original square and the scale factor are given. Determine the side length of each scale diagram.

	Side length of original square	Scale factor	<u>New length</u>
a)	12 cm	3	
b)	82 mm	$\frac{5}{2}$	
c)	1.55 cm	4.2	
d)	45 mm	3.8	
e)	0.8 cm	12.5	

Check

4. Determine the scale factor for each scale diagram.

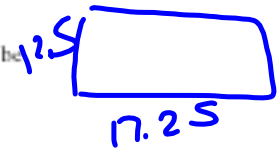


5. Scale diagrams of different squares are to be drawn. The side length of each original square and the scale factor are given. Determine the side length of each scale diagram.

	Side length of original square	Scale factor
a)	12 cm	3
b)	82 mm	$\frac{5}{2}$
c)	1.55 cm	4.2
d)	45 mm	3.8
e)	0.8 cm	12.5

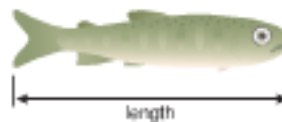
Apply

6. A photo of a surfboard has dimensions 17.5 cm by 12.5 cm. Enlargements are to be made with each scale factor below. Determine the dimensions of each enlargement. Round the answers to the nearest centimetre.

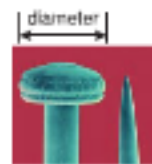


- a) scale factor 12
- b) scale factor 20
- c) scale factor $\frac{7}{2}$
- d) scale factor $\frac{17}{4}$

7. Here is a scale diagram of a salmon fry. The actual length of the salmon fry is 30 mm. Measure the length on the diagram to the nearest millimetre. Determine the scale factor for the scale diagram.



8. The head of a pin has diameter 2 mm. Determine the scale factor of this photo of the pinhead.

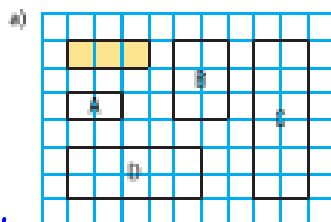


9. This view of the head of a bolt has the shape of a regular hexagon. Each angle is 120° . Use a protractor and ruler to draw a scale diagram of the bolt with scale factor 2.5.



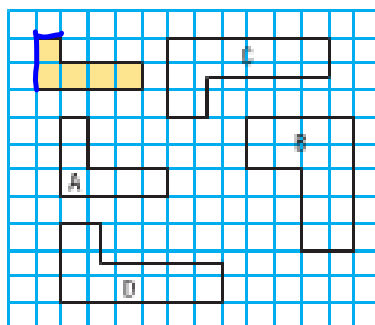
10. Draw your initials on 0.5-cm grid paper. Use different-sized grid paper to draw two different scale diagrams of your initials. For each scale diagram, state the scale factor.

11. **Assessment Focus** For each set of diagrams below, identify which of diagrams A, B, C, and D are scale diagrams of the shaded shape. For each scale diagram you identify:
- State the scale factor.
 - Explain how it is a scale diagram.



long

short

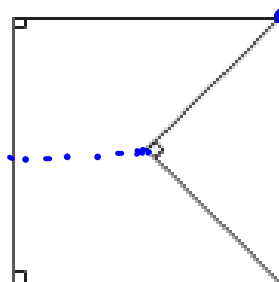


12. One frame of a film in a projector is about 50 mm high. The film is projected onto a giant screen. The image of the film frame is 16 m high.
- What is the scale factor of this enlargement?
 - A penguin is 35 mm high on the film. How high is the penguin on the screen?

Reflect

13. Look in a newspaper, magazine, or on the Internet. Find an example of a scale diagram that is an enlargement and has its scale factor given. What does the scale factor indicate about the original diagram or object?

14. Draw a scale diagram of the shape below with scale factor 2.5.



15. On a grid, draw $\triangle OAB$ with vertices $O(0, 0)$, $A(0, 3)$, and $B(4, 0)$.
- Draw a scale diagram of $\triangle OAB$ with scale factor 3 and one vertex at $C(3, 3)$. Write the coordinates of the new vertices.
 - Is there more than one answer for part a)? If your answer is no, explain why no other diagrams are possible. If your answer is yes, draw other possible scale diagrams.

Take It Further

16. One micron is one-millionth of a metre, or $1 \text{ m} = 10^6$ microns.
- A human hair is about 200 microns wide. How wide is a scale drawing of a human hair with scale factor 400? Give your answer in as many different units as you can.
 - A computer chip is about 4 microns wide. A scale diagram of a computer chip is 5 cm wide. What is the scale factor?

