Curriculum Outcomes:

(SS3) Demonstrate an understanding of similarity of polygons.

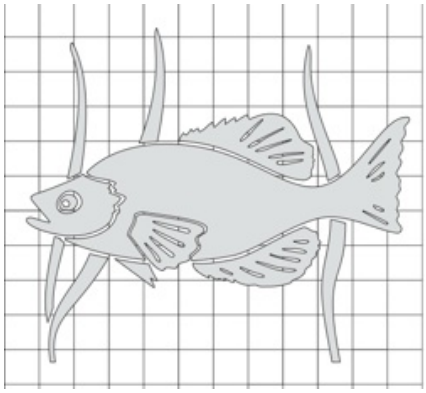
(SS4) Draw and interpret scale diagrams of 2-D shapes.

(SS5) Demonstrate an understanding of line and rotation symmetry.

Student Friendly:

How are diagrams related in size?

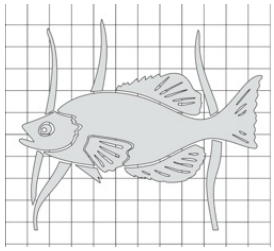
To determine how to enlarge or reduce diagram dimensions



Section 7.1 Enlargement

&

Section 7.2 Reductions



Scale Diagrams:

A diagram that is an enlargement or reduction of another diagram.

Enlargement: Make bigger

Reduction: Make smaller

The measurements in each diagram are compared.

Scale Factor = $\frac{\textit{Length of Scale Diagram}}{\textit{Length of Original Diagram}}$

$= \frac{\text{scale}}{\text{original}}$

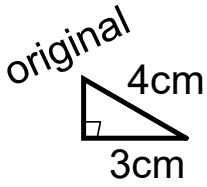
The scale factor can be written as a fraction or decimal.

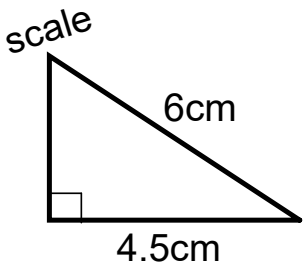
If the scale factor is less than one, the diagram is a reduction,

If the scale factor is larger than one the diagram is an enlargement.

When pairs of corresponding lengths have the same scale factor, we say that the

corresponding lengths are proportional.





Hypotenuse

$$\text{Scale factor} = \frac{\text{scale}}{\text{original}} = \frac{6}{4}$$

$$= 1.5$$

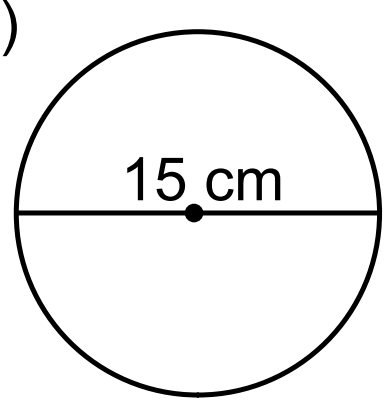
Leg

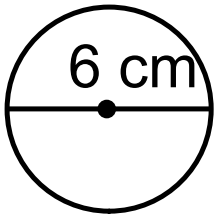
$$\text{Scale factor} = \frac{\text{scale}}{\text{original}} = \frac{4.5}{3}$$

$$= 1.5$$

Calculate the scale factor of the following

1)

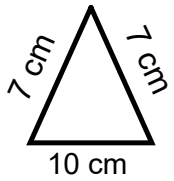


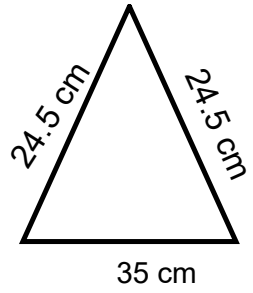


Scale factor = $\frac{\text{scale}}{\text{original}} = \frac{6}{15}$

$= 0.4$

2)





Pick corresponding sides from each triangle to compare

Scale factor = $\frac{\text{scale}}{\text{original}}$

$= \frac{24.5}{7}$

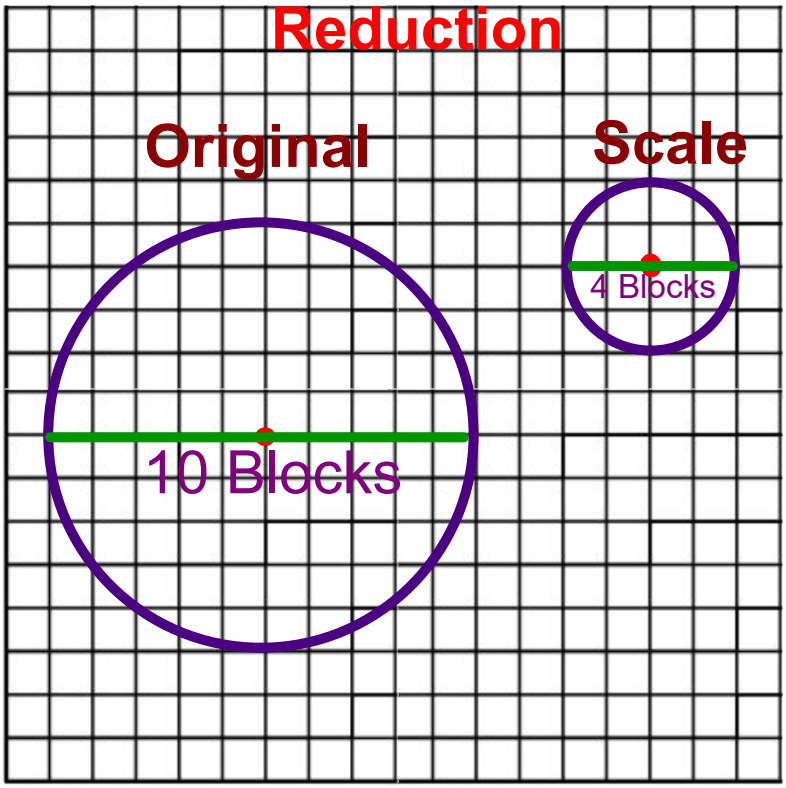
$= 3.5$

Scale factor = $\frac{\text{scale}}{\text{original}}$

$= \frac{35}{10}$

$= 3.5$

What is the scale factor of this reduction?



$$SF = \frac{\text{Scale}}{\text{Original}}$$

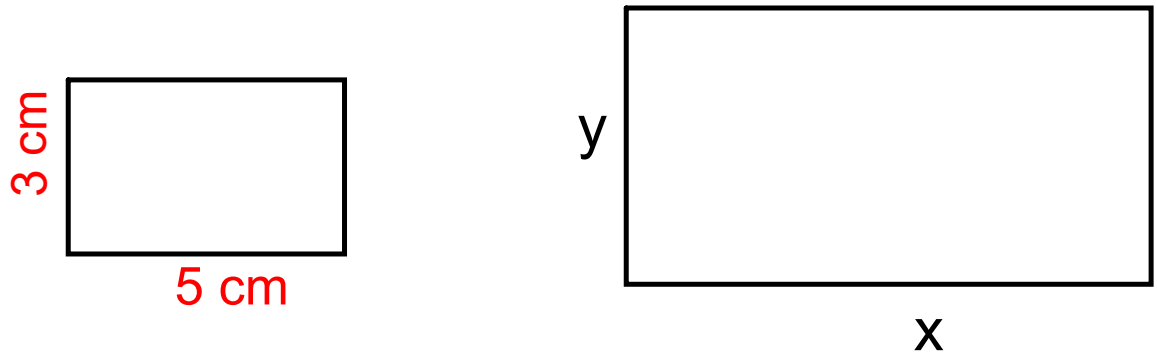
$$SF = \frac{4}{10}$$

$$SF = 0.4$$

SF=2

Ask yourself if this is an enlargement or a reduction*

Answer: Enlargement



When going from original to scale

(Original) x (Scale Factor)

x = (original) x (Scale Factor)

x= 5 cm x 2

x = 10 cm

y = (original) x (Scale Factor)

y= 3 cm x 2

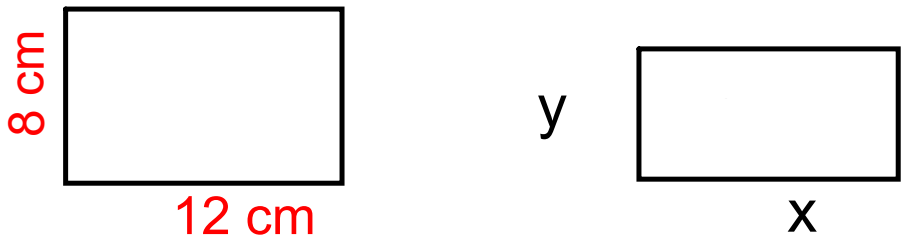
y = 6 cm

You Try this one

SF= $\frac{3}{4}$

Ask yourself if this is an enlargement or a reduction*

Answer: Reduction



When going from original to scale

(Original) x (Scale Factor)

x = (original) x (Scale Factor)

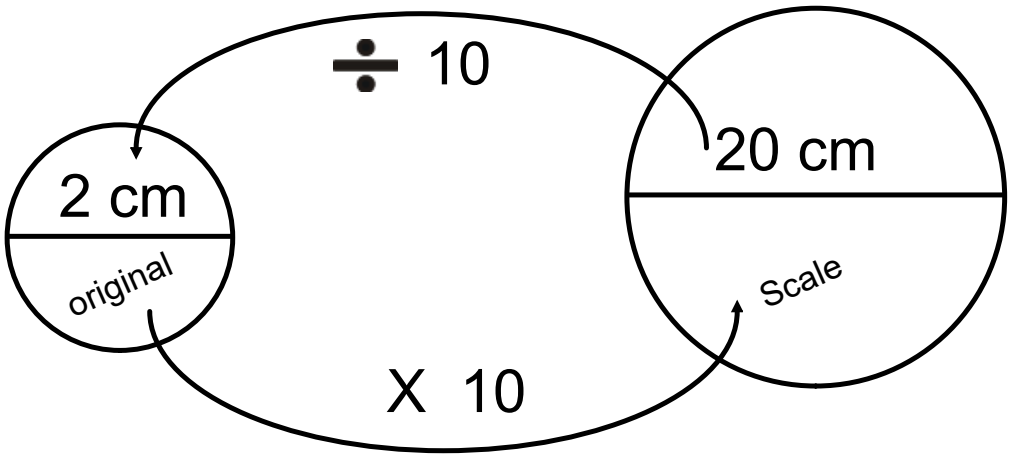
x= 12 cm x $\frac{3}{4}$

x = 9 cm

y = (original) x (Scale Factor)

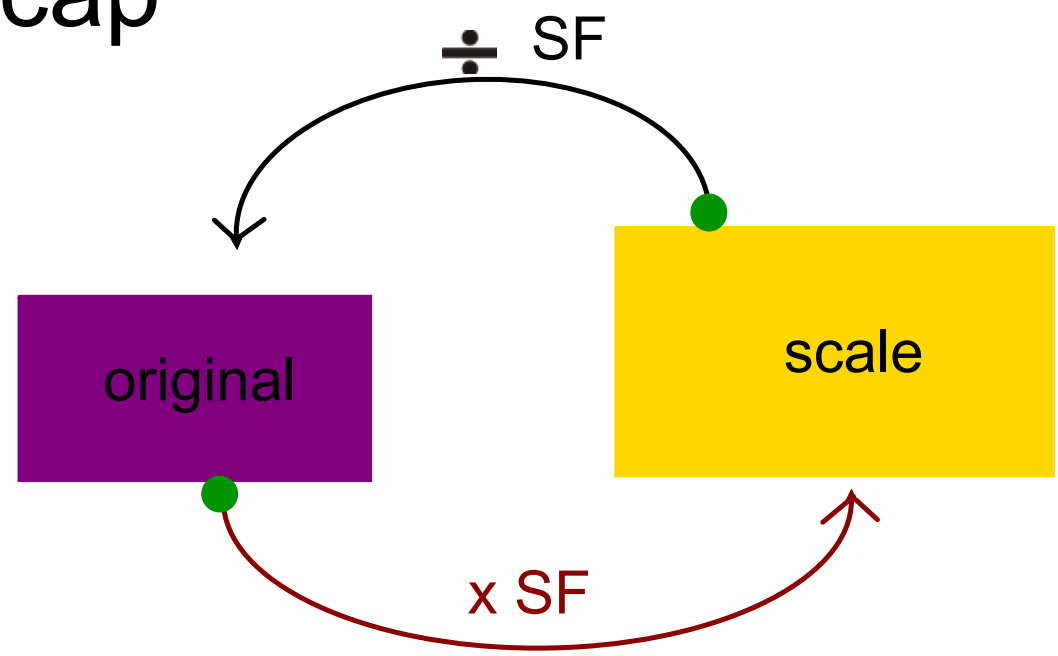
y= 8 cm x $\frac{3}{4}$

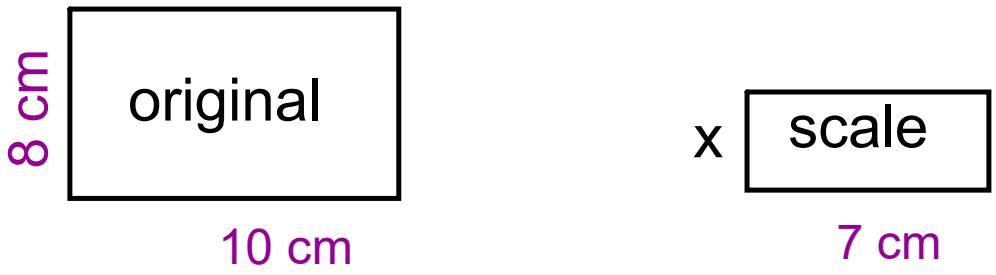
y = 6 cm



$$SF = \frac{\text{Scale}}{\text{Original}} = \frac{20}{2} = 10$$

Recap



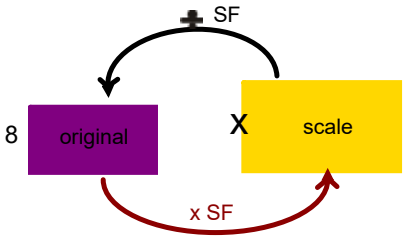


Step 1: Determine the scale factor

$$SF = \frac{\text{Scale}}{\text{Original}} = \frac{7 \text{ cm}}{10 \text{ cm}} = 0.7$$

Step 2: Determine if you are going from

original to scale or scale to original

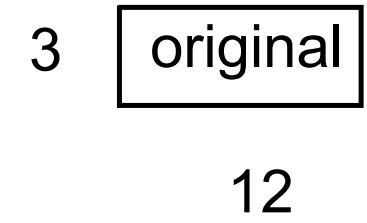


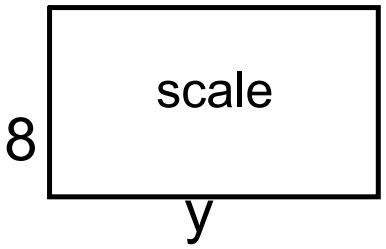
x = (original) x (SF)

x = 8 cm x (0.7)

x = 5.6 cm

You Try this one



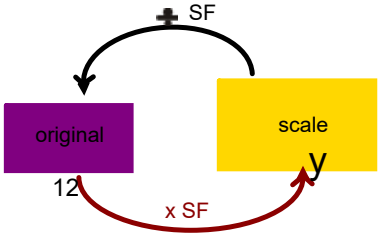


Step 1: Determine the scale factor

$$SF = \frac{\text{Scale}}{\text{Original}} = \frac{8\text{ cm}}{3\text{ cm}} = \frac{8}{3}$$

Step 2: Determine if you are going from

original to scale or scale to original

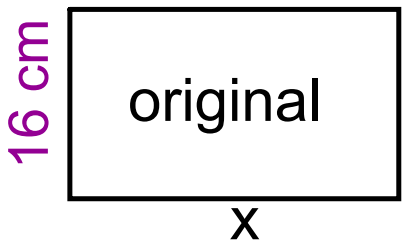


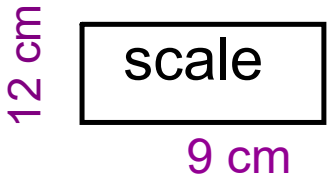
$y = (\text{original}) \times (SF)$

$y = 12\text{ cm} \times \frac{(8)}{(3)}$

$y = \frac{96}{3}\text{ cm}$

$y = 32\text{ cm}$



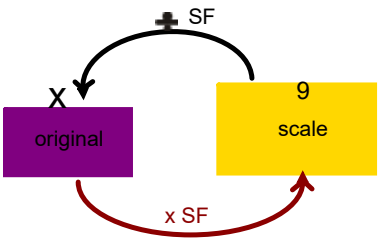


Step 1: Determine the scale factor

$$SF = \frac{\text{Scale}}{\text{Original}} = \frac{12 \text{ cm}}{16 \text{ cm}} = 0.75$$

Step 2: Determine if you are going from

original to scale or scale to original



x = (scale) ÷ (SF)

x = 9 cm ÷ (0.75)

x = 12 cm

Sometimes you are only given the scale diagram....

A scale may be given as a ratio.

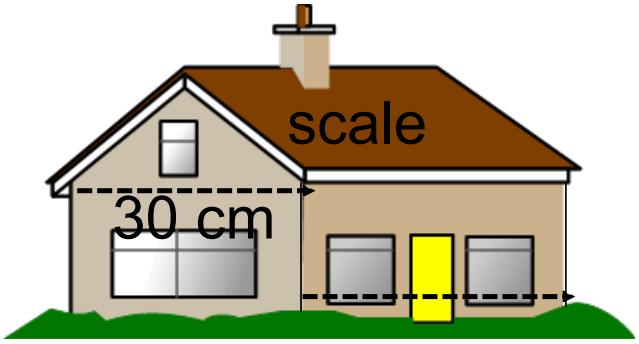
scale: original

The scale on this scale diagram of a house is 1:150.

This means that 1cm on the diagram represents 150 cm or 1.5m on the house.

In other words... the scale factor is $\frac{1}{150}$

How wide is the actual house??

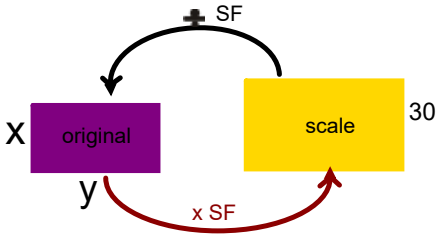


front

x = (scale) ÷ (SF)

x = 30 cm ÷ (1/150)

x = 4500 cm



Second method

scale : original

1 cm : 150 cm

x

30 cm : cm