

Part 3 – Reasoning and Problem Solving

WALT Calculate Scale Factors

This is following on from the work you did on Friday that introduced you to scale factors. *See my notes in green to help you.*

Problem Solving 1

A rectangle has been enlarged to create shape B. Using the clues below, identify which scale factor has been used.

Shape B has an area of 450cm^2 .

The width of the original rectangle is 12cm .

The perimeter of the original rectangle is 54cm .

Problem Solving 1

A rectangle has been enlarged to create shape B. Using the clues below, identify which scale factor has been used.

Shape B has an area of 450cm^2 .

The width of the original rectangle is 12cm. So we know that two of the sides measure 24cm in total.

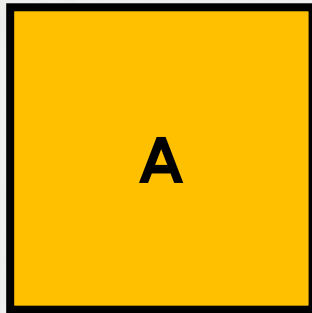
The perimeter of the original rectangle is 54cm.
So that means that the original length of the rectangle must have been 15cm. ($54 - 24 = 30$,
 $30 \div 2 = 15$.)

Scale factor of 2.5

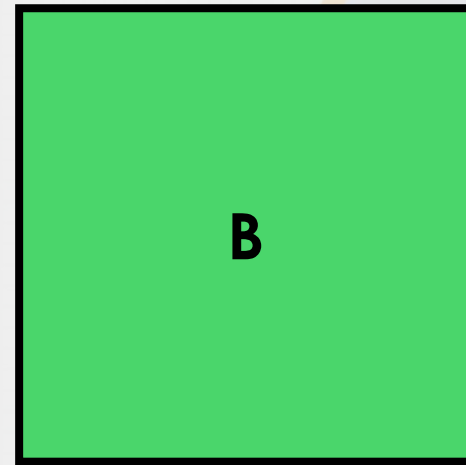
First work out the original dimensions (see notes above). Next work out the area of the original shape ($12 \times 15 = 180\text{cm}^2$). Finally, divide the area of the new shape by the area of the original shape to see how many times larger it is. $450 \div 180 = 2.5$ ~ therefore the shape has been enlarged by a scale factor of 2.5

Reasoning 1

Kayla has increased shape A to create shape B. She says if she created shape C using the same scale factor, one side would have a length of 8cm.



4cm



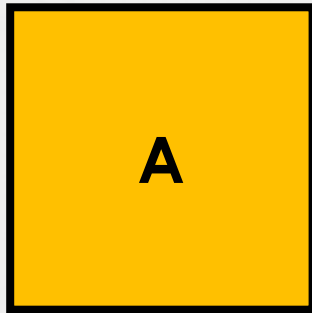
6cm

Do you agree? Explain your answer.

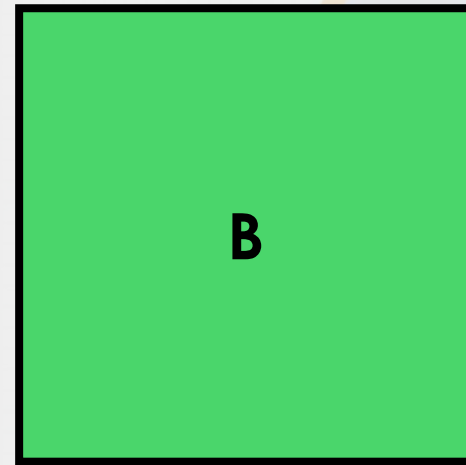
Not to scale

Reasoning 1

Kayla has increased shape A to create shape B. She says if she created shape C using the same scale factor, one side would have a length of 8cm.



4cm



6cm

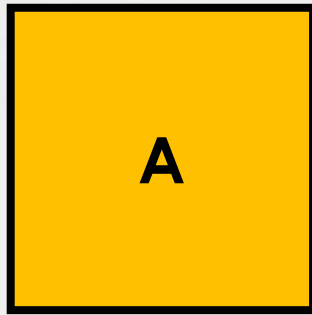
Do you agree? Explain your answer.

No because...

Not to scale

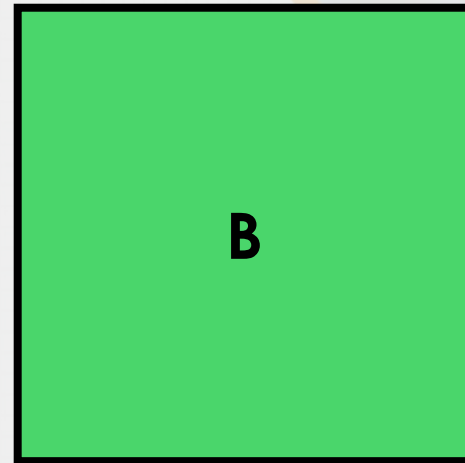
Reasoning 1

Kayla has increased shape A to create shape B. She says if she created shape C using the same scale factor, one side would have a length of 8cm.



4cm

Not to scale



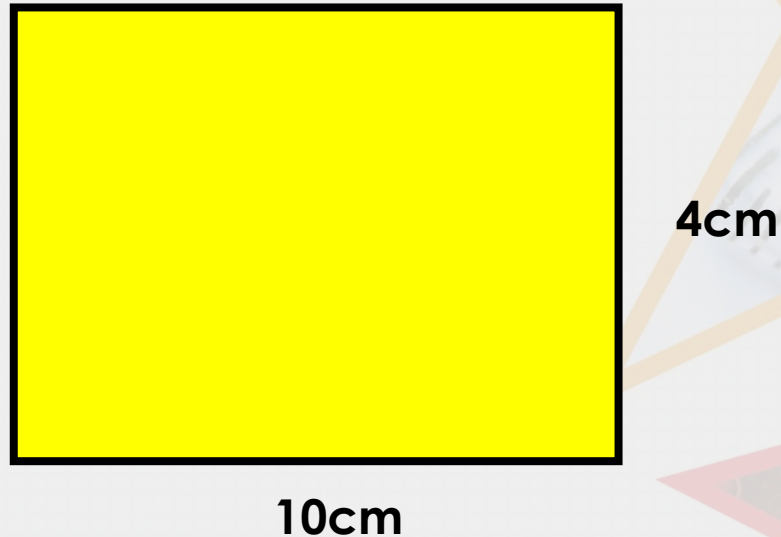
6cm

Do you agree? Explain your answer.

No because the scale factor used is 1.5. If she calculates 6×1.5 , she would have one side of the square as 9cm. You can calculate the scale factor by dividing the new shape length by the original shape length ($6 \div 4 = 1.5$) Then you do 6×1.5 to see if it matches the length Kayla said it would be for the 3rd shape.

Reasoning 2

When enlarged, the perimeter of the rectangle below increases to 70cm.

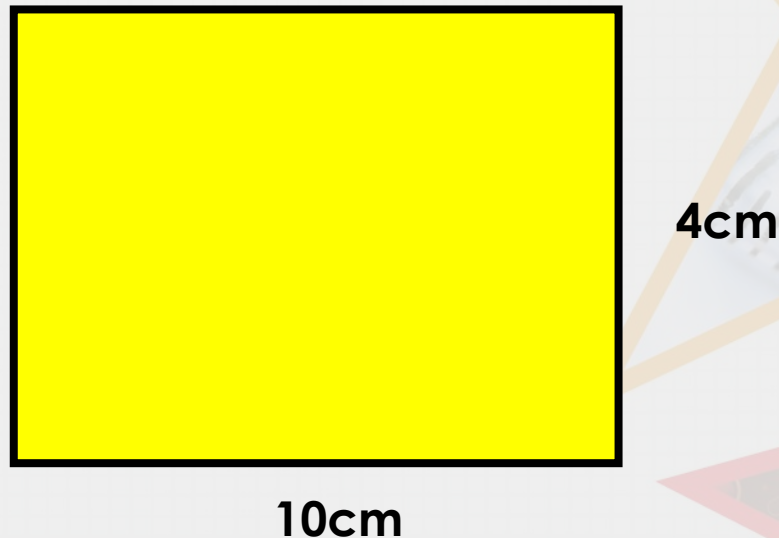


What scale factor has the shape been increased by?
Explain your answer.

Not to scale

Reasoning 2

When enlarged, the perimeter of the rectangle below increases to 70cm.



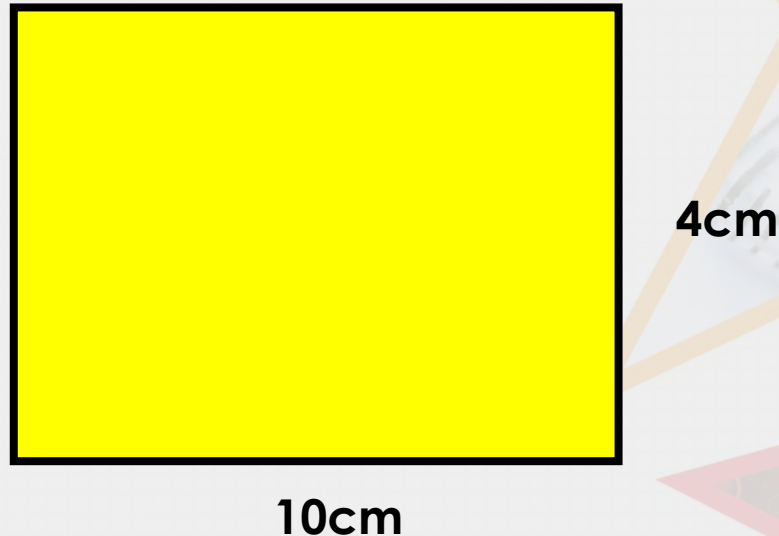
**What scale factor has the shape been increased by?
Explain your answer.**

The original perimeter of the shape is 28cm, so...

Not to scale

Reasoning 2

When enlarged, the perimeter of the rectangle below increases to 70cm.



What scale factor has the shape been increased by?
Explain your answer.

The original perimeter of the shape is 28cm, so the shape has been increased by a scale factor of 2.5. (because $28 \times 2.5 = 70\text{cm.}$)

Not to scale

Well done! It's over to you now.

Go to Part 4 and choose your Star Challenge! Normal rules apply: page 1 will give you an easier challenge, page 2 will be about the same as what we've just practised and page 3 will be more of a stretch.

You only need to do the first three questions on your chosen Star Challenge – the ones on the left-hand side. If you want extra practice, you can then do the three questions on the right hand side of your chosen challenge page. When you finish, don't forget to mark your answers before sharing, so I can see where you need help.