

## Use scale factors

### Notes and guidance

In this small step, children build on the previous step to enlarge shapes and describe enlargements.

Children need to know that one shape is an enlargement of another if all the matching sides are in the same ratio. They can use familiar language such as “3 times as big” before being introduced to the language of scale factors, for example “enlarged by a scale factor of 3”. They can then draw the result of an enlargement by a given scale factor. Children also identify the scale factor of an enlargement when presented with both images. Once confident with this, they can explore using inverse operations to find the dimensions of the original shape given the size of the enlargement.

### Things to look out for

- Children may not use the scale factor with all the dimensions of the shape.
- Children may use inaccurate measuring when working with shapes with diagonal lines rather than considering the vertical and horizontal distances.

### Key questions

- What does “scale factor” mean?
- How do you draw an enlargement of a shape?
- How can you work out the scale factor of enlargement between two shapes?
- If a shape has been enlarged by a scale factor of \_\_\_\_\_, how can you find the dimensions of the original shape?
- Do you need to multiply or divide to find the missing length? How do you know?

### Possible sentence stems

- \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_
- The shape is \_\_\_\_\_ times as big, so the scale factor of the enlargement is \_\_\_\_\_
- If a shape has been enlarged by a scale factor of \_\_\_\_\_, I need to \_\_\_\_\_ by \_\_\_\_\_ to find the original dimensions.

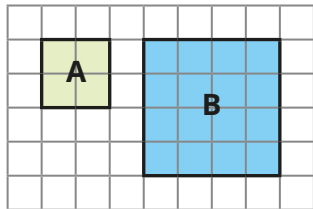
### National Curriculum links

- Solve problems involving similar shapes where the scale factor is known or can be found

# Use scale factors

## Key learning

- Mo draws a square twice as big as square A and labels it B.

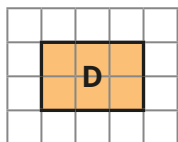


Square A  
has been enlarged  
by a scale factor  
of 2



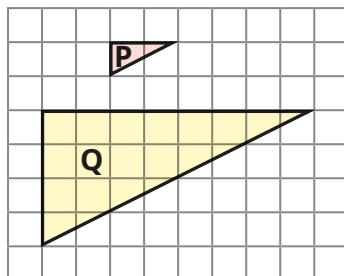
- ▶ Draw a square that is 3 times as big as square A. Label it C.
- ▶ What is the scale factor of enlargement from A to C?

- Use squared paper to complete the enlargements.

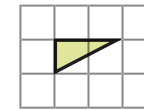


- ▶ Enlarge rectangle D by a scale factor of 2 and label it E.
- ▶ Enlarge rectangle D by a scale factor of 4 and label it F.

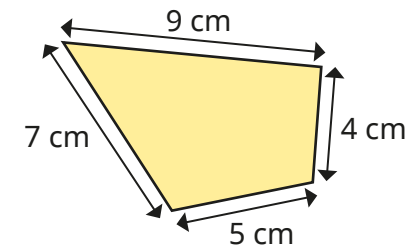
- What is the scale factor of enlargement from P to Q?



- On squared paper, enlarge the triangle by a scale factor of 3



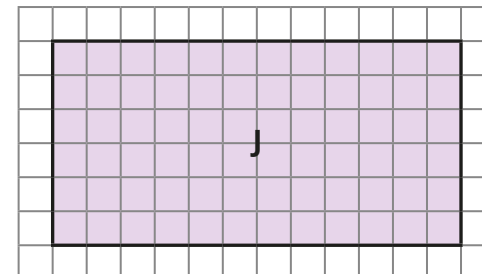
- Here is a quadrilateral.



The shape is enlarged by a scale factor of 7

What are the lengths of the sides of the enlarged shape?

- A shape is enlarged by a scale factor of 3  
Shape J is the result of the enlargement.

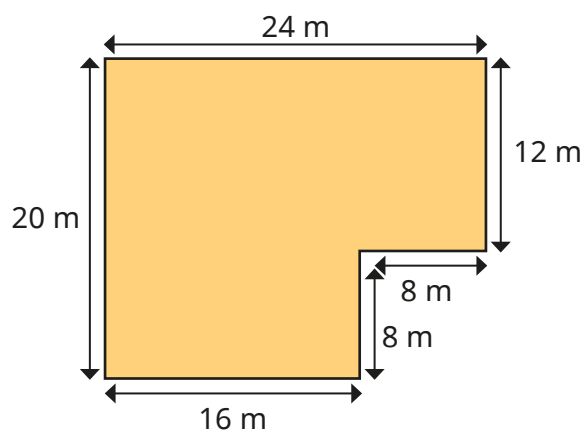


Draw the original shape.

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## Reasoning and problem solving

The shape is the result of an enlargement by a scale factor of 4



What is the perimeter of the enlarged shape?

What is the perimeter of the original shape?

What do you notice?

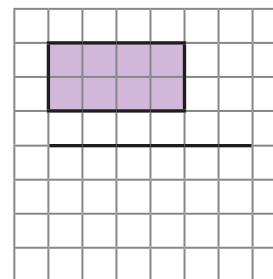
88 m

22 m

Kim is enlarging the shape by a scale factor of  $1\frac{1}{2}$

I know  $\frac{1}{2}$  of 4 is 2,  
so  $1\frac{1}{2}$  multiplied by 4 is 6  
The length of the rectangle is 6

Complete the enlargement.



On squared paper, enlarge the shape by a scale factor of  $2\frac{1}{2}$

On squared paper, enlarge the shape by a scale factor of  $1\frac{1}{4}$

side lengths 6 and 3

side lengths 10 and 5

side lengths 5 and  $2\frac{1}{2}$