Starter in Honour of St Andrews' Day

Answer

41700 Adult Tickets

Similar Figures

Today we are learning...

What similar figures are and how to identify them.

I will know if I have been successful if...

I understand what a similar figure is.

I can find the scale factor of the enlargement or reduction.

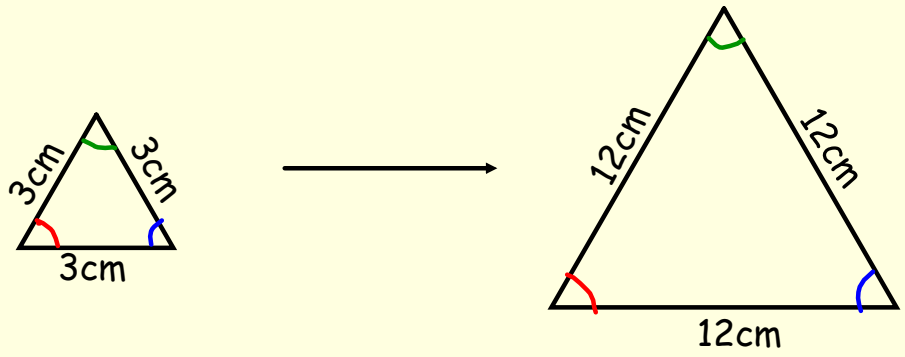
I know how to check if two figures are similar.

Similar Figures

Two shapes can be called similar if:

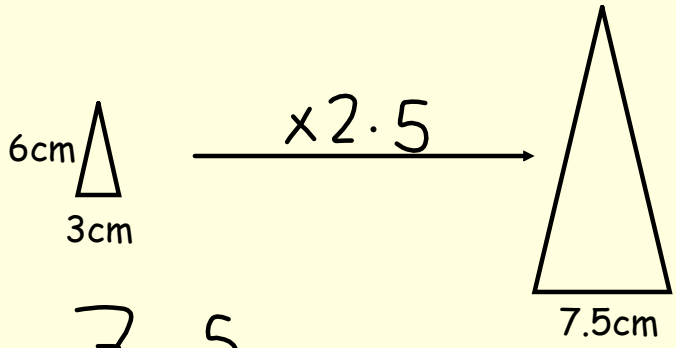
Their corresponding angles are equal.

Their corresponding sides are in the same ratio.



Scale Factor

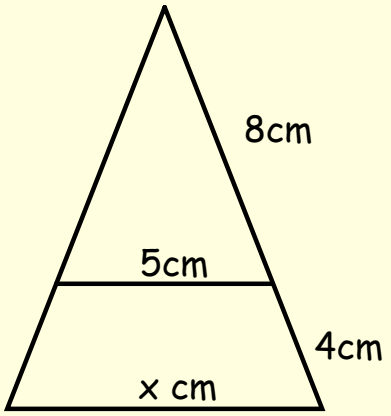
$$\text{Scale Factor} = \frac{\text{new}}{\text{old}}$$



$$SF = \frac{7.5}{3} = 2.5$$

Example 1

The two triangles are similar. Find the missing length x.



$$SF = \frac{new}{old}$$

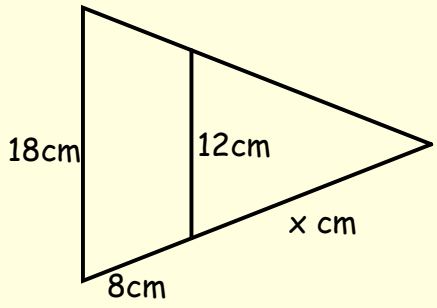
$$= \frac{12}{8} = \frac{3}{2} = 1.5$$

$$x = 5 \times 1.5$$

$$= 7.5\text{cm}$$

Example 2

The two triangles are similar. Find the missing length x.



$$SF = \frac{new}{old.}$$

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

$$\frac{3}{2}x = x + 8$$

$$3x = 2x + 16$$

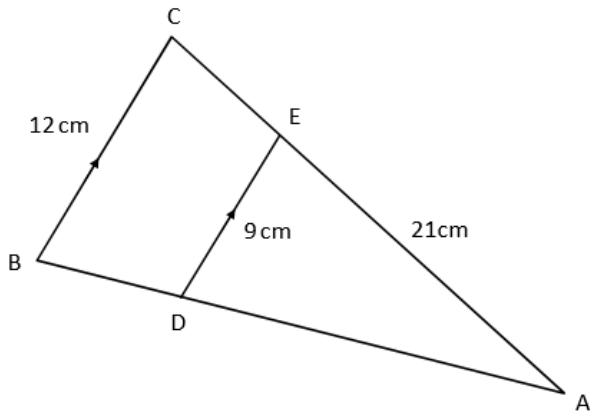
$$x = 16\text{cm}$$

National 5 WB 4th Dec Similarity

Starter

1) In the diagram below triangles ABC and ADE are **mathematically similar**.

BC = 12 cm, DE = 9 cm and AE = 21 cm.



Find the length of CE.

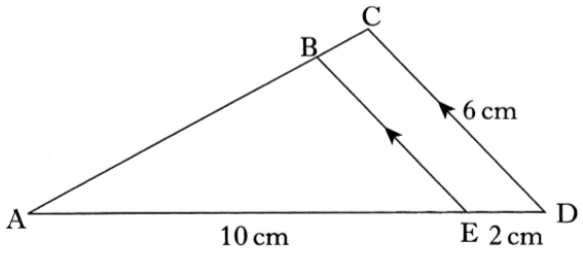
2) Find the discriminant of $y = 2x^2 + 5x - 9$

Example 1

Triangles ABE and ACD with some of their measurements are shown opposite.

Triangle ABE is similar to triangle ACD.
Calculate the length of BE.

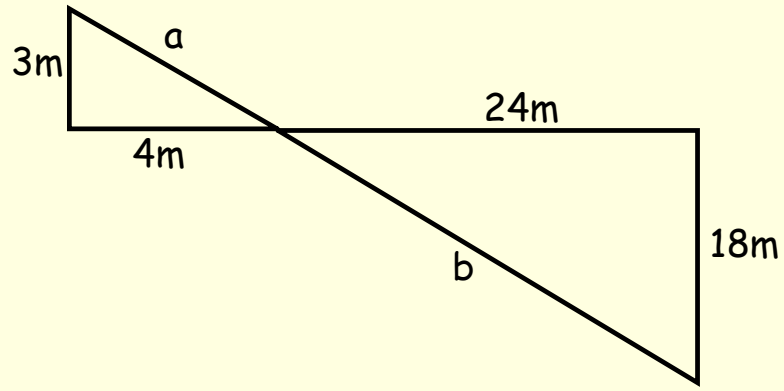
Do not use a scale drawing.



3 KU

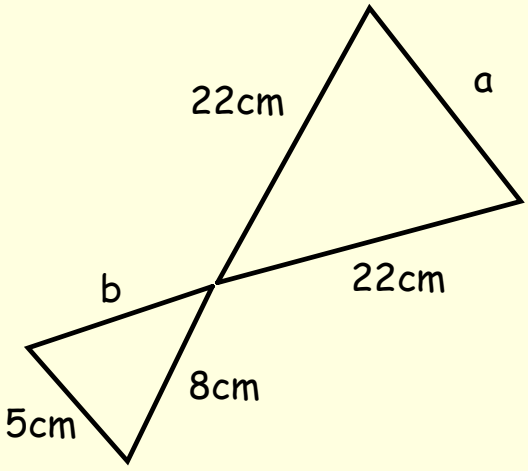
Example 2

The two triangles are similar. Find the missing lengths a and b.



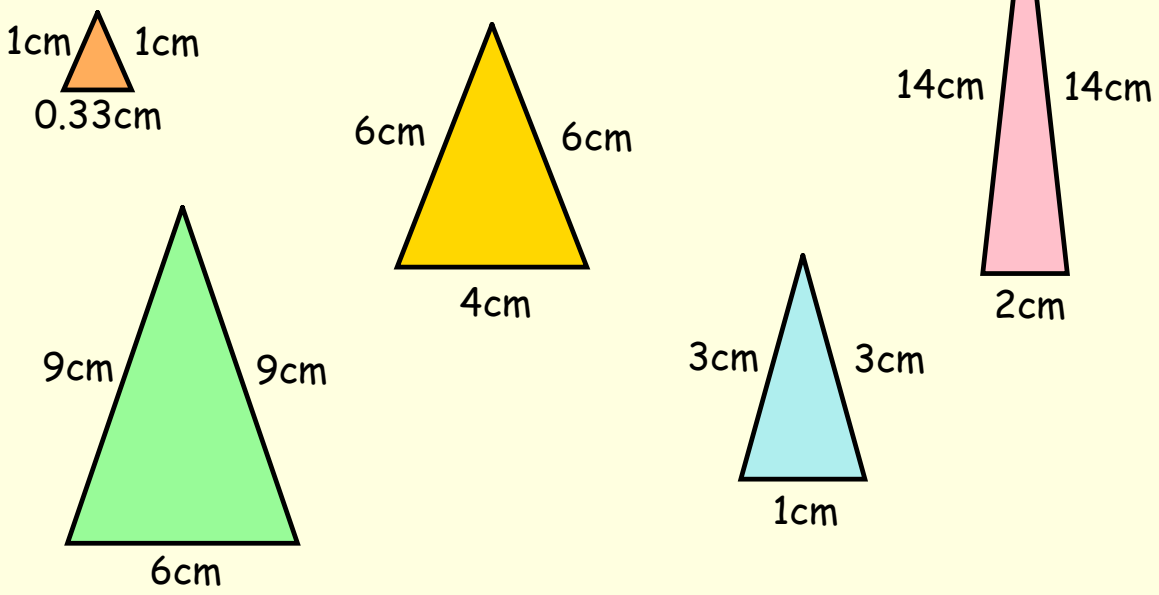
Example 3

The two triangles are similar. Find the missing lengths a and b.

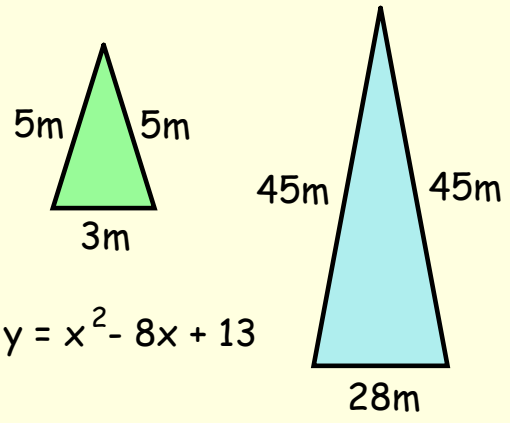


Plenary

Which shapes are mathematically similar?



Starter



1) Are these triangles similar?

No as 3 x 9 = 27 not 28

2) How many roots does the graph of $y = x^2 - 8x + 13$ have?

Discriminant = 13 > 0

Therefore 2 Roots.

3) What is the distance between the points (2, 5) and (-8, 13)?

$\sqrt{10^2 + 8^2} = \sqrt{164} \approx 12.9$

Surface Area and Volume Scale Factors

Today we are learning...

The relationship between area and volume scale factors.

I will know if I have been successful if...

I have conducted an investigation on surface area scale factors.

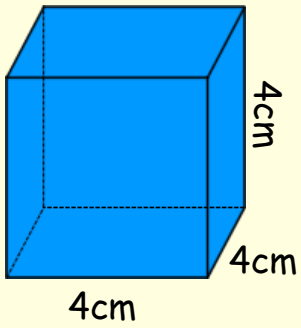
I have conducted an investigation on volume scale factors.

I have shared my findings with others in the class.

Surface Area and Volume

To find the surface area of a cube or cuboid...

$4 \times 4 \times 6 = 96\ cm^2$



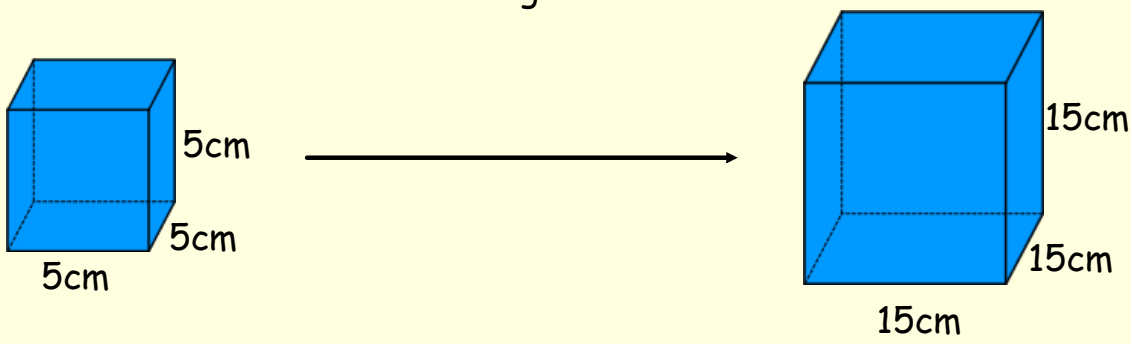
To find the volume of a cube or cuboid...

$4 \times 4 \times 4 = 64 cm^2$

Investigation

When we enlarge a 3D object by a given scale factor, does the volume and the surface area also increase by the same scale factor?

Investigation

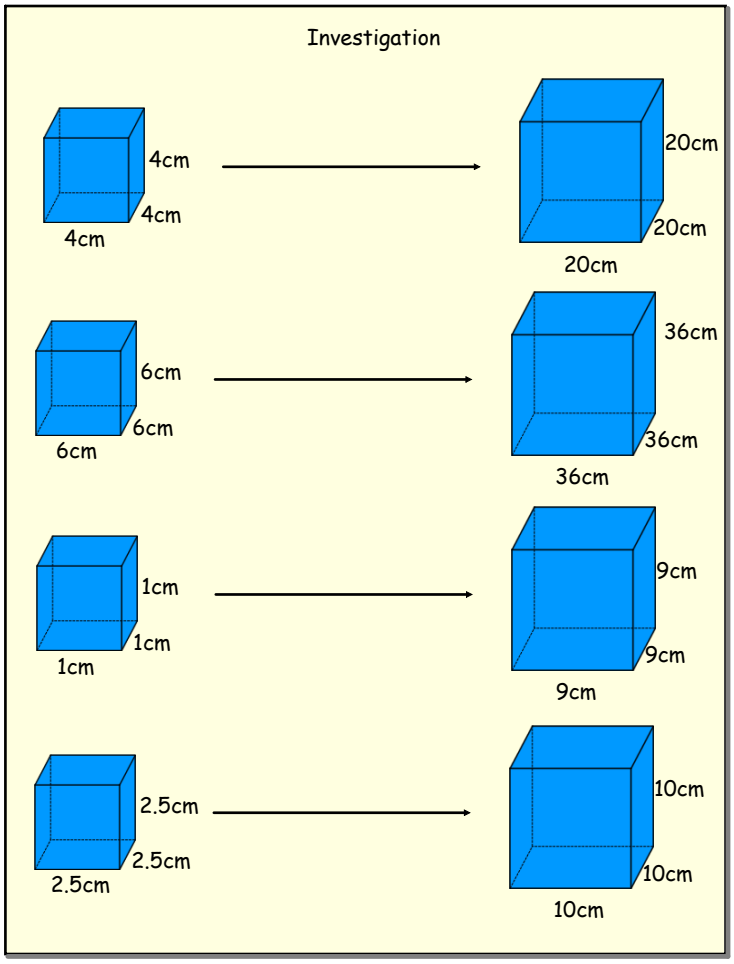


	Side Lengths	Surface Area	Volume
Small Cube	5cm	$150cm^2$	$125cm^3$
Large Cube	15cm	$1350cm^2$	$3375cm^3$
Scale Factor	3	9	27
	k	k^2	k^3

Investigation

When we enlarge a 3D object by a given scale factor, does the volume and the surface area also increase by the same scale factor?

No, but is there still a relationship?



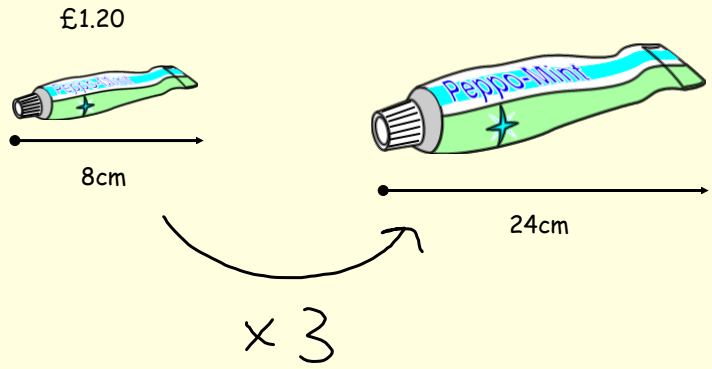
Investigation - Conclusion

When the length scale factor = k

The area scale factor = k^2

The volume scale factor = k^3

How much should the large tube cost?



Volume S.F = $3^3 = 27$

£1.20 × 27

= £32.40