Lesson 9

GCSE Mathematics
Ratio and Similarity

9.1 Revision

Marks Available : 47

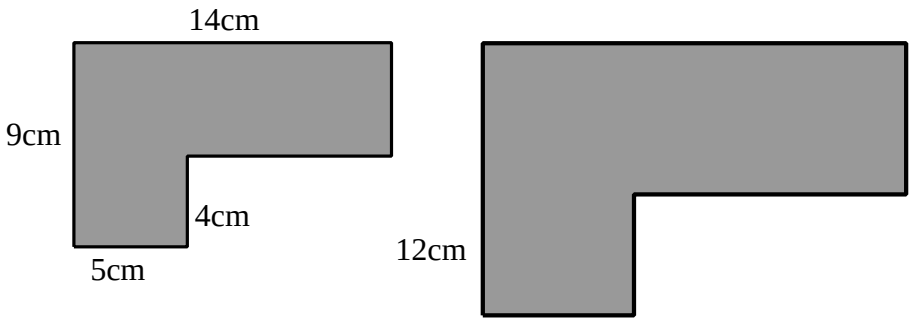
Question 1

A larger cuboid has lengths that are nine times longer than a similar smaller cuboid.
The smaller cuboid measures 6 cm by 7 cm by 8 cm.
What are the measurements of the larger cuboid ?

[2 marks]

Question 2

The two shapes shown below are similar.



(i) Work out the area of the left hand shape.

[2 marks]

(ii) What is the ***length*** scale factor, greater than 1, of the similarity ?

[1 mark]

(iii) What is the ***area*** scale factor, greater than 1 of the similarity ?

[1 mark]

(iv) Work out the area of the right hand shape.

[2 marks]

Question 3

True or false ?

(i) All squares are congruent.

[1 mark]

(ii) All isosceles triangles are similar.

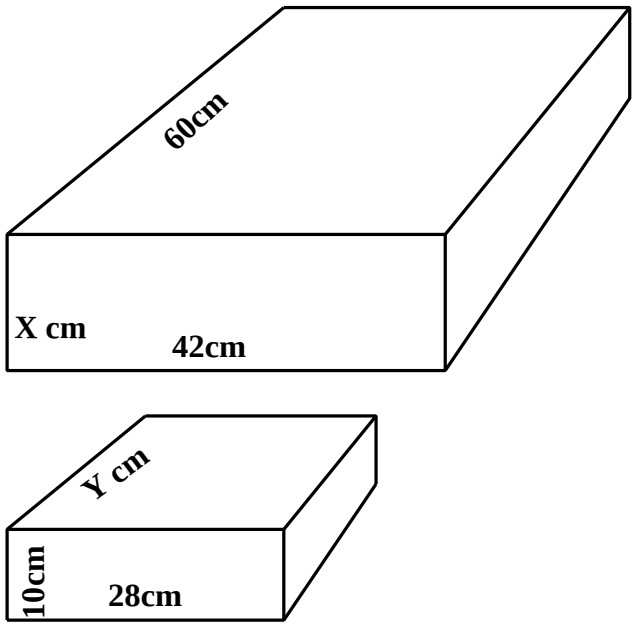
[1 mark]

(iii) All spheres are similar.

[1 mark]

Question 4

The two cuboids shown below are similar.



(i) What is the ***length*** scale factor, greater than 1, of the similarity ?

[1 mark]

(ii) What is the length of the side marked X ?

[1 mark]

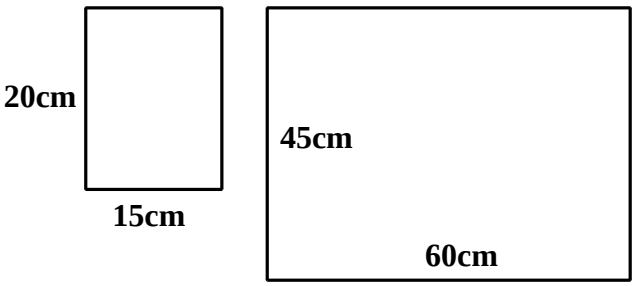
(iii) What is the ***length*** scale factor**,** less than 1, of the similarity ?

[1 mark]

(iv) What is the length of the side marked Y ?

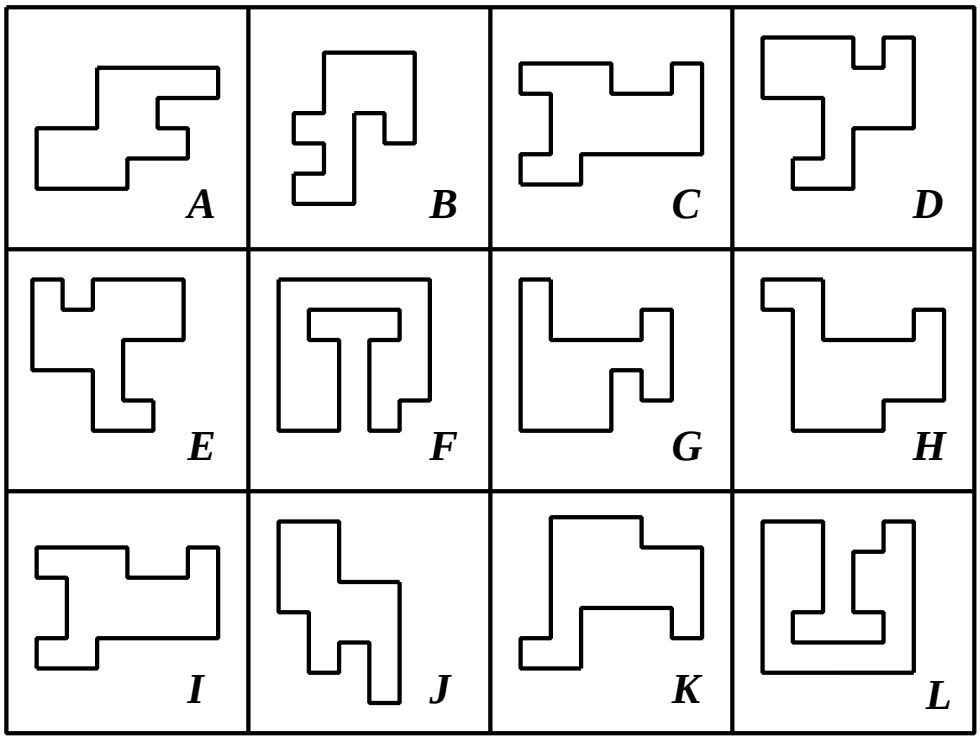
[1 mark]

Question 5
The following two rectangles are similar.
What is the ***length scale factor*** between them ?



[2 marks]

Question 6
For the following shapes, shade in those that are ***directly congruent*** in one colour and, in a different colour, those that are ***indirectly congruent.***
Provide a key to explain what the colours used represent.



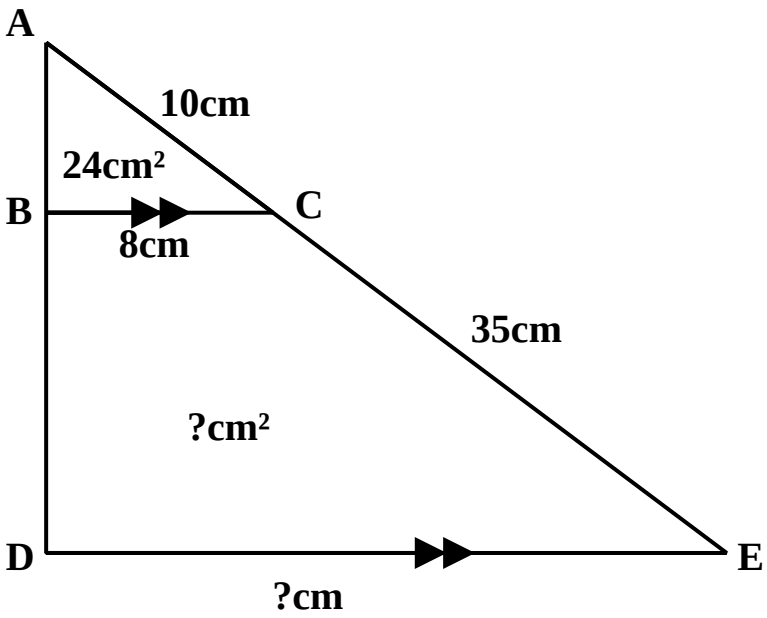
[6 marks]

Question 7

In the diagram below, AC = 10 cm, BC = 8 cm and CE = 35 cm.

The area of $\triangle ABC$ is 24 cm^2.

BC is parallel to DE.



Do **NOT** assume that $\triangle ABC$ is right angled at B

Find the length of DE and the area of the trapezium $BCED$

[6 marks]

Decide, giving a reason, if $\triangle ABC$ is right angled at B or not.

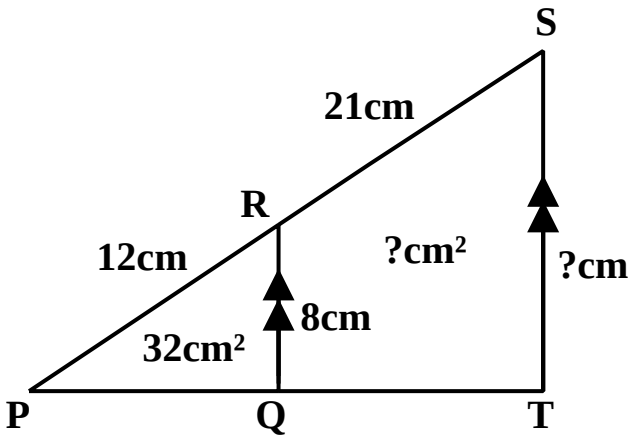
[2 marks]

Question 8

In the diagram below, PR = 12 cm, RT = 21 cm and QR = 8 cm.

The area of $\triangle PQR$ is 32 cm^2.

QR is parallel to TS.



Do **NOT** assume that $\triangle PQR$ is right angled at Q

Find the length TS and the area of the trapezium $QRST$

[6 marks]

Decide, giving a reason, if $\triangle PQR$ is right angled at Q or not.

[2 marks]

Question 9

In this question give your answers in the form $\frac{p}{q}$ in as simple a form as possible where p and q are integers and $q \neq 0$

What is the ***length*** scale factor that maps;

(i) A length of 12 cm onto a length of 21 cm ?

[1 mark]

(ii) A length of 24 cm onto a length of 32 cm ?

[1 mark]

(iii) A length of 36 cm onto a length of 63 cm ?

[1 mark]

Question 10

A mini-doughnut has a diameter of 3 cm.
A jumbo-doughnut, similar to the mini-doughnut, has a diameter of 12 cm.

(i) What is the ***length*** scale factor, greater than 1, of the similarity ?

[1 mark]

(ii) When considering food, it's volume that's important.
How many mini-doughnuts would Mr Stuff have to eat to have consumed the same amount of doughnut material as Mr Munch, who has just eaten **FIVE** jumbo-doughnuts ?

[4 marks]