Lesson 8

GCSE Mathematics
Ratio and Similarity

8.1 Harder Similarity Area Problems

Example
GCSE Examination Question from 2013, paper 4H, Q17 (Edexcel)

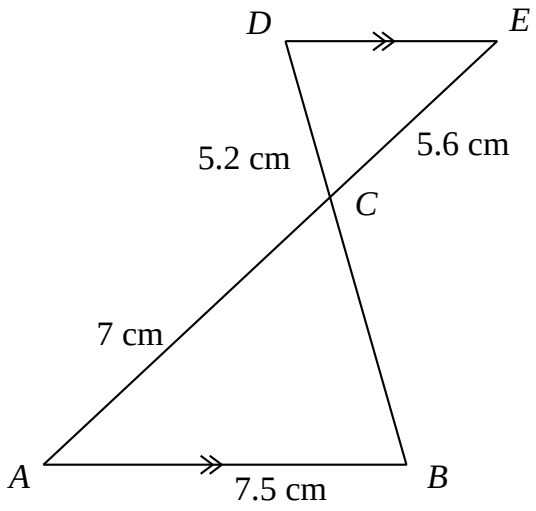


Diagram **NOT** accurately drawn

AB is parallel to *DE*
The lines *AE* and *BD* intersect at *C*
AB = 7.5 cm, *AC* = 7 cm, *CD* = 5.2 cm, *CE* = 5.6 cm

(a) Calculate the length of *BC*

[2 marks]

(b) Calculate the length of *DE*

[2 marks]

(c) The area of triangle *ABC* is 21 cm^2
Calculate the area of triangle *EDC*

[3 marks]

8.2 Exercise

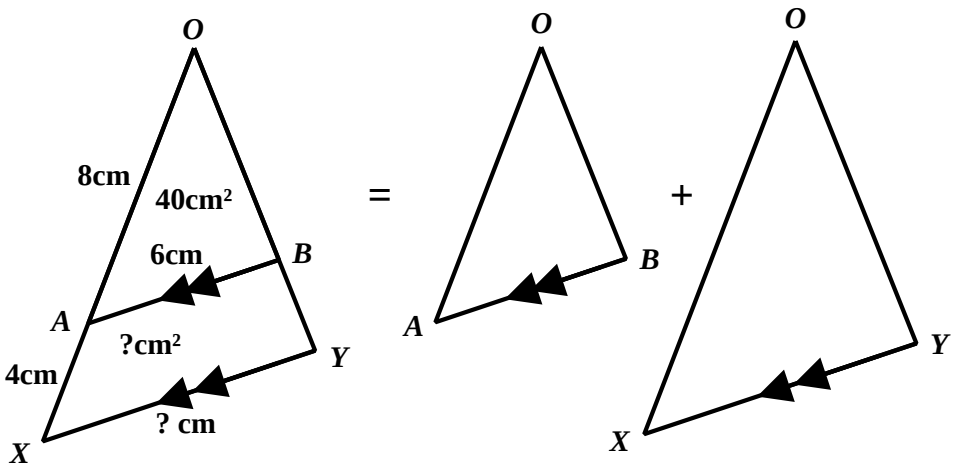
Marks Available : 40

Question 1

Let OA = 8 cm, AX = 4 cm and AB = 6 cm

$\triangle OAB$ has an area of 40 cm^2

Find the length of XY and the area of the trapezium $AXYB$



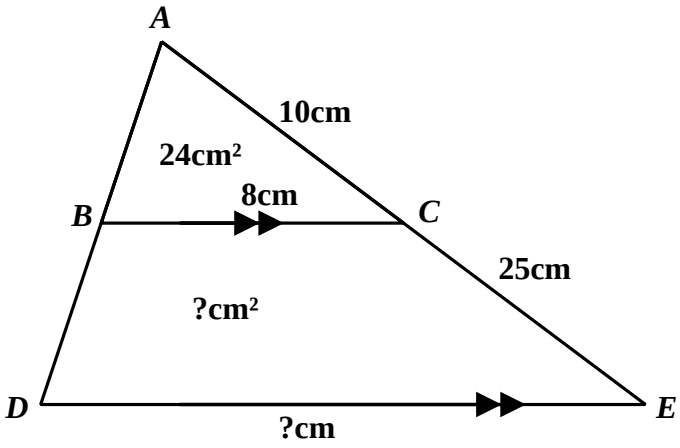
[6 marks]

Question 2

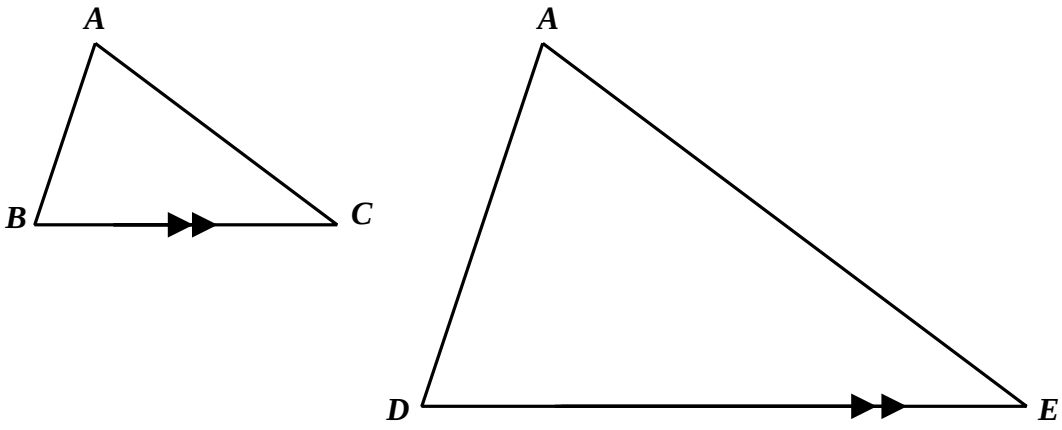
In the diagram below, AC = 10 cm, BC = 8 cm and CE = 25 cm.

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

BC is parallel to DE.



(i) Transfer the relevant measurements from the above diagram onto the one below which shows the two similar triangles separated.



[2 marks]

(ii) Find the length of DE and the area of the trapezium $BDEC$

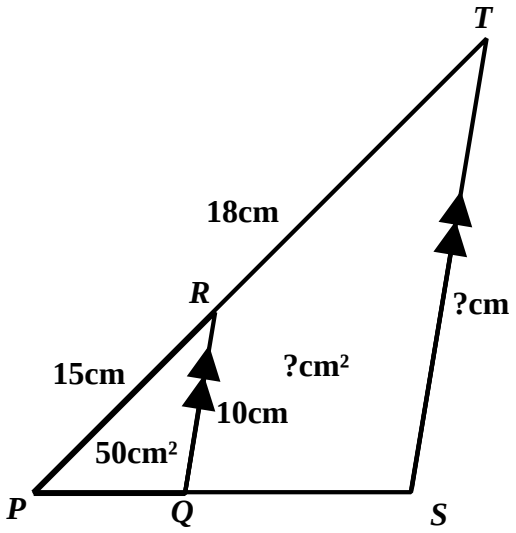
[4 marks]

Question 3

In the diagram below, PR = 15 cm, RT = 18 cm and QR = 10 cm.

The area of $\triangle PQR$ is 50 cm^2

QR is parallel to ST



Find the length of ST and the area of the trapezium $QRTS$.

[6 marks]

Question 4

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 15 cm ?

[1 mark]

(ii) A length of 21 cm onto a length of 24 cm ?

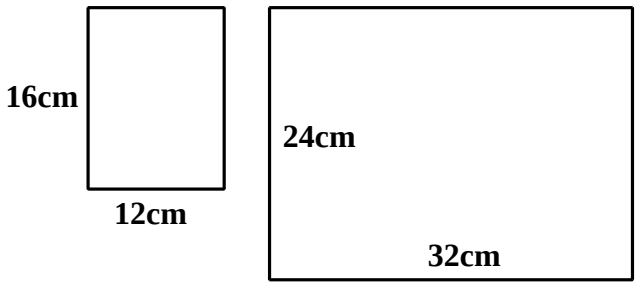
[1 mark]

(iii) A length of 45 cm onto a length of 63 cm ?

[1 mark]

Question 5

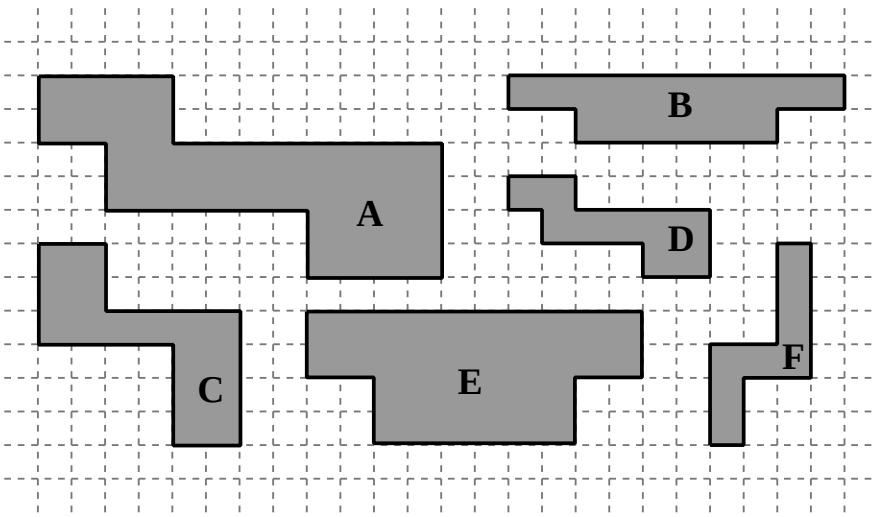
The following two rectangles are similar.
What is the length scale factor between them ?
HINT : Be careful !



[2 marks]

Question 6

Which two of the following shapes are similar ?



[2 marks]

Question 7

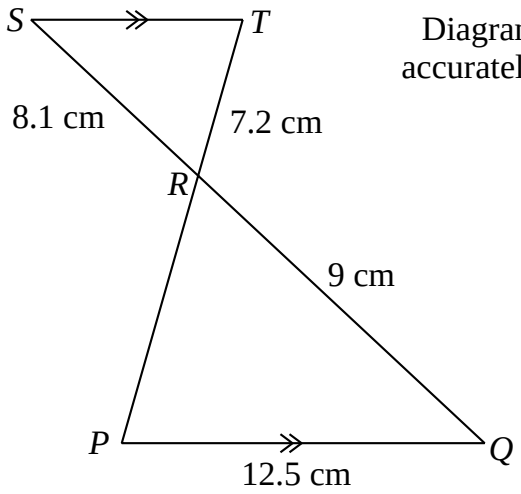


Diagram **NOT** accurately drawn

PQ is parallel to *ST*
The lines *PT* and *QS* intersect at *R*
PQ = 12.5 cm, *QR* = 9 cm, *SR* = 8.1 cm, *TR* = 7.2 cm

(a) Calculate the length of *PR*

[2 marks]

(b) Calculate the length of *ST*

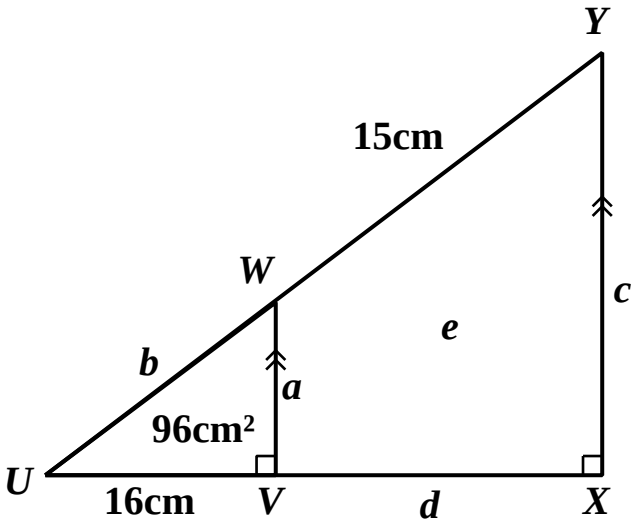
[2 marks]

(c) The area of triangle *PQR* is 36 cm^2
Calculate the area of triangle *RTS*

[3 marks]

Question 8

In the diagram below, UV = 16 cm, and WY = 15cm
The area of $\triangle UVW$, which is right angled, is 96 cm^2
VW is parallel to XY



(i) Find the length of VW, UW, XY then VX

[4 marks]

(ii) Find the area of the trapezium $VWYX$
Good luck with this A* grade question.

[4 marks]