

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Geometry

Understanding similarity and finding unknown sides in similar shapes

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

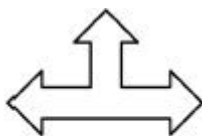
- In all calculations, show clearly how you work out your answer

For question 1 to 3 you may **NOT** use a calculator.



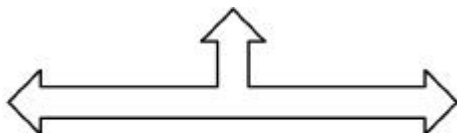
Q1.

Which shape is **similar** to shape X?

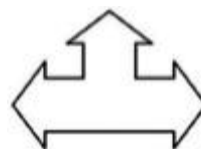


X

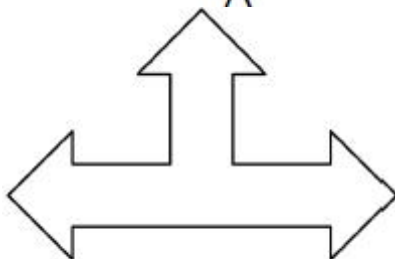
Circle the correct letter.



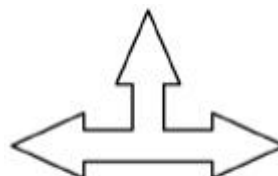
A



B



C



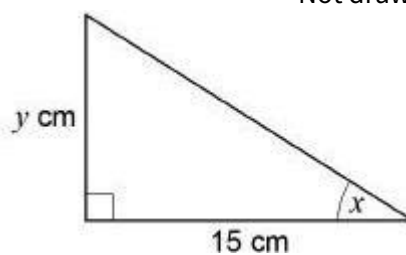
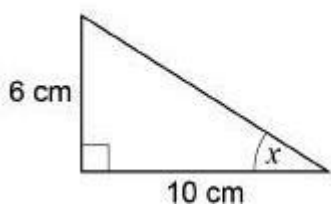
D

(Total 1 mark)

Q2.

Here are two right-angled triangles.

Not drawn accurately



Circle the value of y .

11

7.5

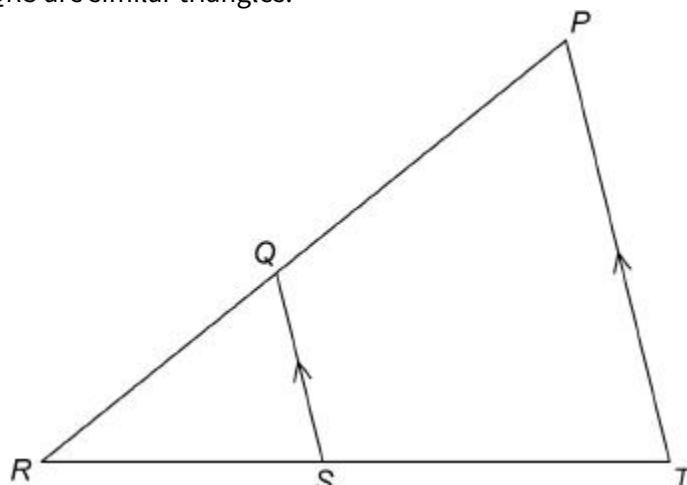
9

4

(Total 1 mark)

Q3.

PRT and QRS are similar triangles.



Not drawn accurately

Which of these is equivalent to $\frac{QR}{PR}$?
Circle your answer.

$$\frac{RS}{ST}$$

$$\frac{PT}{RT}$$

$$\frac{QS}{RS}$$

$$\frac{QS}{PT}$$

(Total 1 mark)

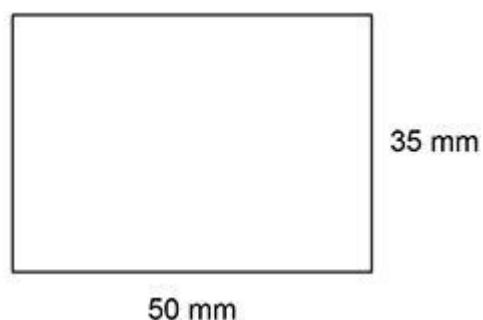
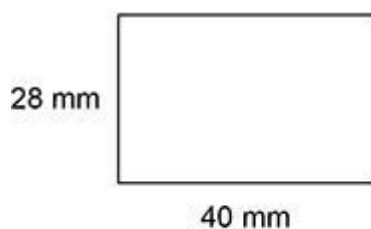
For the rest of the questions, you may use a calculator.



Q4.

Here are two rectangles.

Not drawn accurately



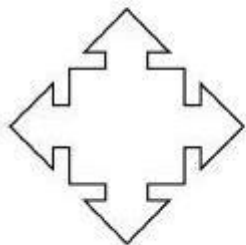
Show that the rectangles are similar.

(Total 1 mark)

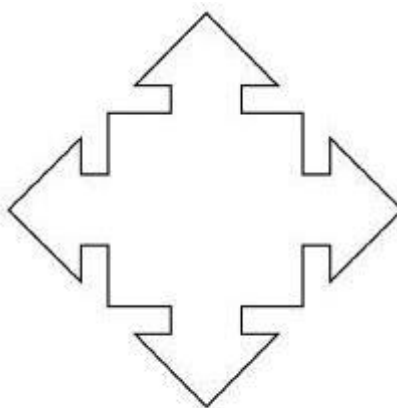
Q5.

Here are two similar shapes, A and B.

Not drawn accurately



A



B

length of edges in A : length of edges in B = 2 : 5

The perimeter of A is 210 mm

Work out the perimeter of B.

(Total 2 marks)

Q6.

Each side of a square is made 3 times as long.

What happens to the perimeter?

Circle your answer.

×3

×6

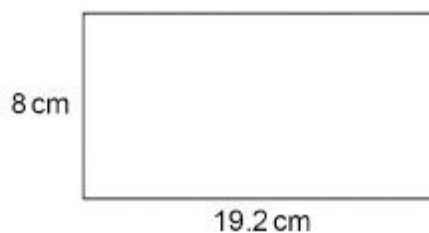
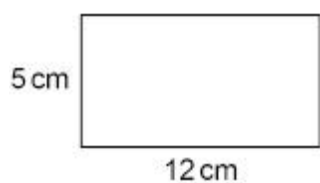
×9

×12

(Total 1 mark)

Q7.

Show that these two rectangles are similar.



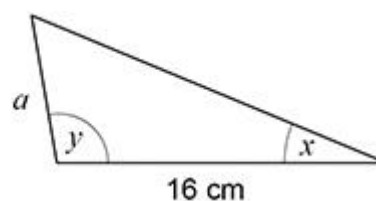
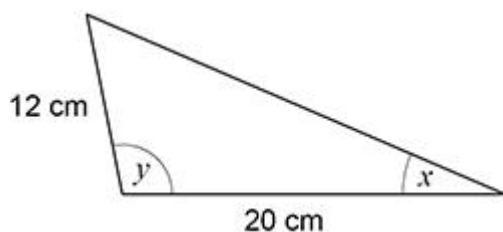
Not drawn accurately

(Total 2 marks)

Q8.

These two triangles are similar.

Not drawn accurately



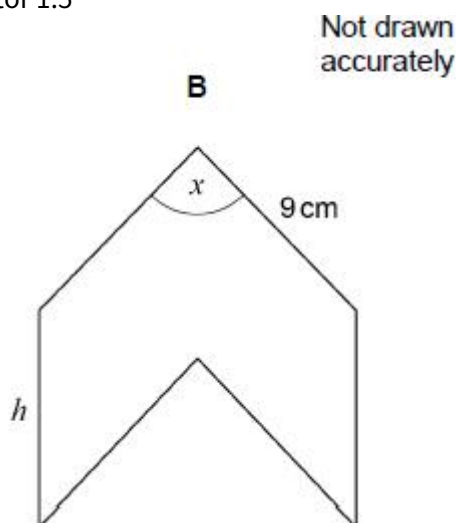
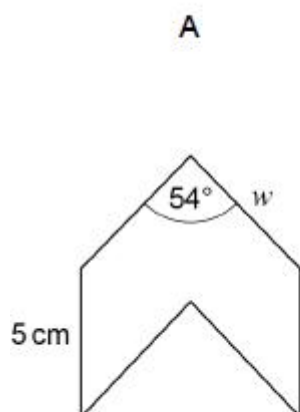
Work out the value of a .

(Total 2 marks)

Q9.

A and B are similar shapes.

B is an enlargement of A with scale factor 1.5

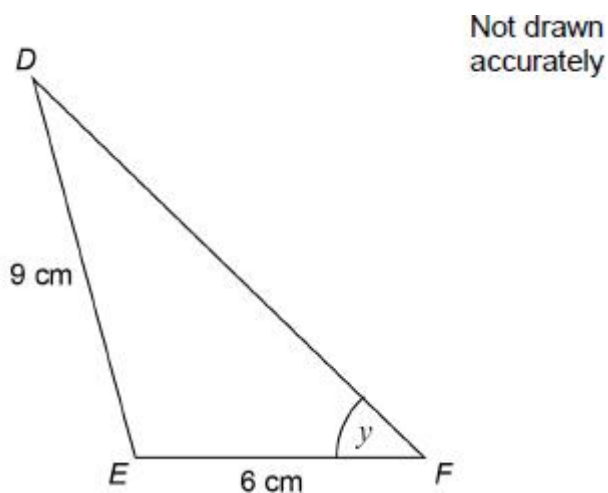
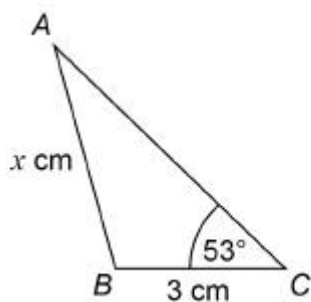


Work out the values of x , h and w .

(Total 3 marks)

Q10.

Triangles ABC and DEF are similar.



(a) Work out the value of x .

(2)

(b) Write down the size of angle y .

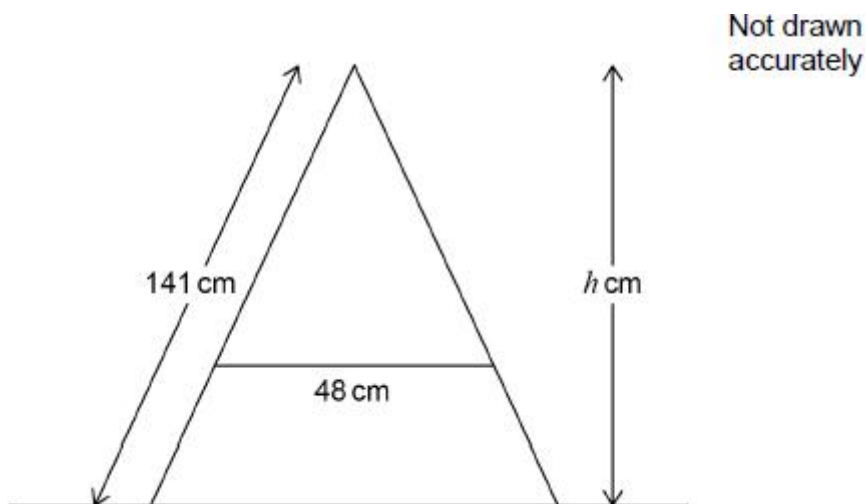
(1)

(Total 3 marks)

Similarity and congruence – Understanding similarity – Cross topic questions

Q11.

The diagram shows the side view of a step ladder with a horizontal strut of length 48 cm
The strut is one third of the way up the ladder.
The symmetrical cross section of the ladder shows two similar triangles.



Work out the vertical height, h cm, of the ladder.

(Total 5 marks)