



# Area & Perimeter (H)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name:	Mel@JustMaths
Total Marks:	

1. Peter decides to cover the floor of a room with a striped carpet.

A shop sells this striped carpet from a roll that is 3m wide at a price of £25 per metre length.

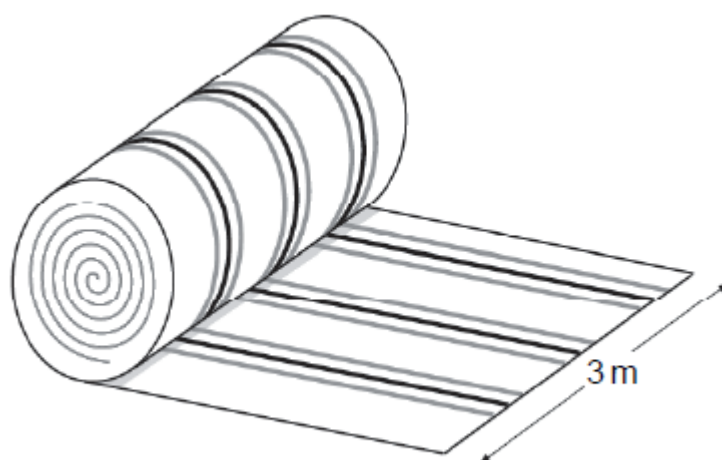


Diagram not drawn to scale

His floor is rectangular in shape with length 13m and width 8 m.

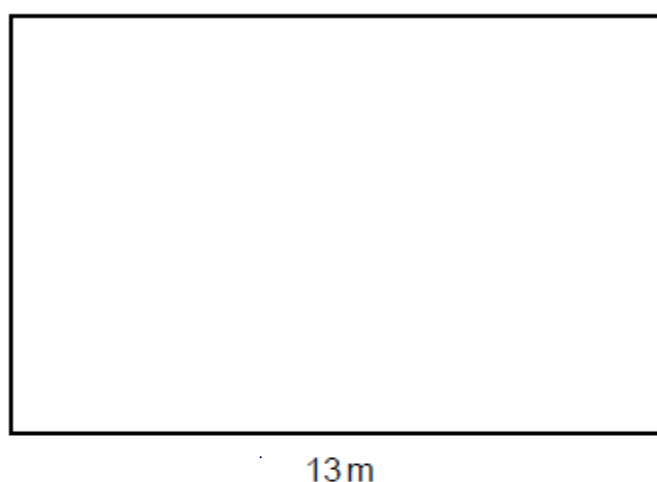


Diagram not drawn to scale

8 stripes  
5 strips  
 $5 \times 8 = 40m$

8 stripes  
3 strips needed  
 $3 \times 13 = 39m$

The carpet is laid to ensure that the stripes on the carpet are parallel to two of the sides of the room and lie in one direction only.

Find the cost of the cheapest way of covering the floor, and state by how much it is cheaper.

Show all your working.

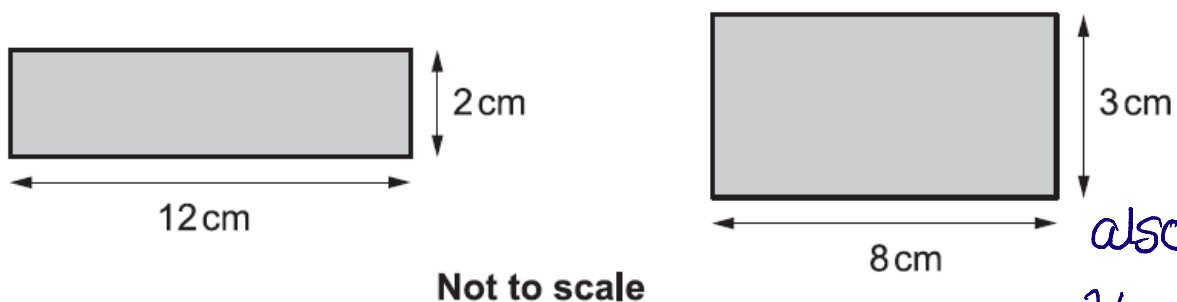
with the stripes running  $\rightarrow 39 \times 25 = £975$  & cheaper by £25  
or stripes  $\uparrow 40 \times 25 = £1000$

[5]

2. It is possible to draw many rectangles that have area  $24 \text{ cm}^2$ .

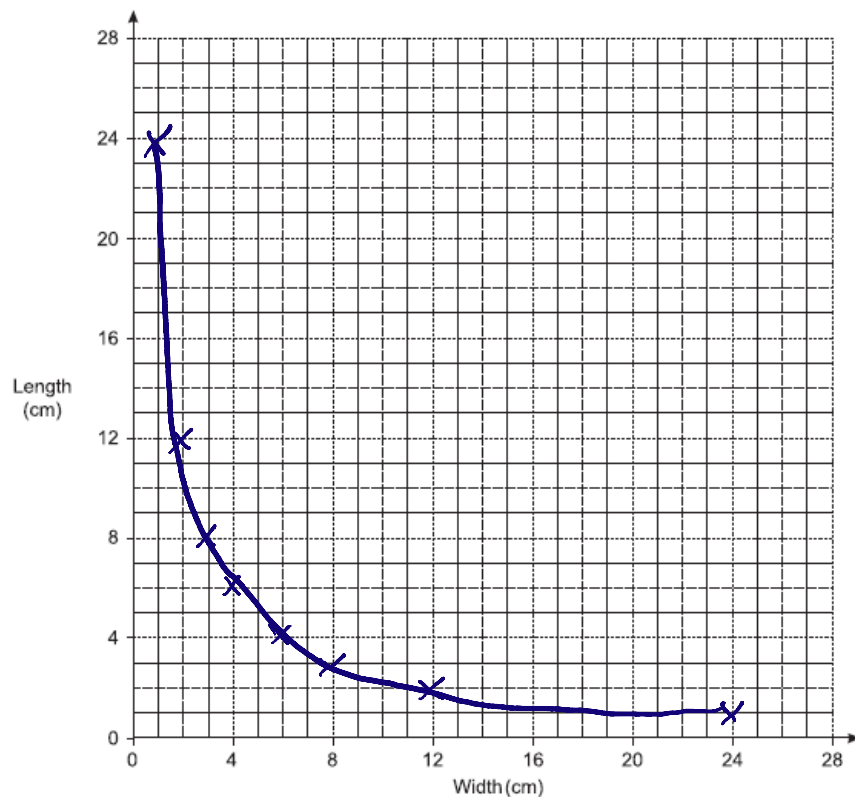
Here are two of them.

$1 \times 24$   $3 \times 8$   
 $2 \times 12$   $4 \times 6$



also  
 $24 \times 1$   
 $12 \times 2$   
 $8 \times 3$   
 $6 \times 4$

(i) Plot the dimensions of these two rectangles on the grid below.

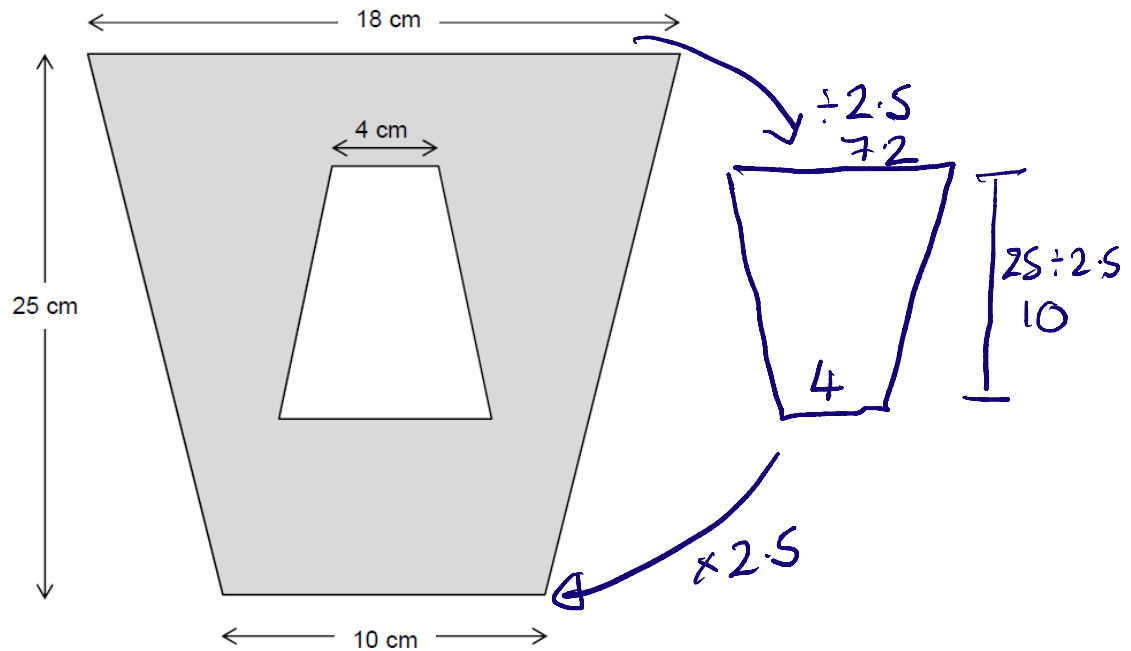


[1]

(ii) Complete the graph to show the relationship between length and width for rectangles with area  $24 \text{ cm}^2$ . ✓

[3]

3. A pattern is made from two similar trapeziums.



Show that the shaded area is  $294 \text{ cm}^2$

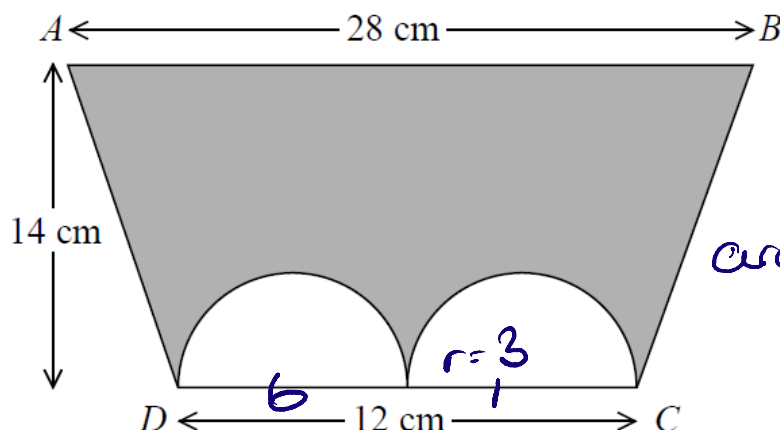
$$\text{large trapezium} = \frac{1}{2}(18+10) \times 25 = 350 \text{ cm}^2$$

$$\text{small} = \frac{1}{2}(7.2+4) \times 10 = 56 \text{ cm}^2$$

$$\text{shaded area} = 350 - 56 = 294 \text{ cm}^2 \quad \text{Q.E.D.}$$

[4]

4. The diagram shows a trapezium ABCD and two identical semicircles.



$$\begin{aligned} \text{circle} &= \pi \times 3^2 \\ &= 9\pi \\ &= 28.2743... \text{ cm}^2 \end{aligned}$$

The centre of each semicircle is on DC.

Work out the area of the shaded region.

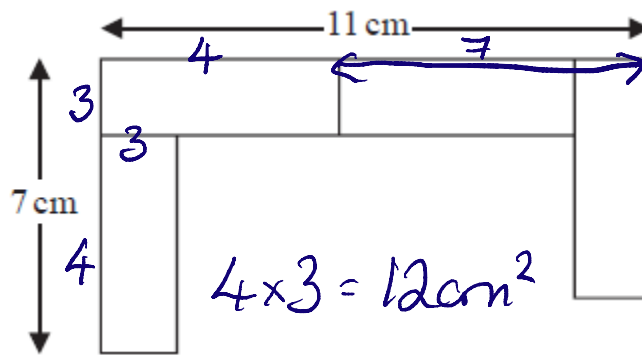
Give your answer correct to 3 significant figures.

$$\text{trapezium} = \frac{1}{2}(12+28) \times 14 = 20 \times 14 = 280$$

$$\begin{aligned} \text{Shaded} &= 280 - 28 \cdot 27 \dots \\ &= \underline{251.725} \dots \dots \dots 252 \dots \dots \dots \text{cm}^2 [4] \end{aligned}$$

5. A pattern is made using identical rectangular tiles.

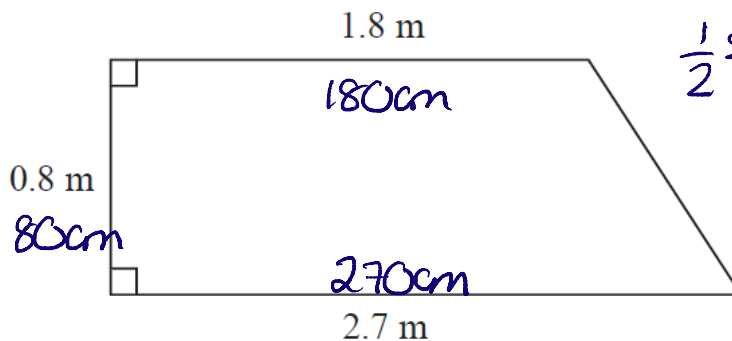
Find the total area of the pattern.



$$12 \times 4 = 48 \text{cm}^2$$

[4]

6. The diagram shows part of a wall in the shape of a trapezium.



$\frac{1}{2}$  sum of parallel sides  
x distance between them

$$= \frac{1}{2}(180+270) \times 80$$

$$= 18000 \text{cm}^2$$

Karen is going to cover this part of the wall with tiles.

Each rectangular tile is 15 cm by 7.5 cm  $15 \times 7.5 = 112.5 \text{cm}^2$

Tiles are sold in packs.

There are 9 tiles in each pack.

Karen divides the area of the wall by the area of a tile to work out an estimate for the number of tiles she needs to buy.

- (a) Use Karen's method to work out an estimate for the number of packs of tiles she needs to buy.

$$18000 \div 112.5 = 160 \text{ tiles}$$

$$\text{number of packs } 160 \div 9 = 17.7$$

or 18 packs

..... 18 packs ..... [5]

Karen is advised to buy 10% more tiles than she estimated.

Buying 10% more tiles will affect the number of the tiles Karen needs to buy.

She assumes she will need to buy 10% more packs of tiles.

- (b) Is Karen's assumption correct?

You must show your working.

$$10\% \text{ of } 160 = 16 \text{ tiles}$$

$$\text{total} = 176$$

$$10\% \text{ of } 18 \text{ packs} = 1.8 \text{ packs}$$

$$1.8 \times 9 = 16.2 \text{ tiles}$$

$$\text{total} = 178 \text{ tiles}$$

she is incorrect

[2]

7. The diagram shows a square with perimeter 16 cm.

$$\text{each side} = 4 \text{ cm}$$

Work out the proportion of the area inside the square that is shaded.

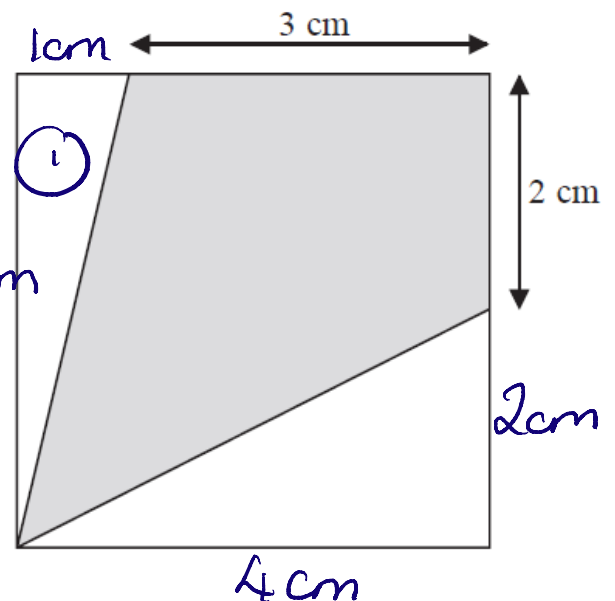
$$\text{area of total square} = 4 \times 4 = 16 \text{ cm}^2$$

$$\begin{aligned} \textcircled{1} \frac{1 \times 4}{2} &= 2 \\ \textcircled{2} \frac{2 \times 4}{2} &= 4 \end{aligned} \left. \vphantom{\begin{aligned} \textcircled{1} \frac{1 \times 4}{2} &= 2 \\ \textcircled{2} \frac{2 \times 4}{2} &= 4 \end{aligned}} \right\} 6$$

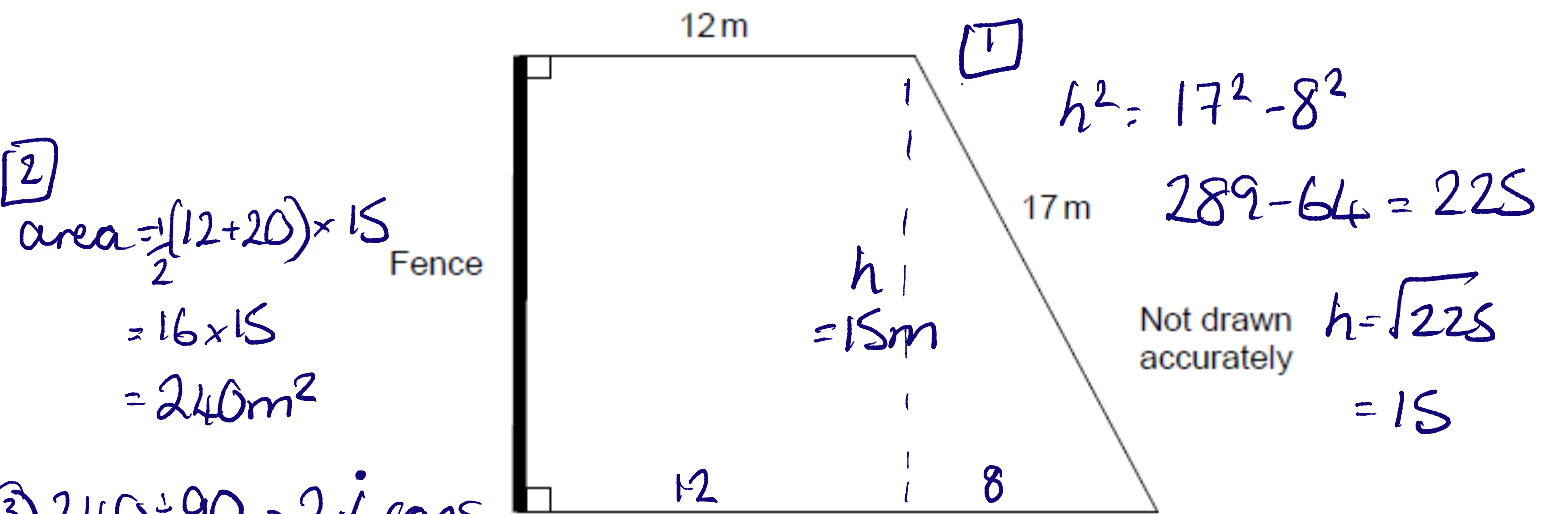
$$\text{shaded} = 16 - 6 = 10 \text{ cm}^2$$

$$\text{Proportion} = \frac{10}{16}$$

.....  $\frac{5}{8}$  ..... [5]



8. The diagram shows a lawn with a fence along one edge.



③  $240 \div 90 = 2.6 \text{ cans}$   
 $\therefore 3 \text{ cans are needed } 3 \times 19.25$   
 One can of weedkiller covers 90 square metres.

Each can costs £19.25

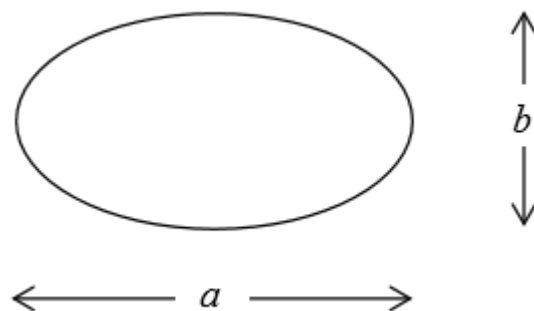
£57.75

Work out the total cost of the cans of weedkiller needed to cover the lawn.

[5]

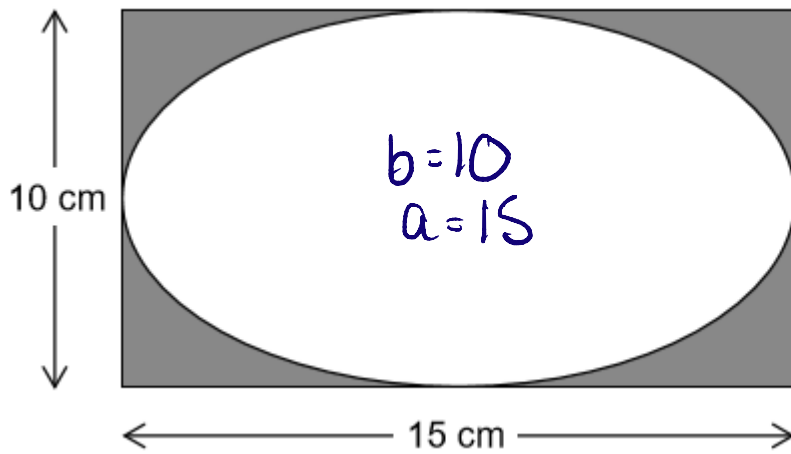
9. The area of an ellipse, width  $a$  and height  $b$ , is given by

$$\frac{\pi ab}{4}$$



A rectangular photograph measures 15 cm by 10 cm

It is put into a frame as shown.



Not drawn accurately

rectangle area  
=  $150\text{cm}^2$

The part of the photograph that can be seen is an ellipse.

Work out the percentage of the photograph that can be seen.

$$\text{ellipse area} = \frac{\pi \times 10 \times 15}{4} = \frac{150\pi}{4}$$

[3]

$$\begin{aligned} \text{area that can be seen} &= \frac{37.5\pi}{150} \times 100 \\ &= \underline{\underline{78.5\%}} \end{aligned}$$

## CREDITS AND NOTES

Question	Awarding Body	Question	Awarding Body
1	WJEC Eduqas	9	AQA
2	OCR		
3	AQA		
4	Pearson Edexcel		
5	Pearson Edexcel		
6	Pearson Edexcel		
7	Pearson Edexcel		
8	AQA		

### Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.



### Links:

AQA <http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300>

OCR <http://ocr.org.uk/gcsemaths>

Pearson Edexcel <http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html>

WJEC Eduqas <http://www.eduqas.co.uk/qualifications/mathematics/gcse/>

### Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2

WJEC Eduqas – Sample Assessment Material