



## Differentiation (Perimeter/Area/Volume Problems)

Revise this topic →



← Check your work

This booklet features original exam style questions designed by me. They do not feature in past papers but are good practice for your exams.

The content is designed to reflect the style of the **AQA Level 2 Certificate in Further Maths**. It may not be suitable for other courses.

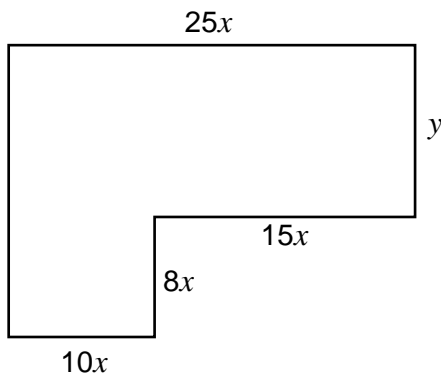




Answer **all** questions in the spaces provided.

1 This shape is made from two rectangles.

All dimensions are in centimetres.



Not drawn  
accurately

The perimeter of the shape is 298 cm

1 (a) Show that  $y = 149 - 33x$  [2 marks]

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The area of the shape is  $A \text{ cm}^2$

1 (b) Show that  $A = 3725x - 745x^2$  [2 marks]

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*Do not write  
outside the  
box*

1 (c) Use differentiation to work out the maximum value of  $A$  as  $x$  varies. **[3 marks]**

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Answer \_\_\_\_\_

$\frac{7}{7}$

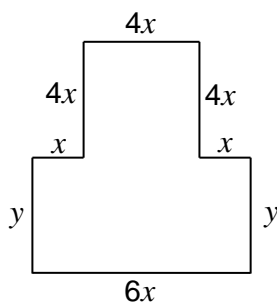
Turn over ►





2 This shape is made from a square and a rectangle.

All dimensions are in centimetres.



Not drawn  
accurately

The perimeter of the shape is 220 cm

2 (a) Show that  $y = 110 - 10x$  [2 marks]

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The area of the shape is  $A \text{ cm}^2$

2 (b) Show that  $A = 660x - 44x^2$  [2 marks]

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Do not write  
outside the  
box

**2 (c)** Use differentiation to work out the maximum value of  $A$  as  $x$  varies. **[3 marks]**

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Answer \_\_\_\_\_

$\frac{7}{7}$

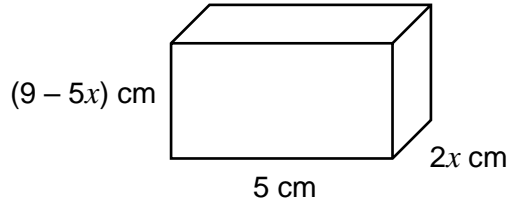
Turn over ►





Do not write outside the box

3 This lengths of a cuboid are 5 cm,  $2x$  cm and  $(9 - 5x)$  cm



Not drawn accurately

3 (a) Show that the volume of the cuboid,  $V$ , is given by  $V = 90x - 50x^2$  [2 marks]

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3 (b) Use differentiation to work out the maximum value of  $V$  as  $x$  varies. [3 marks]

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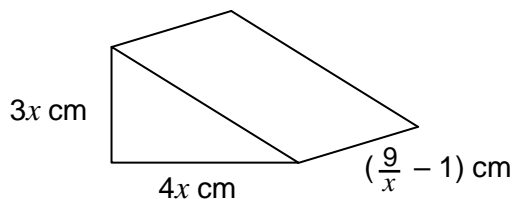
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Answer \_\_\_\_\_



4 Here is a triangular prism.



Not drawn accurately

4 (a) Show that the volume of the prism,  $V$ , is given by  $V = 54x - 6x^2$  [2 marks]

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4 (b) Use differentiation to work out the maximum value of  $V$  as  $x$  varies. [3 marks]

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Answer \_\_\_\_\_

