

**GENERAL CERTIFICATE OF SECONDARY EDUCATION**  
**MATHEMATICS C (GRADUATED ASSESSMENT)**  
MODULE M10 – SECTION A

**B280A**

Candidates answer on the question paper

**OCR Supplied Materials:**  
None

**Other Materials Required:**

- Geometrical instruments
- Tracing paper (optional)

**Monday 9 March 2009**  
**Morning**

**Duration: 30 minutes**



Candidate Forename		Candidate Surname	
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Centre Number							Candidate Number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

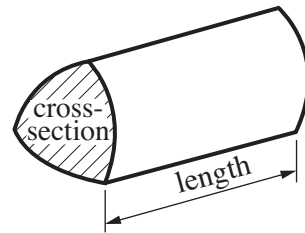
**WARNING**

No calculator can be used for Section A of this paper

FOR EXAMINER'S USE	
SECTION A	
SECTION B	
<b>TOTAL</b>	

## Formulae Sheet

**Volume of prism** = (area of cross-section)  $\times$  length

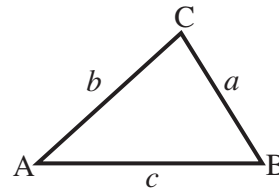


**In any triangle ABC**

**Sine rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

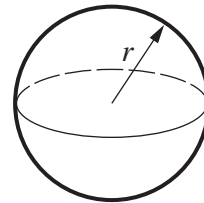
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

**Area of triangle** =  $\frac{1}{2} ab \sin C$



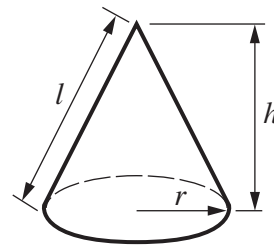
**Volume of sphere** =  $\frac{4}{3} \pi r^3$

**Surface area of sphere** =  $4\pi r^2$



**Volume of cone** =  $\frac{1}{3} \pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$ ,  
where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**PLEASE DO NOT WRITE ON THIS PAGE**

1 Express  $0.\dot{4}\dot{1}$  as a fraction.

..... [2]

2 Simplify.

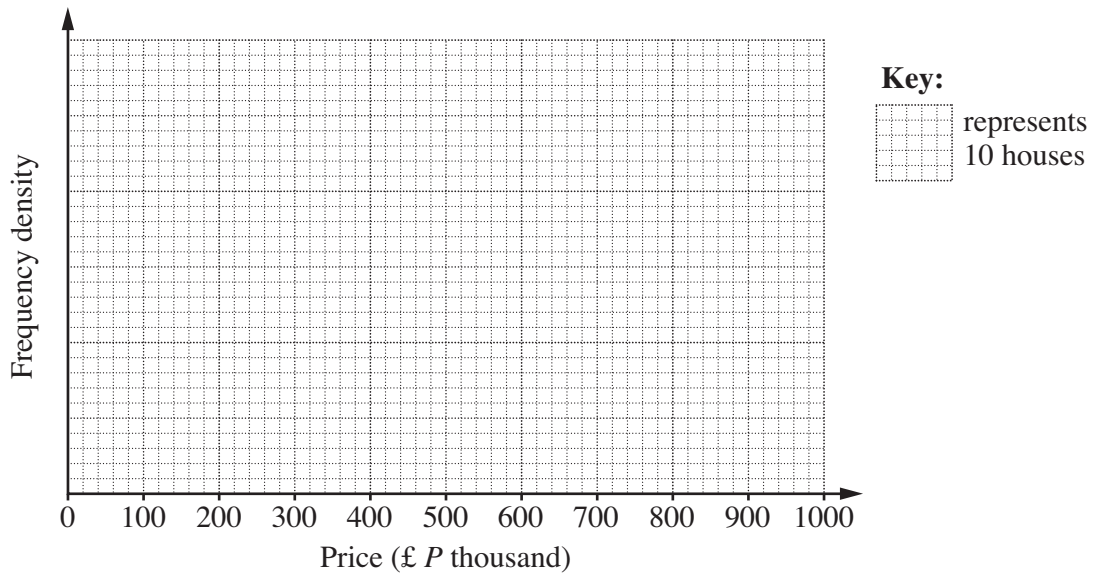
$$(4x^3y \times 9xy)^{\frac{1}{2}}$$

..... [3]

- 3 This table shows the distribution of the prices of 200 houses in region A.

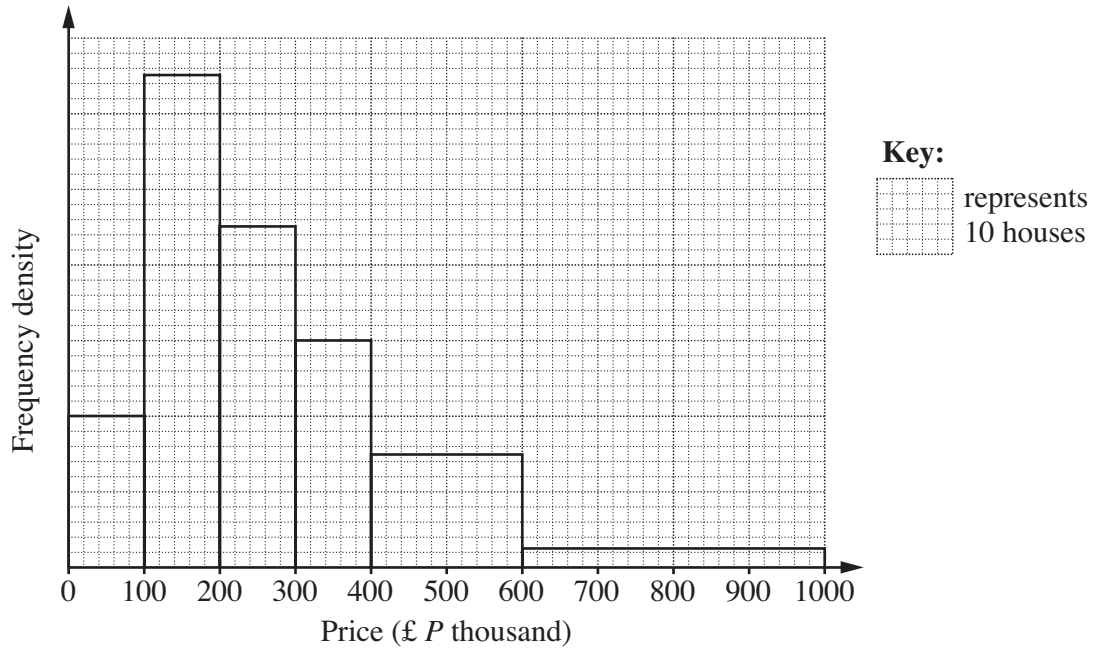
Price (£ $P$ thousand)	Frequency
$0 < P \leq 100$	0
$100 < P \leq 200$	20
$200 < P \leq 300$	50
$300 < P \leq 400$	40
$400 < P \leq 600$	30
$600 < P \leq 1000$	60

- (a) Draw a histogram to represent the prices of houses in region A.



[2]

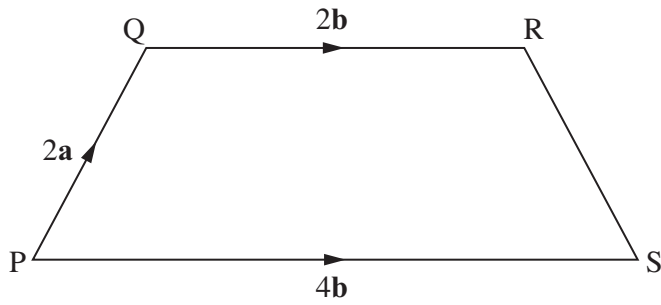
(b) This histogram shows the prices of 200 houses in region B.



Make two comments comparing the prices of houses in the two regions.

1. ....
- .....
2. ....
- ..... [2]

4 PQRS is an isosceles trapezium.



Not to scale

$\vec{PQ} = 2\mathbf{a}$ ,  $\vec{QR} = 2\mathbf{b}$  and  $\vec{PS} = 4\mathbf{b}$ .

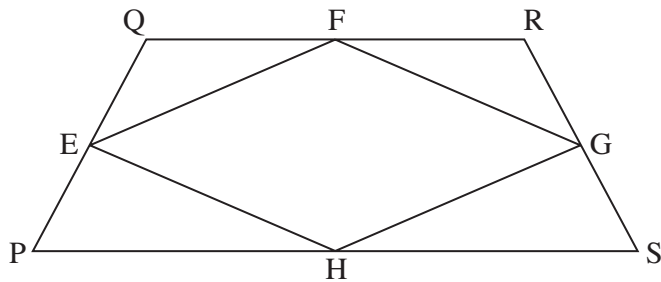
(a) Show that  $\vec{RS} = 2\mathbf{b} - 2\mathbf{a}$ .

.....

.....

..... [1]

(b) E, F, G and H are the midpoints of the sides of the isosceles trapezium PQRS. The midpoints are joined to make a quadrilateral.



Not to scale

(i) Show that  $\vec{FG} = 2\mathbf{b} - \mathbf{a}$ .

.....

.....

..... [2]

- (ii) What type of quadrilateral is EFGH?  
Use vectors to justify your answer.

EFGH is a ..... because .....  
 .....  
 ..... [3]

- 5 Solve algebraically these simultaneous equations.

$$y = 5x^2 + 4x - 5$$

$$2x + y = 3$$

$$x = \dots\dots\dots y = \dots\dots\dots$$

$$x = \dots\dots\dots y = \dots\dots\dots [5]$$

**TURN OVER FOR QUESTION 6**

6 (a) Simplify.

$$\frac{12}{\sqrt{3}}$$

(a) ..... [2]

(b) Expand and simplify.

$$(\sqrt{3} - 5)^2$$

(b) ..... [3]



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