



**M8**

**GENERAL CERTIFICATE OF SECONDARY EDUCATION  
 MATHEMATICS C (GRADUATED ASSESSMENT)  
 MODULE M8 – SECTION B**

**B278B**



Candidates answer on the question paper.

**OCR supplied materials:**  
 None

**Other materials required:**

- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

**Thursday 20 January 2011  
 Morning**

**Duration: 30 minutes**



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**MODIFIED LANGUAGE**

**INSTRUCTIONS TO CANDIDATES**

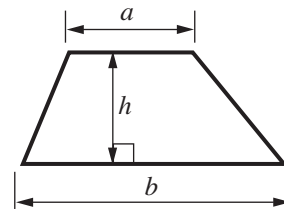
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Answer **all** the questions.
- Do **not** write in the bar codes.

**INFORMATION FOR CANDIDATES**

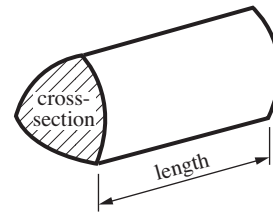
- The number of marks is given in brackets [ ] at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

## Formulae Sheet

**Area of trapezium** =  $\frac{1}{2}(a + b)h$



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

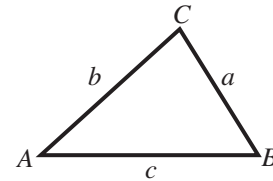


**In any triangle  $ABC$**

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

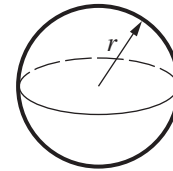
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



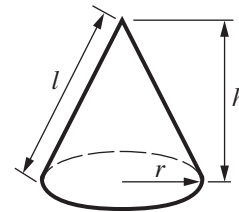
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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

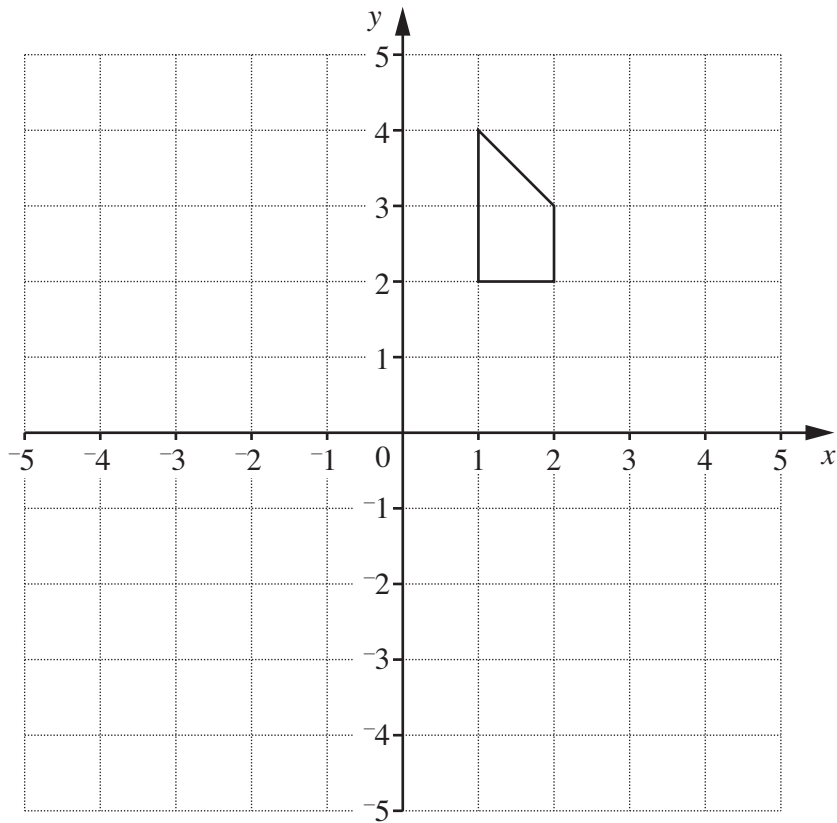
**PLEASE DO NOT WRITE ON THIS PAGE**

8 Anna writes:

The single transformation equivalent to a reflection in the line  $x = -1$  and then a reflection in the line  $y = 1$  is a reflection.

Bob writes:

The single transformation equivalent to a reflection in the line  $x = -1$  and then a reflection in the line  $y = 1$  is a rotation.



Decide who is correct and then describe **fully** the **single** transformation.  
You may use the shape on the grid to help you.

..... is correct because the single transformation is .....

..... [3]

9 A local newspaper reports that the value of houses fell by 12% between 1st September 2007 and 1st September 2008.

(a) On 1st September 2007 the value of Mike's house was £180 000.

What was its value on 1st September 2008?

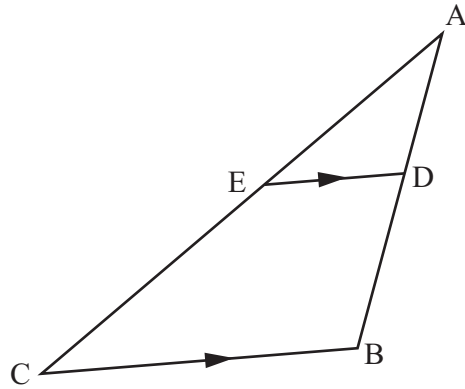
(a) £ ..... [2]

(b) On 1st September 2008 the value of Jane's house was £275 000.

What had been its value on 1st September 2007?

(b) £ ..... [3]

- 10 ABC and ADE are triangles.  
ED is parallel to CB.



Not to scale

- (a) Explain why triangles ADE and ABC are similar.

.....

.....

.....

..... [2]

- (b)  $AE = 4\text{ cm}$ ,  $AC = 10\text{ cm}$  and  $ED = 3\text{ cm}$ .

Calculate length CB.

(b) ..... cm [2]

11 Joe invests £6500 at 4% **compound** interest for three years.

Calculate the value of his investment after three years.

£ ..... [3]

12 This table shows some of Anne's monthly phone bills.

	January	February	March	April	May	June
Phone bill (£)	45	36	81	39	42	57

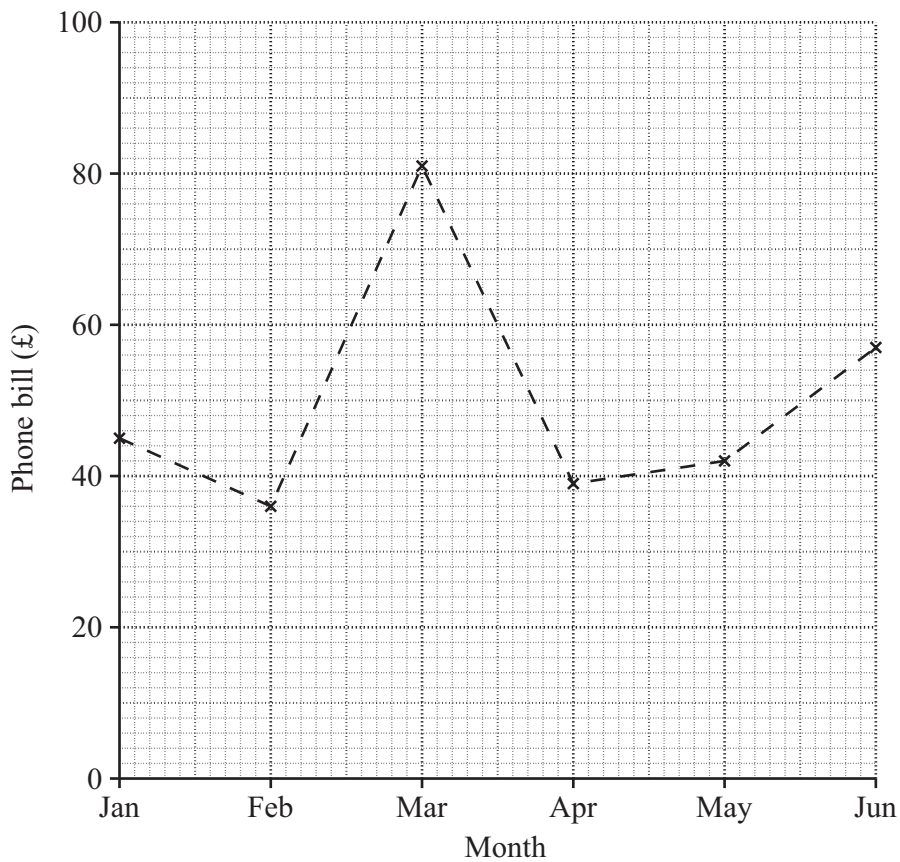
The 3-month moving average for January, February and March is £54.

(a) Calculate the next three moving averages.

(a) £54 £..... £..... £..... [2]

(b) The graph shows the monthly bills.

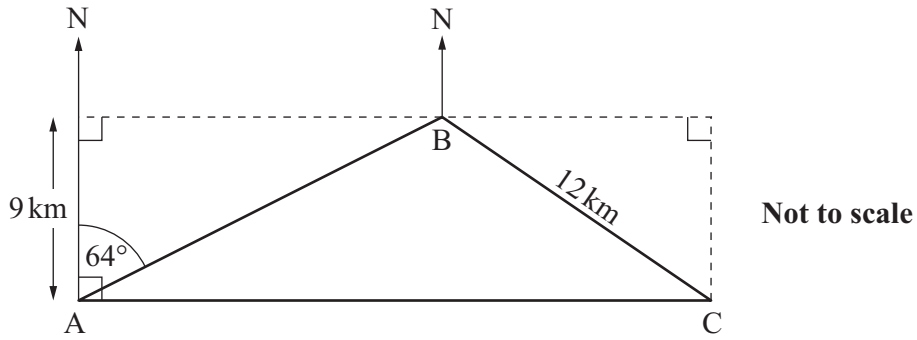
Plot the moving averages.



[2]

**TURN OVER FOR QUESTION 13**

13



Jules sails from A on a bearing of  $064^\circ$  to reach B.  
 B is 9 km North of A.

(a) Calculate the distance from A to B.

(a) ..... km [3]

(b) Jules then sails 12 km from B to C. C is due East of A.

On what bearing does he sail?

(b) ..... $^\circ$  [3]

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