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|-----------------------|--|----------------------|--|
| Candidate<br>forename |  | Candidate<br>surname |  |
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| Centre<br>number |  |  |  |  |  | Candidate<br>number |  |  |  |  |
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**B278B**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**MODULE M8 (SECTION B)**

**THURSDAY 20 JANUARY 2011: Morning**

**DURATION: 30 minutes**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the question paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Geometrical instruments**

**Tracing paper (optional)**

**Scientific or graphical calculator**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

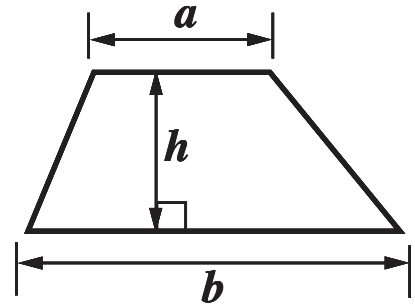
- Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show 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.

## **INFORMATION FOR CANDIDATES**

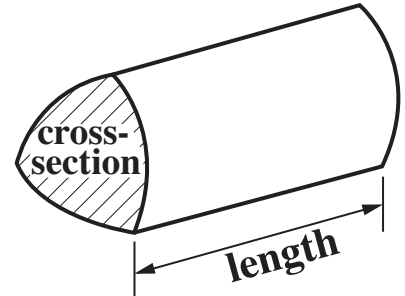
- The number of marks is given in brackets [ ] at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.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

# FORMULAE SHEET

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

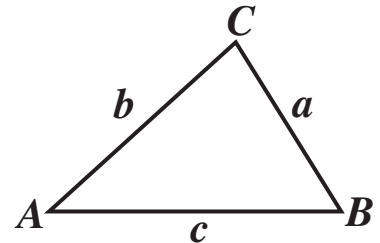


**Volume of prism** = (area of cross-section)  $\times$  length



**In any triangle ABC**

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

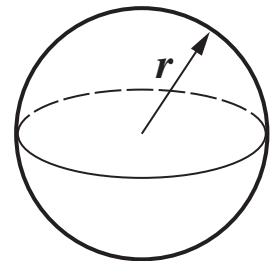


**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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

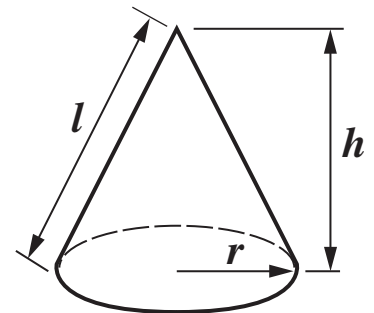
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

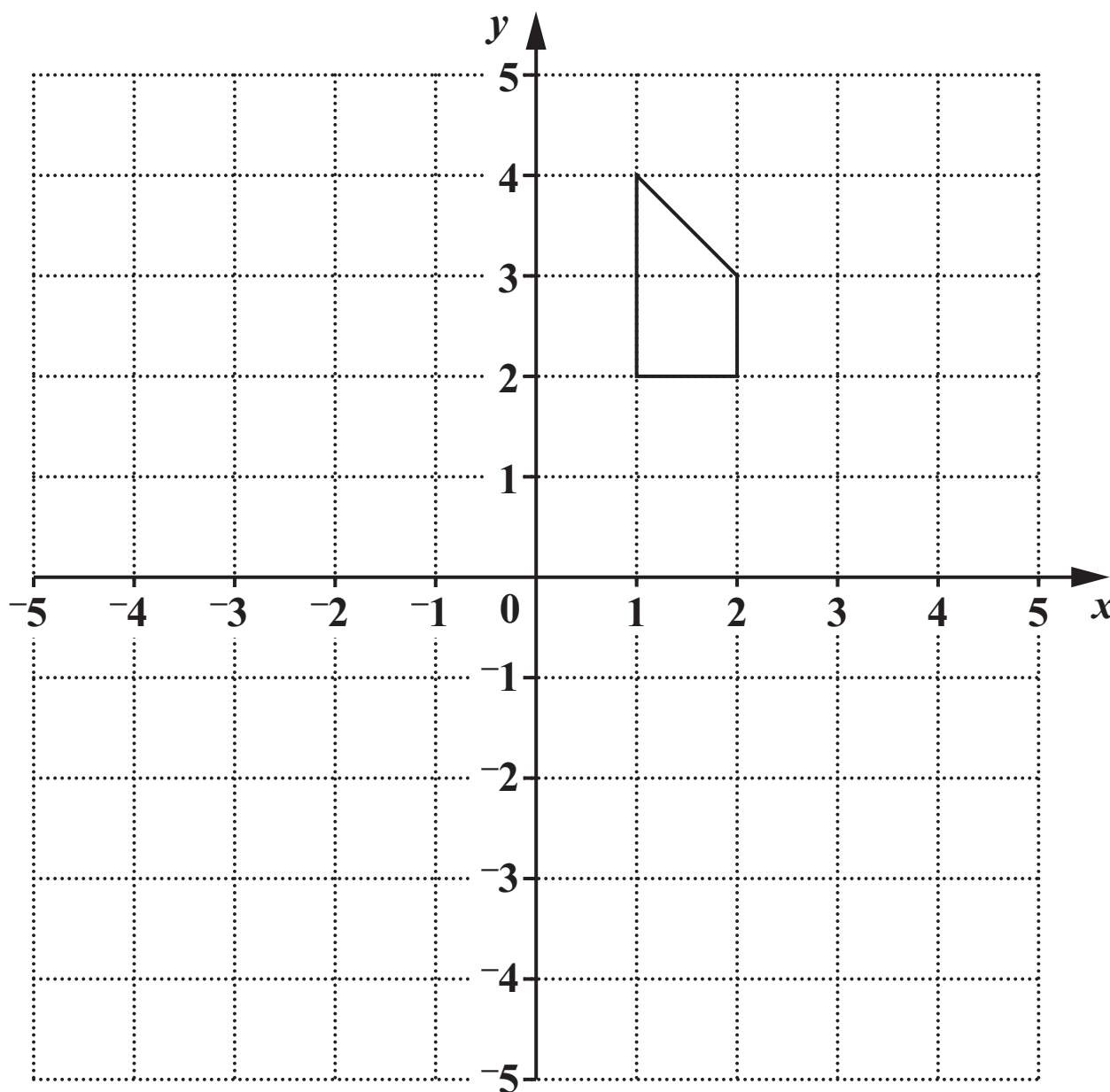
$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

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?**

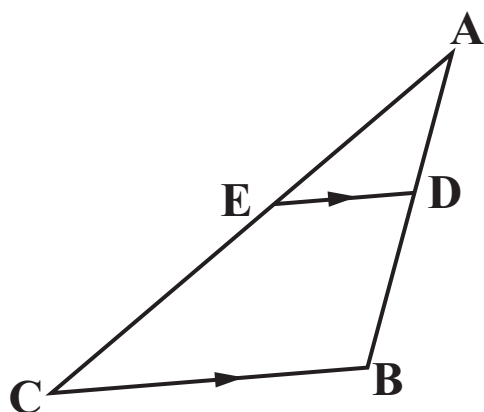
**(a) £ \_\_\_\_\_ [2]**

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

**What was 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.**

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**[2]**



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

**Calculate length  $CB$ .**

**(b) \_\_\_\_\_ cm [2]**

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**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   |

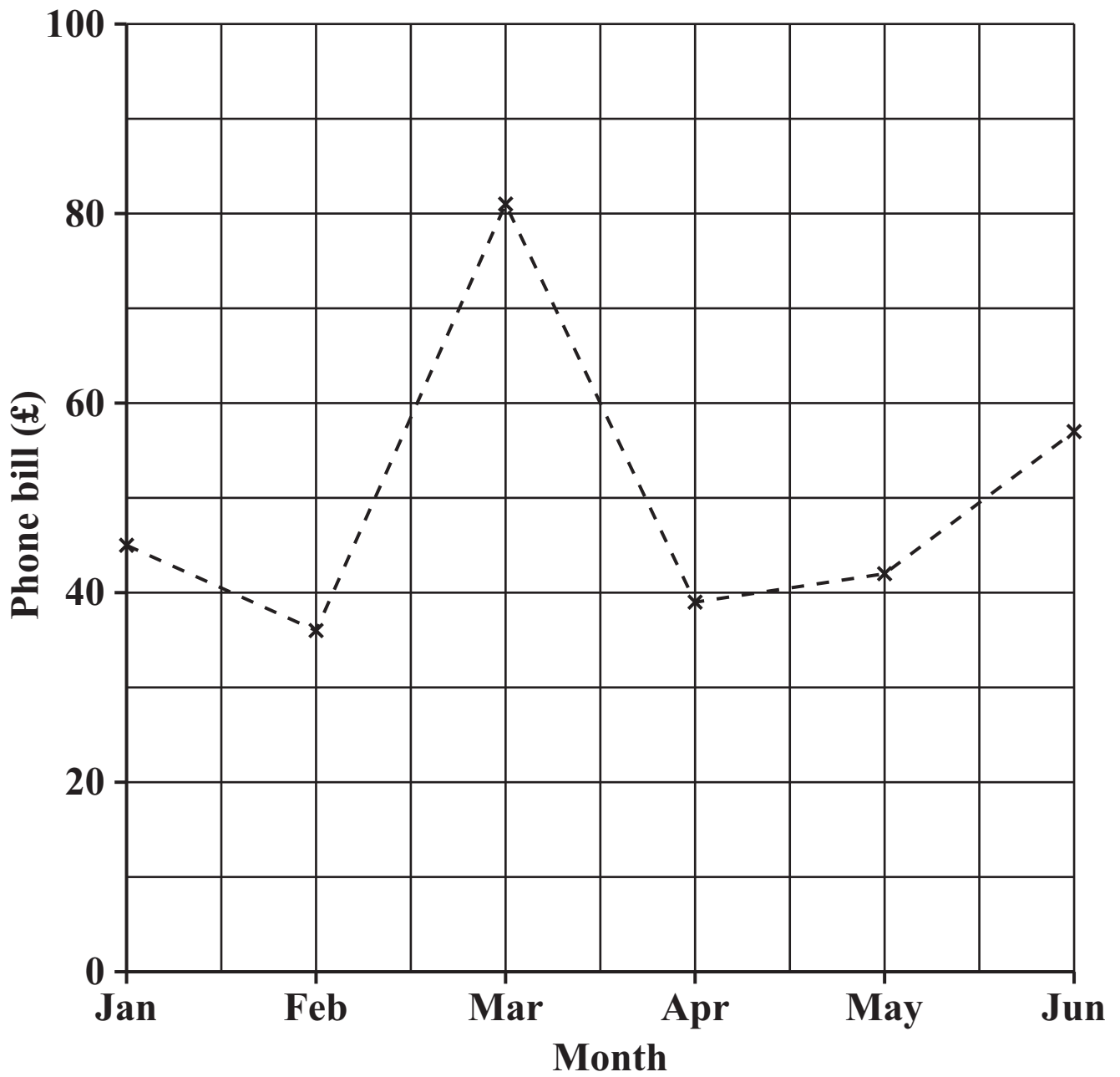
**The 3-month moving average for January, February and March is £54.**

**(a) Calculate the next three moving averages.**

**(a) £54 £\_\_\_\_\_ £\_\_\_\_\_ £\_\_\_\_\_ [2]**

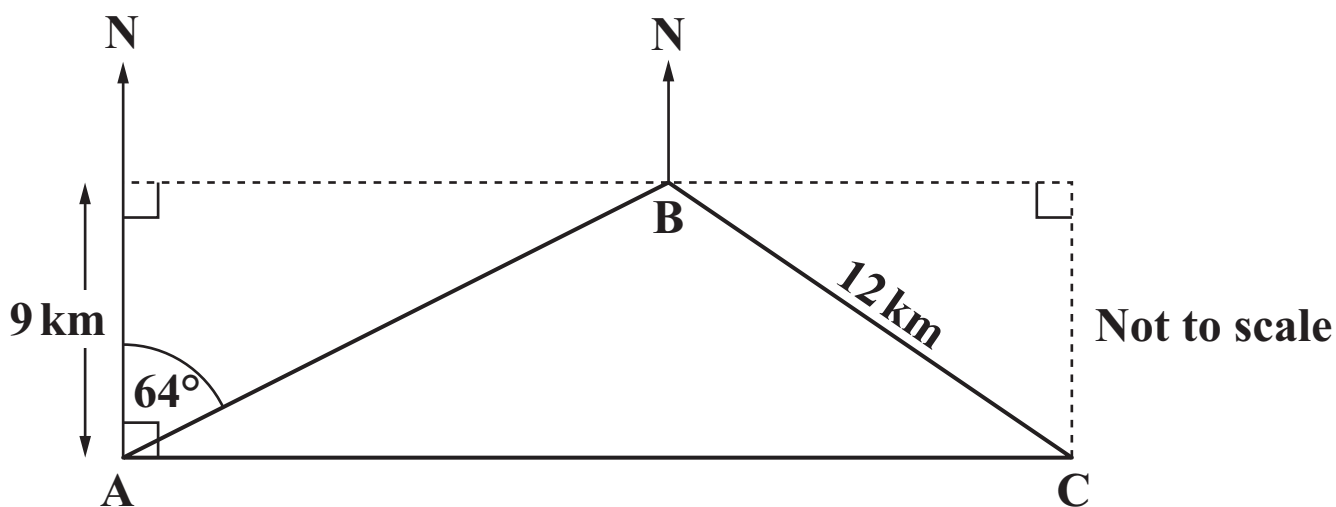
**(b) The graph shows the monthly bills.**

**Plot the moving averages.**



**[2]**

- 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, where C is due East of A.**

**On what bearing does he sail?**

**(b) \_\_\_\_\_° [3]**



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