



# M8

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

## B278A

Candidates answer on the question paper.

**OCR supplied materials:**  
None

**Other materials required:**

- Geometrical instruments
- Tracing paper (optional)

**Tuesday 21 June 2011**  
**Afternoon**

**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, 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**

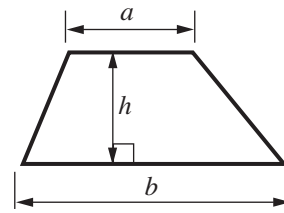
- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

**WARNING**

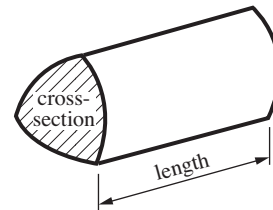
**No calculator can be used for Section A of this paper**

## Formulae Sheet

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



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

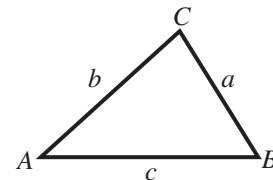


**In any triangle  $ABC$**

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

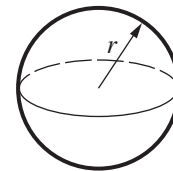
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



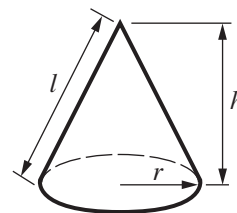
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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

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- 1 (a) Rearrange this equation to make  $x$  the subject.

$$6x - y = 4x + 1$$

(a) ..... [2]

- (b) (i) Solve this equation.

$$\frac{7x + 3}{2} = 2x + 1$$

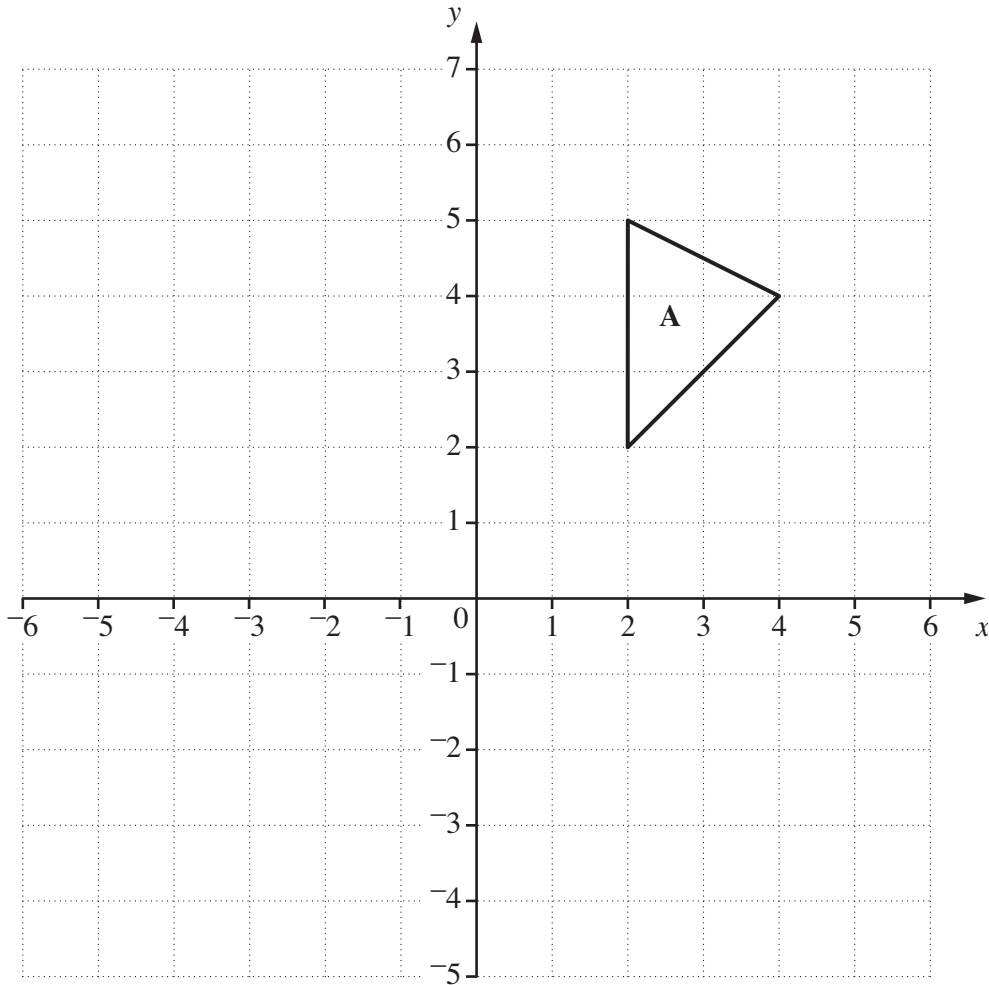
(b)(i) ..... [3]

- (ii) Factorise and solve this equation.

$$x^2 + 4x - 21 = 0$$

(ii) ..... [3]

2



(a) Rotate triangle **A** through  $90^\circ$  anti-clockwise about  $(1, 1)$ .  
Label the image **B**. [2]

(b) Translate triangle **B** using the vector  $\begin{pmatrix} -1 \\ -5 \end{pmatrix}$ .  
Label the image **C**. [2]

(c) Complete this description.

The **single** transformation that maps triangle **C** onto triangle **A** is  
a rotation  $90^\circ$  clockwise about ( ..... , .....). [1]

3 Work out.

$$2\frac{1}{2} \times 3\frac{2}{3}$$

..... [3]

4 Solve algebraically.

$$\begin{aligned} 5x + 2y &= 4 \\ 3x - 5y &= 21 \end{aligned}$$

$x =$  .....

$y =$  ..... [4]

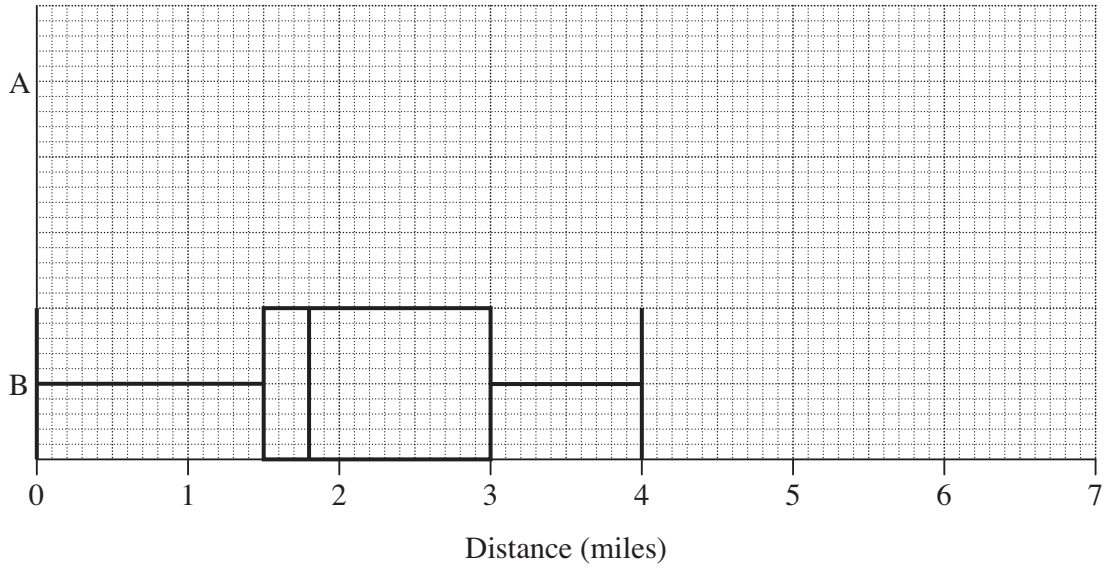
**TURN OVER FOR QUESTION 5**

- 5 Jim conducts a survey in two schools.  
He records the distance, in miles, each pupil travels to school.  
The results for school A are summarised in this table.

Minimum	Lower quartile	Median	Upper quartile	Range
0.5	1.5	2.5	4.2	5.5

The results for school B are shown in the box plot.

- (a) Draw the box plot for school A.



- (b) Write down the median distance for school B.

[2]

(b) ..... miles [1]

- (c) Write two comments comparing the distributions of the distances travelled by pupils in these two schools.

1 .....

.....

.....

2 .....

.....

..... [2]

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