

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

**B278A**

Candidates answer on the question paper

**OCR Supplied Materials:**

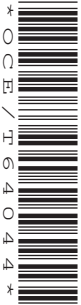
None

**Other Materials Required:**

- Geometrical instruments
- Tracing paper (optional)

**Tuesday 23 June 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.

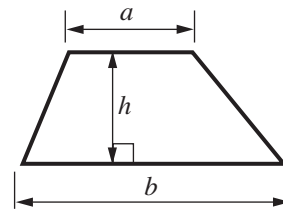
**WARNING**



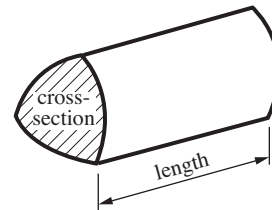
**No calculator can be used for Section A of this paper**

## Formulae Sheet

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



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

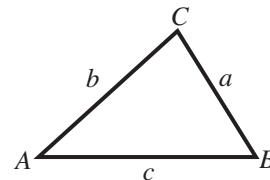


**In any triangle  $ABC$**

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

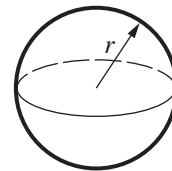
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



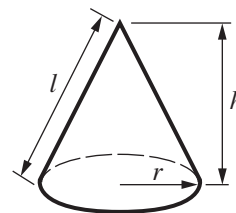
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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



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

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



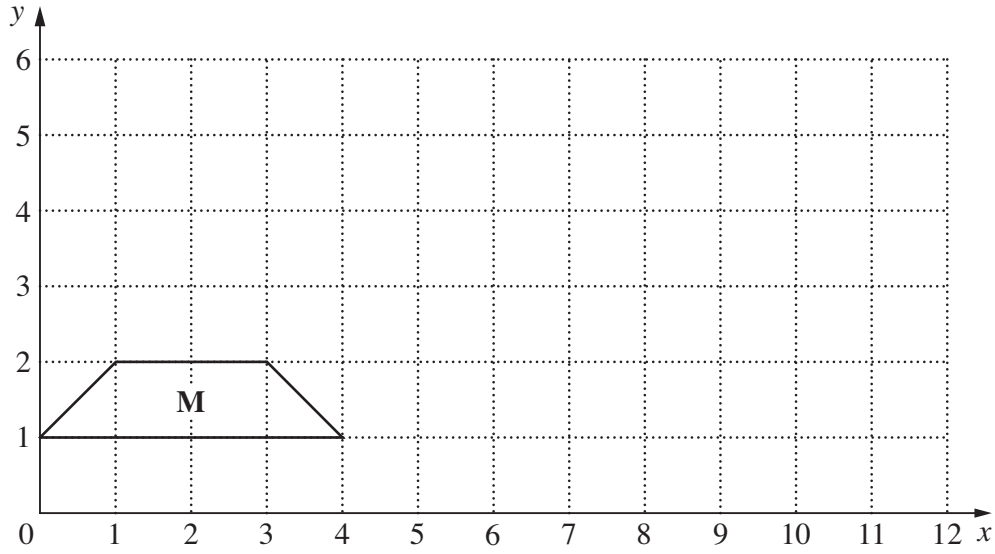
**The Quadratic Equation**

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**

1



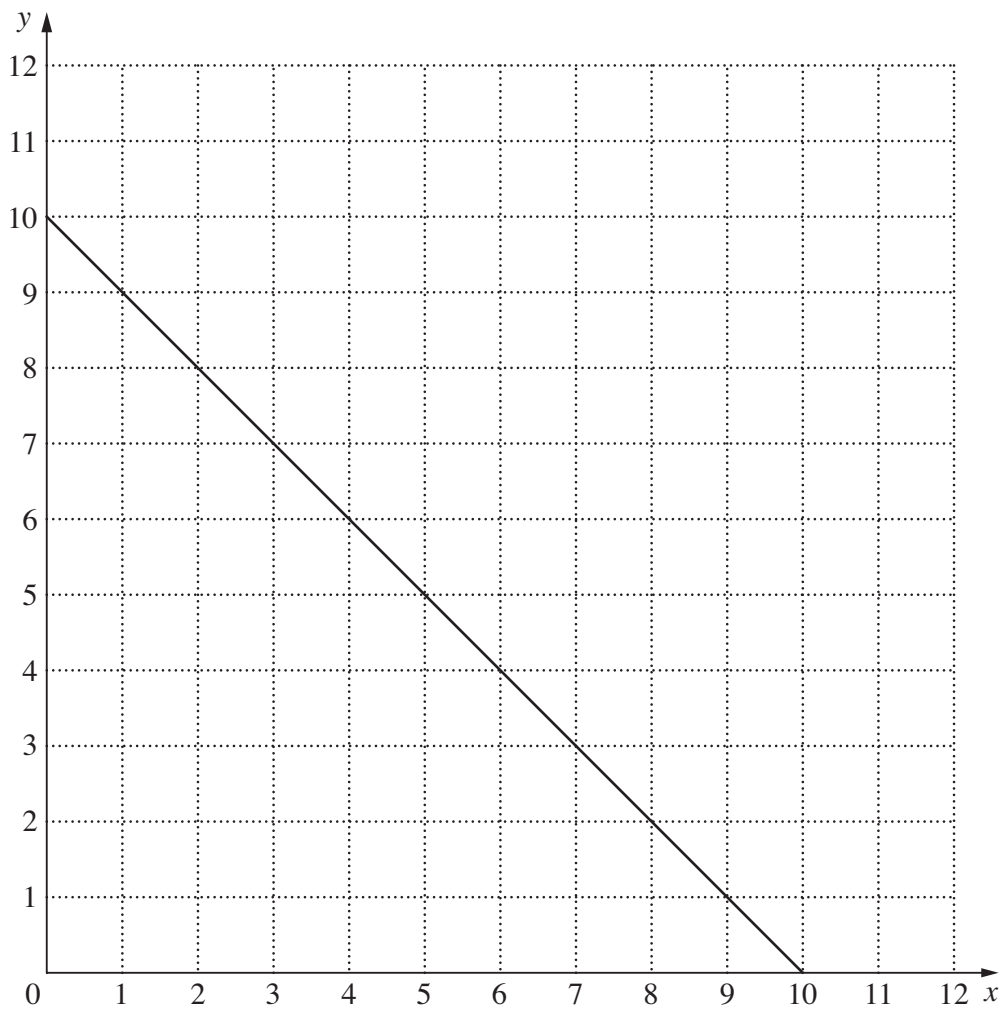
(a) Enlarge trapezium **M**, using scale factor 2.5 and centre of enlargement (0, 0).  
Label the image **N**. [2]

(b) The perimeter of **M** is 8.8 cm correct to 2 significant figures.

Without measuring, work out the perimeter of **N**.

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

2 The line  $y = 10 - x$  is drawn on the grid below.



(a) On the same grid, draw the graphs of

(i)  $x = 1$ ,

[1]

(ii)  $y = x + 2$ .

[1]

(b) Shade the region on the grid which satisfies all these three inequalities.

$$y \leq 10 - x$$

$$x \geq 1$$

$$y \leq x + 2$$

Label the region R.

[2]

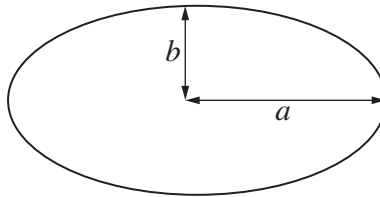
3 Work out.

$$2\frac{1}{3} + 4\frac{2}{5}$$

Write your answer as a mixed number.

..... [3]

4 This diagram shows an ellipse.



One of these expressions gives the area of the ellipse.

$$\pi(ab)^2 \quad \pi ab \quad \pi(a + b) \quad \pi a^2 b \quad \pi ab^2$$

Which is the correct expression?

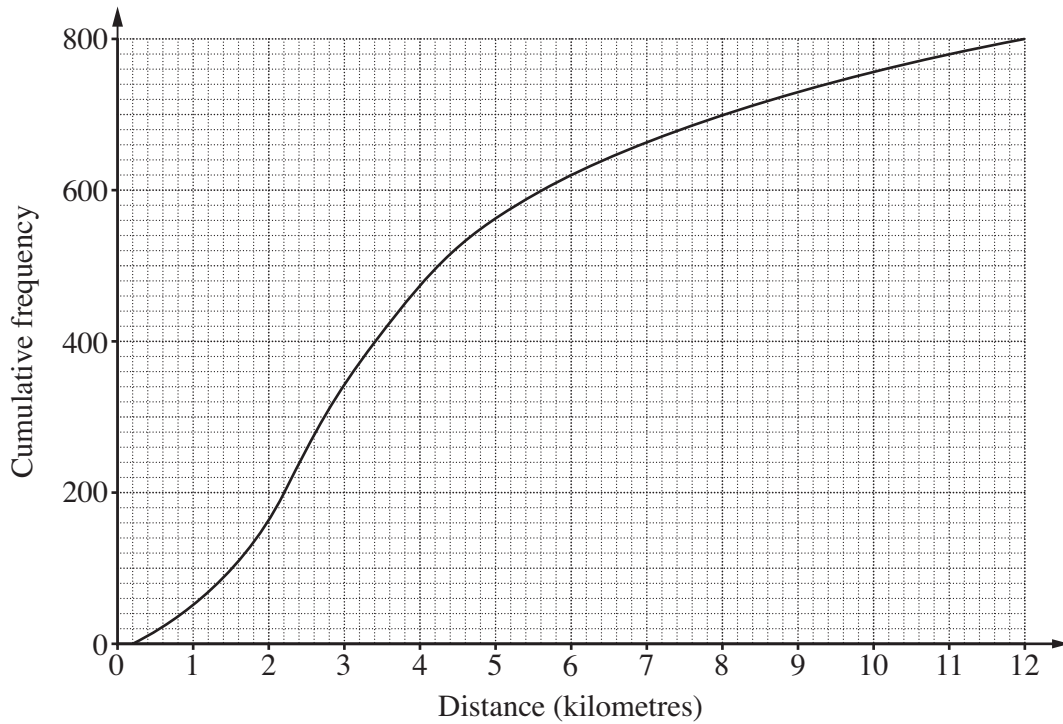
Use dimensions to explain your answer.

..... because .....

.....

..... [2]

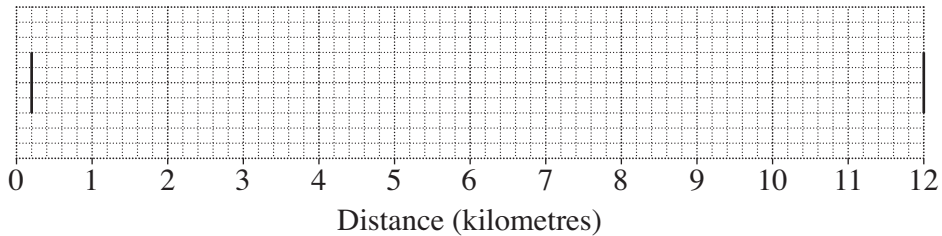
- 5 This cumulative frequency graph shows the distribution of the distances that students travel to Beeches School.



- (a) What is the median distance travelled?

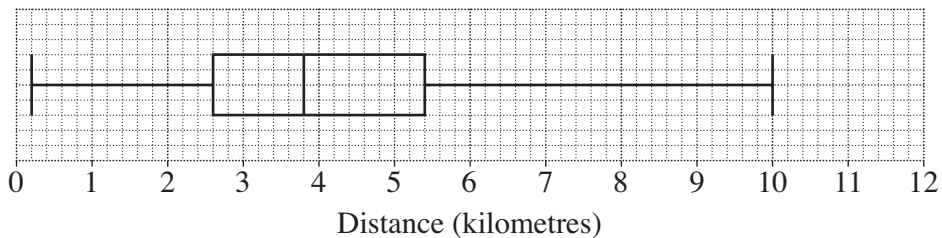
(a) ..... km [1]

- (b) Complete the box plot to show the distribution of the distances that students travel to Beeches School.



[2]

This box plot shows the distribution of the distances that students travel to Highlands School.



(c) Make two comments comparing the distributions of the distances travelled to the two schools.

1 .....

.....

2 .....

..... [2]

6 This table shows the areas of four South American countries.

Country	Area
Argentina	$2.8 \times 10^6 \text{ km}^2$
Brazil	$8.5 \times 10^6 \text{ km}^2$
Ecuador	$4.6 \times 10^5 \text{ km}^2$
Paraguay	$4.1 \times 10^5 \text{ km}^2$

(a) List the countries in order of area, smallest first.

..... [1]

(b) The total area of South America is  $17\,840\,000 \text{ km}^2$ .

Write this area in standard form, correct to 2 significant figures.

(b) .....  $\text{km}^2$  [2]

(c) Complete this sentence.

The area of Brazil is about ..... times the area of Paraguay.

[1]

**TURN OVER FOR QUESTION 7**

7 Solve by factorisation.

$$x^2 + x - 20 = 0$$

..... [3]



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