OCR
RECOGNISING ACHIEVEMENT

M8

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C (GRADUATED ASSESSMENT) B278A

MODULE M8 – SECTION A

OCE/T64044

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

B278A

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

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

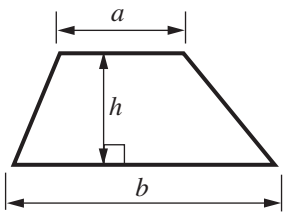
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

WARNING

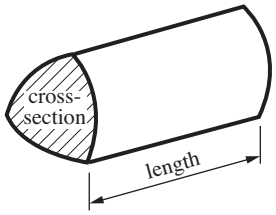
No calculator can be used for Section A of this paper

Formulae Sheet

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



Volume of prism = (area of cross-section) × length

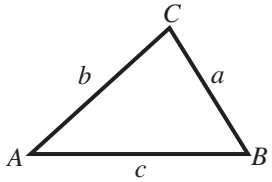


In any triangle ABC

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

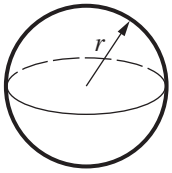
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



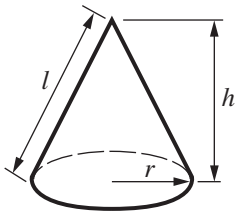
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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



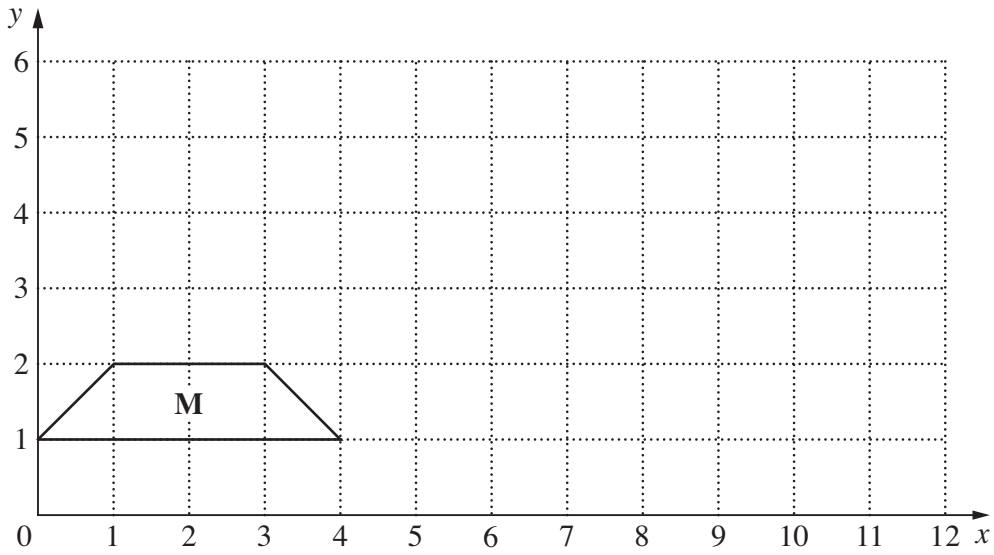
The Quadratic Equation

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



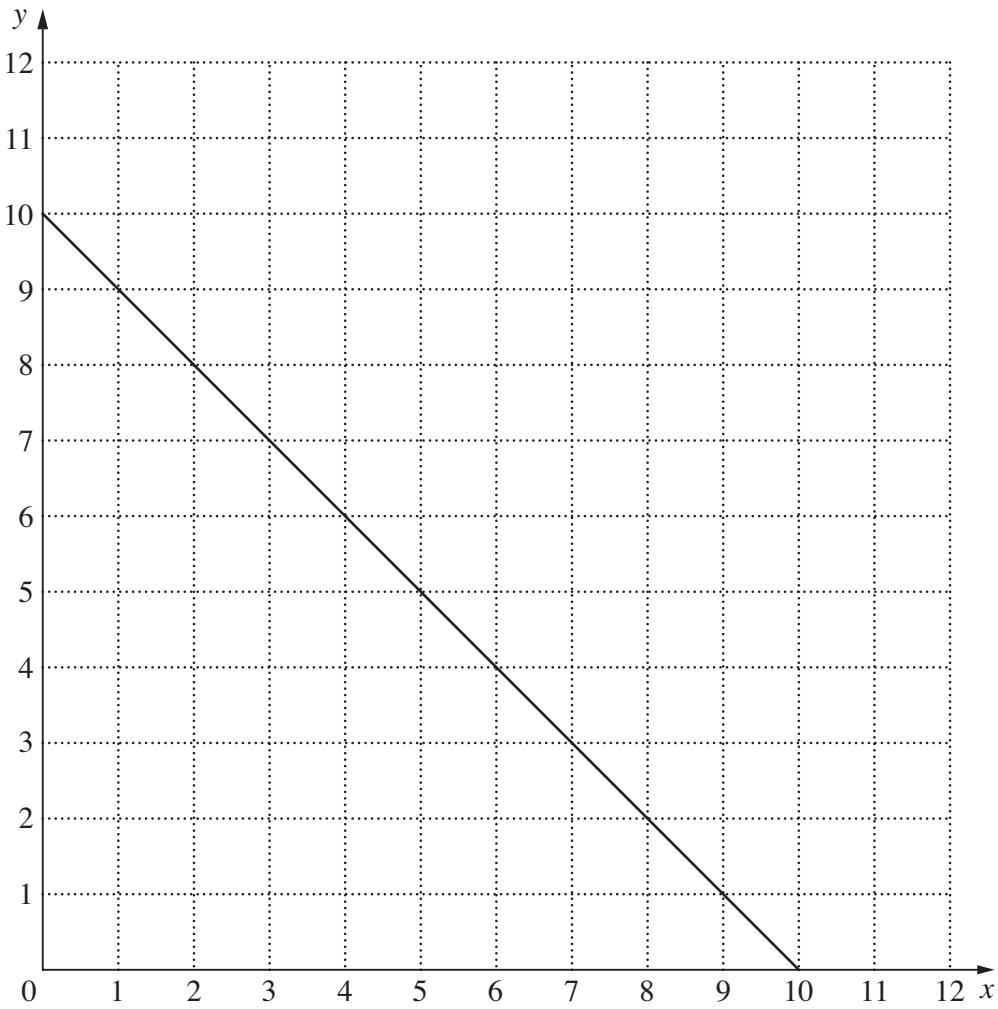
(a) Enlarge trapezium **M**, using scale factor 2·5 and centre of enlargement (0, 0). Label the image **N**. **[2]**

(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.

$$y \leqslant 10 - x \qquad x \geqslant 1 \qquad y \leqslant x + 2$$

Label the region R. **[2]**

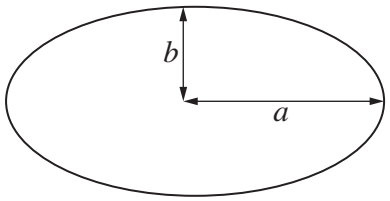
3 Work out.

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

Write your answer as a mixed number.

..... **[3]**

4 This diagram shows an ellipse.



One of these expressions gives the area of the ellipse.

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

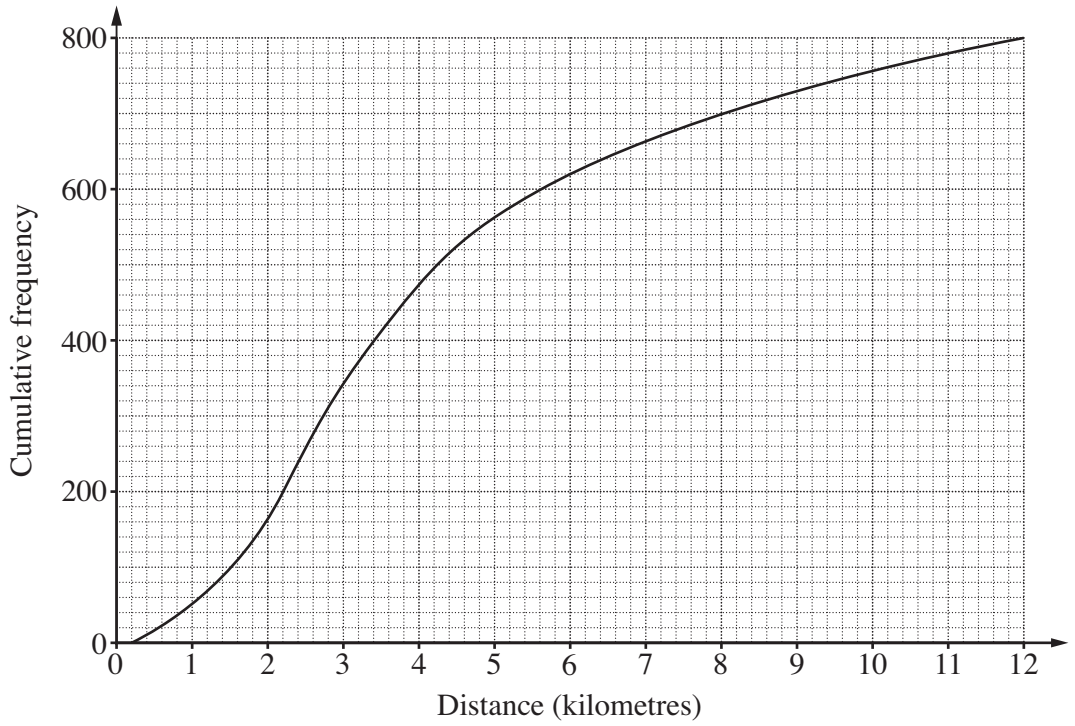
Which is the correct expression?
Use dimensions to explain your answer.

..... because .....

.....

..... **[2]**

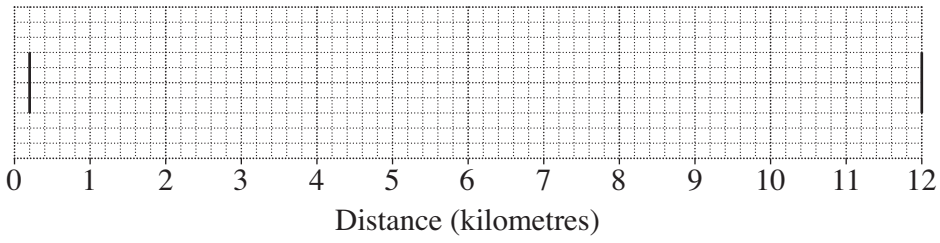
5 This cumulative frequency graph shows the distribution of the distances that students travel to Beeches School.



(a) What is the median distance travelled?

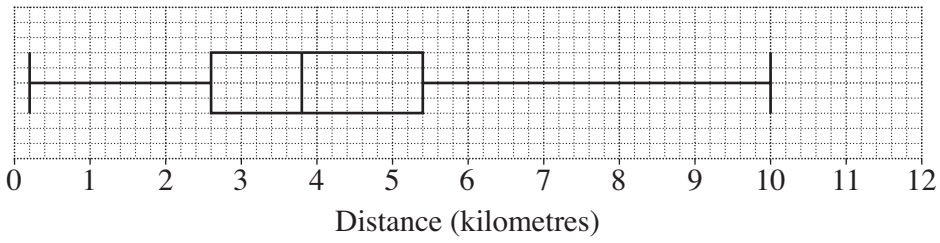
(a) ..... km **[1]**

(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	$2{\cdot}8 \times 10^6$ km^2
Brazil	$8{\cdot}5 \times 10^6$ km^2
Ecuador	$4{\cdot}6 \times 10^5$ km^2
Paraguay	$4{\cdot}1 \times 10^5$ km^2

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

..... **[1]**

(b) The total area of South America is 17 840 000 km^2.

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

(b) ..... 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]**