Candidate Forename		Candidate Surname	

Centre Number					Candidate Number				

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION

B278A

MATHEMATICS C
(GRADUATED ASSESSMENT)

MODULE M8 – SECTION A

TUESDAY 23 JUNE 2009: Morning
DURATION: 30 minutes

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the question paper.

<u>OCR SUPPLIED MATERIALS:</u>

None

<u>OTHER MATERIALS REQUIRED:</u>

Geometrical instruments
Tracing paper (optional)

<div style="border:1px solid">

WARNING
No calculator can be used for
Section A of this paper.

</div>

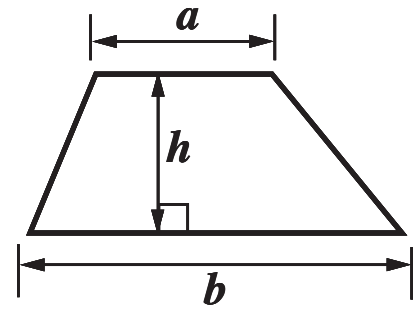## <u>READ INSTRUCTIONS OVERLEAF</u>

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.

- 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 <u>ALL</u> the questions.

- Write your answer to each question in the space provided, however additional paper may be used if necessary.
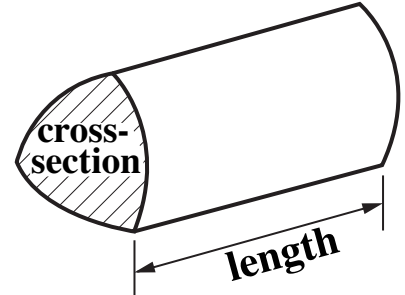
INFORMATION FOR CANDIDATES

- 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 <u>25</u>.

FORMULAE SHEET

Area of trapezium $= \frac{1}{2}(a+b)h$
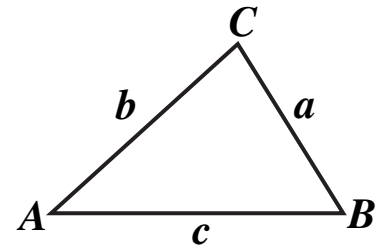
Volume of prism = (area of cross-section) × length

In any triangle ABC

Sine rule $\quad \dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$
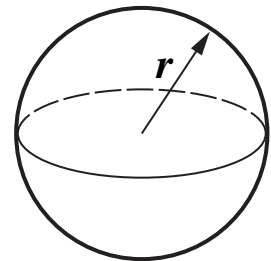
Cosine rule $\quad a^2 = b^2 + c^2 - 2bc \cos A$

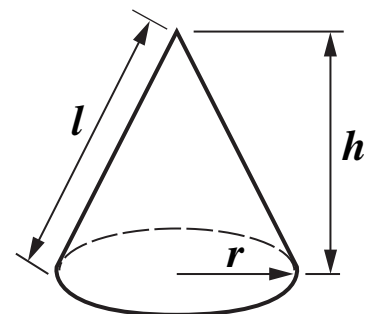**Area of triangle** $= \frac{1}{2} ab \sin C$

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

Surface area of sphere $= 4\pi r^2$
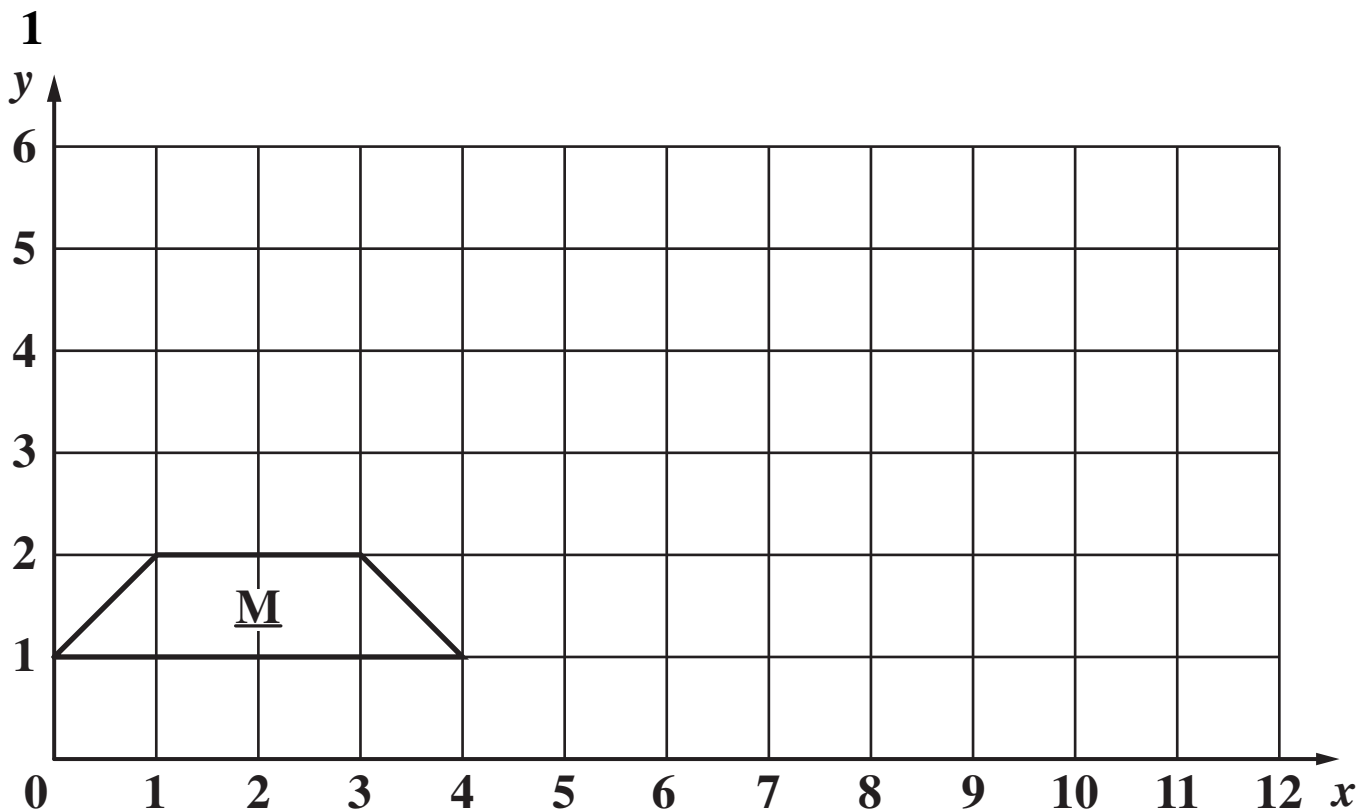
Volume of cone $= \frac{1}{3}\pi r^2 h$

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

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$
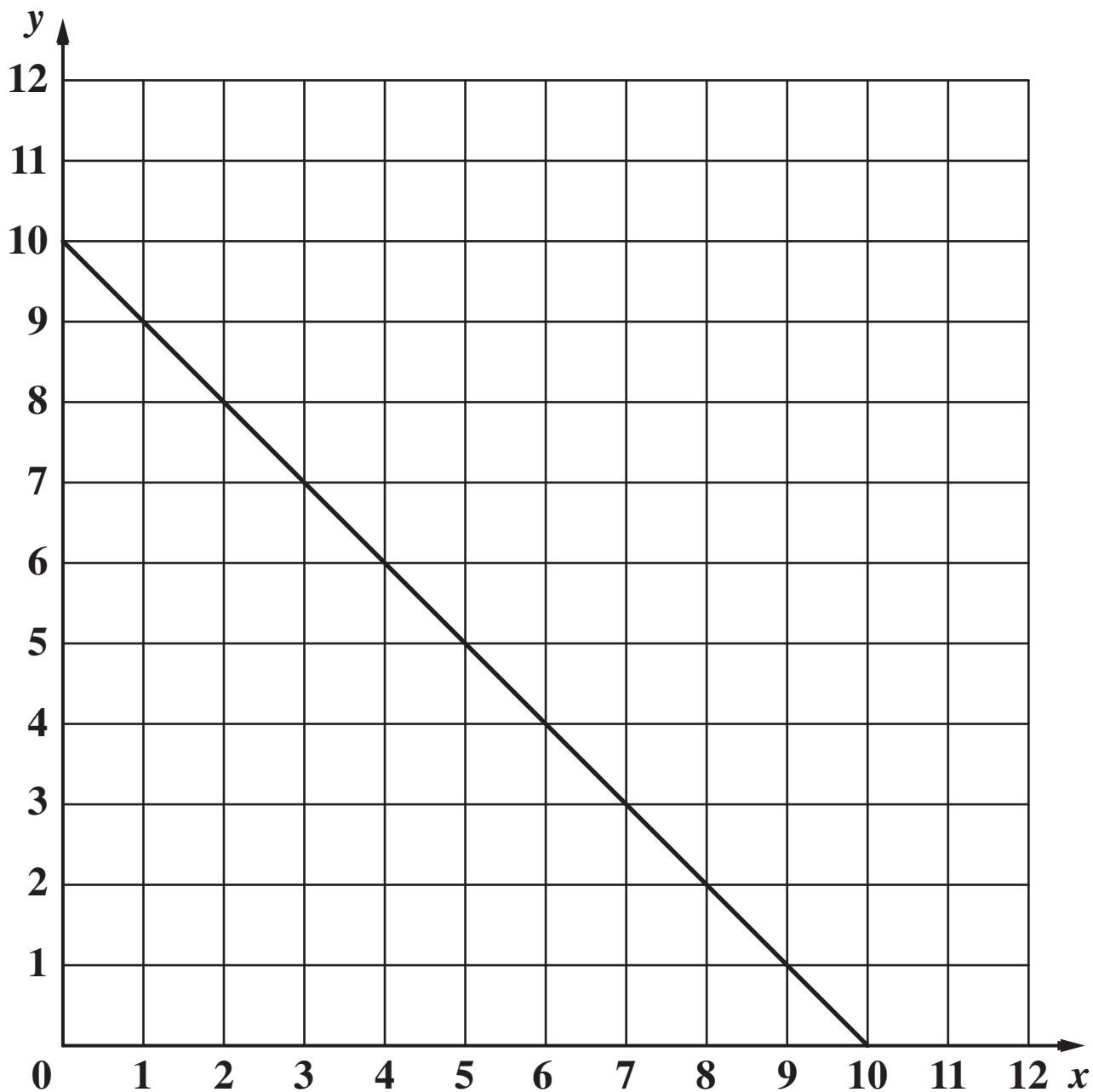
(a) Enlarge trapezium **M**, using scale factor 2·5 and centre of enlargement (0, 0).
Label the image **N**.
[2 marks]

(b) The perimeter of **M** is 8·8 cm correct to 2 significant figures.

Without measuring, work out the perimeter of **N**.
[2 marks]

(b) _____ cm

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 mark]

    (ii) $y = x + 2$.
      [1 mark]

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

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

Label the region R.
[2 marks]

3 **Work out.**

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

Write your answer as a mixed number.
[3 marks]

_____

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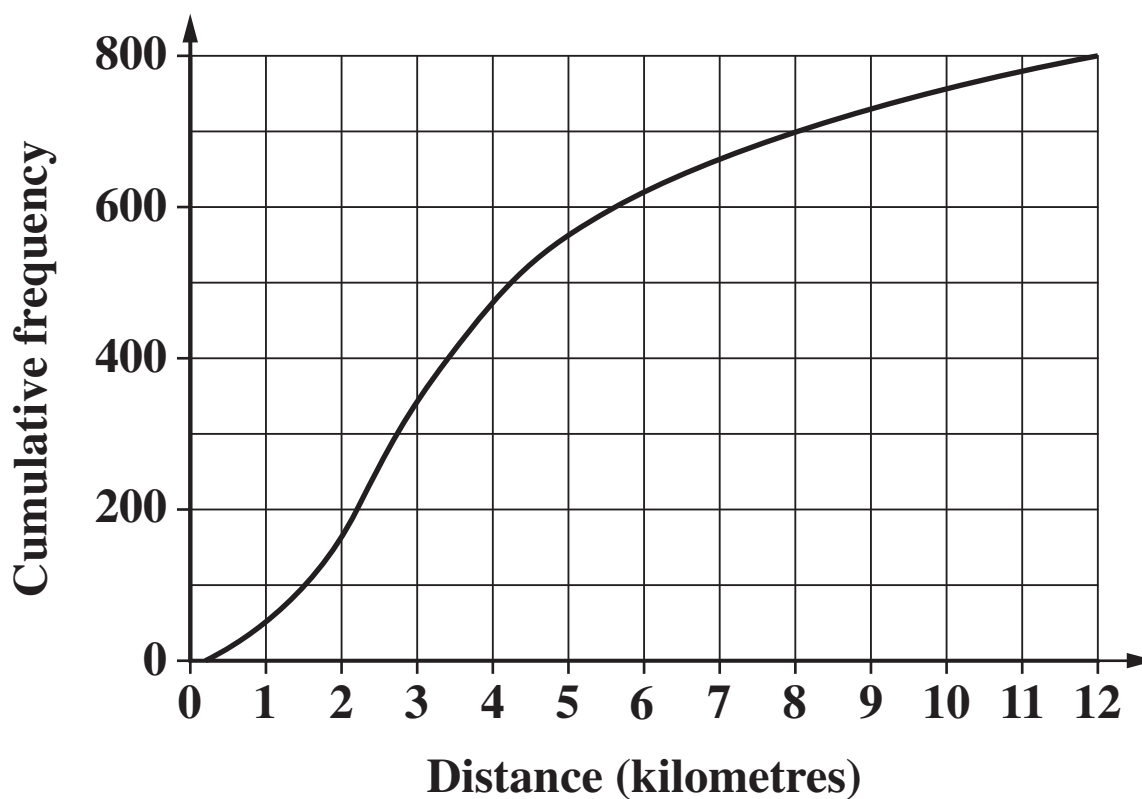
Which is the correct expression?
Use dimensions to explain your answer.
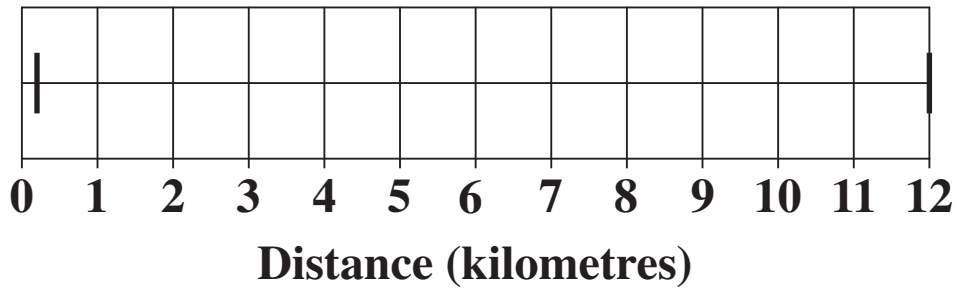
_____ **because** _____

_____

_____

[2 marks]

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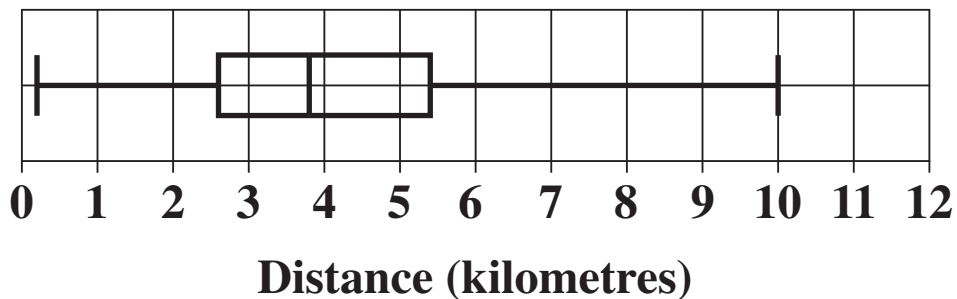

(a) What is the median distance travelled?
[1 mark]

(a) _____ km

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

Distance (kilometres)

0 1 2 3 4 5 6 7 8 9 10 11 12

[2 marks]

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

Distance (kilometres)

0 1 2 3 4 5 6 7 8 9 10 11 12

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

1 _____

_____

2 _____

_____

[2 marks]

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 mark]

_____

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

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

(b) _____ km^2

(c) Complete this sentence.

The area of Brazil is about _____

times the area of Paraguay.

[1 mark]

7 **Solve by factorisation.**

$x^2 + x - 20 = 0$

_____

[3 marks]

OCR

RECOGNISING ACHIEVEMENT