

Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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**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.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Geometrical instruments

Tracing paper (optional)

WARNING

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

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

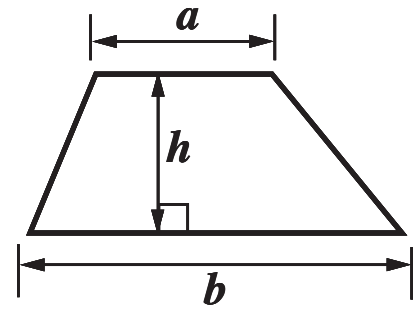
- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided, however additional paper may be used if necessary.**

INFORMATION FOR CANDIDATES

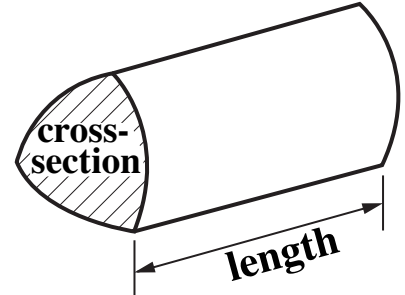
- **The number of marks is given in brackets [] at the end of each question or part question.**
- **The total number of marks for this Section is 25.**

FORMULAE SHEET

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



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

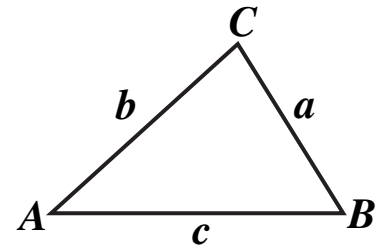


In any triangle ABC

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

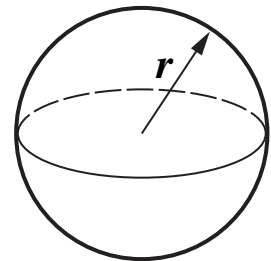
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



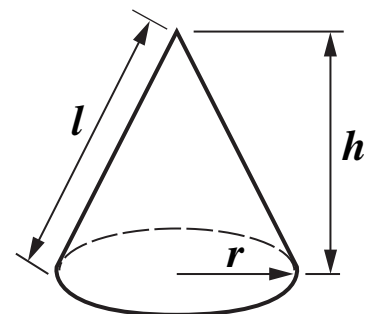
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

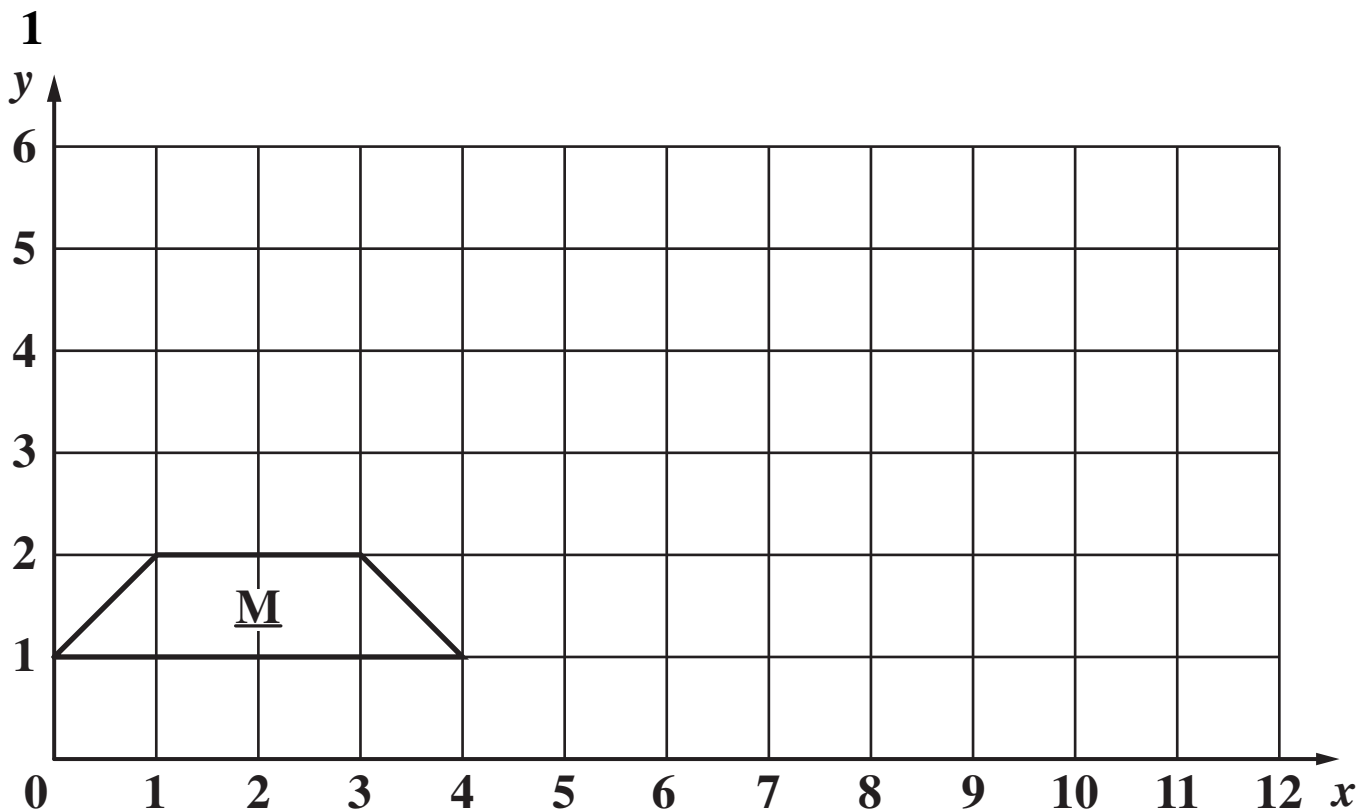
Curved surface area of cone = $\pi r l$



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

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



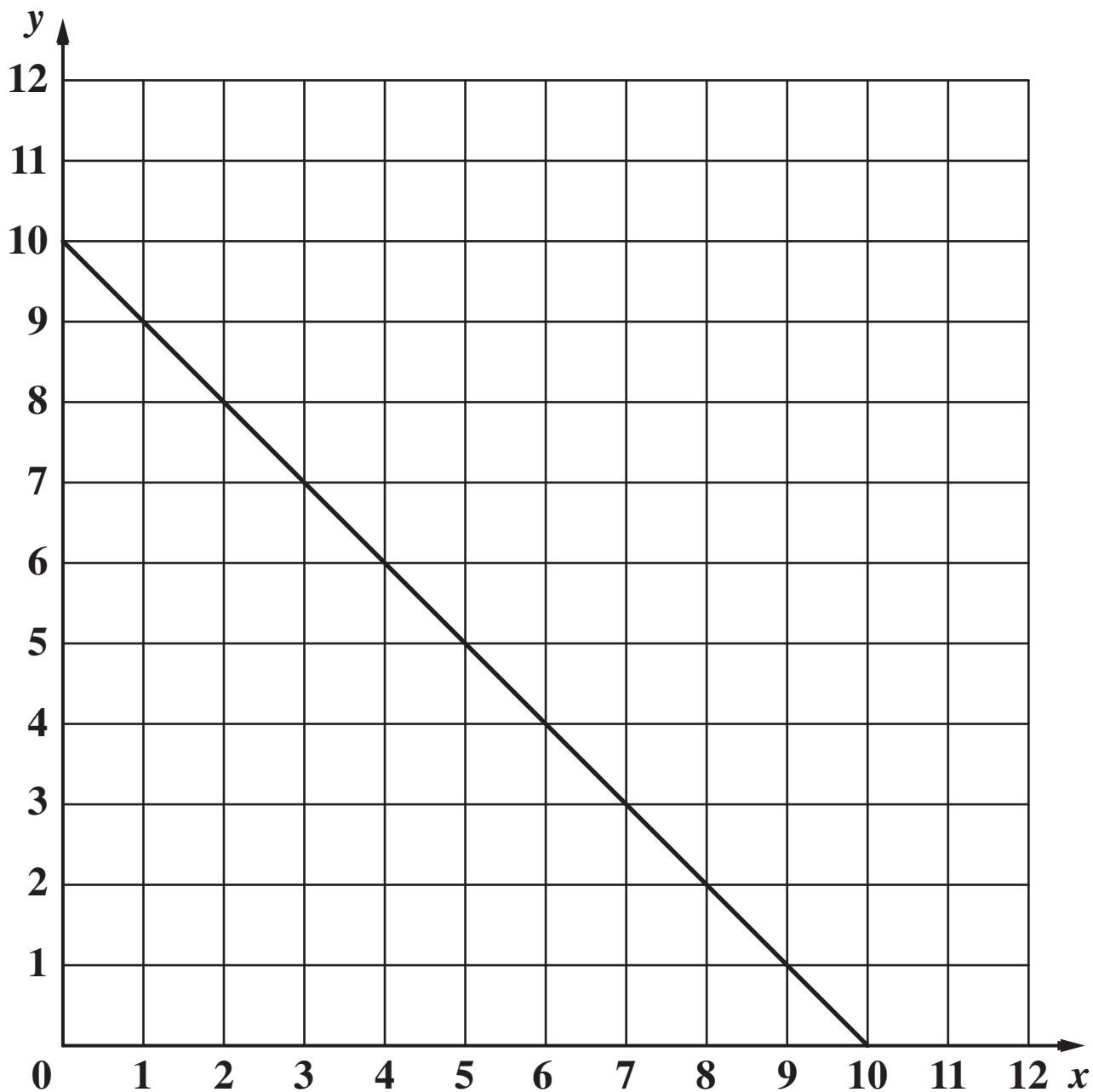
(a) Enlarge trapezium **M**, using scale factor **2.5** and centre of enlargement **(0, 0)**.
 Label the image **N**.
 [2 marks]

(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.

$$y \leq 10 - x$$

$$x \geq 1$$

$$y \leq x + 2$$

Label the region R.

[2 marks]

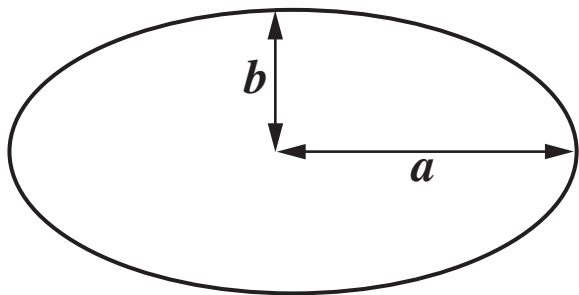
3 Work out.

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

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

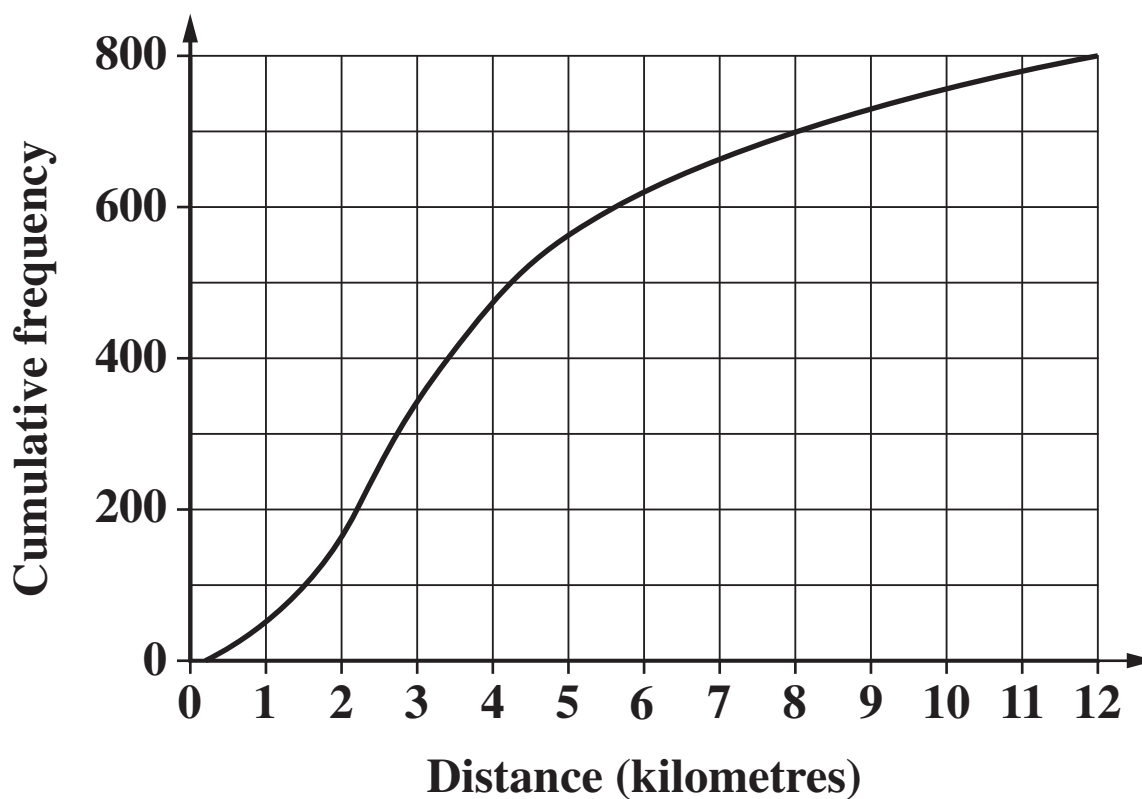
Which is the correct expression?

Use dimensions to explain your answer.

_____ because _____

[2 marks]

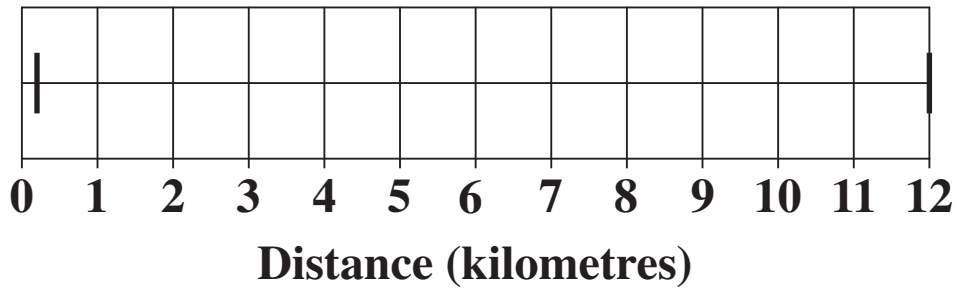
- 5 This cumulative frequency graph shows the distribution of the distances that students travel to Beeches School.



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

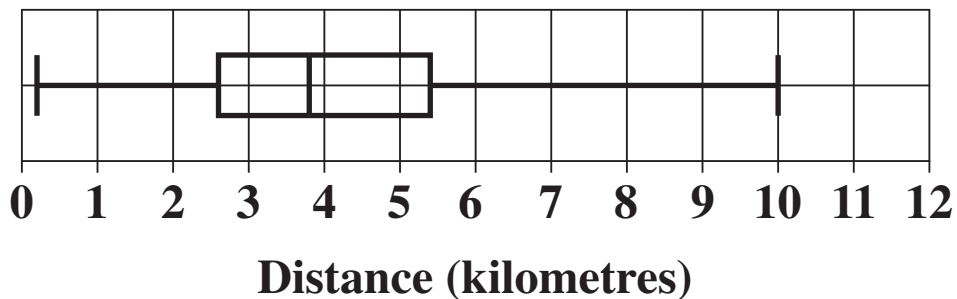
(a) _____ km

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



[2 marks]

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 marks]

- 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 mark]
-

- (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.
[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]



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