

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**

B279B

**MATHEMATICS C
(GRADUATED ASSESSMENT)**

MODULE M9 – SECTION B

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)

Scientific or graphical calculator

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.

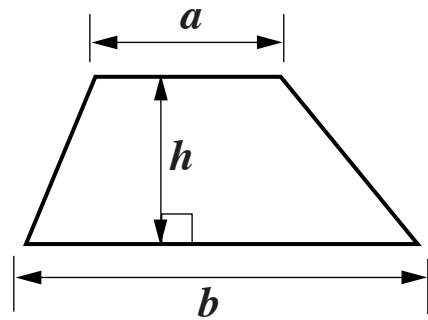
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- Section B starts with question 6.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total number of marks for this Section is 25.

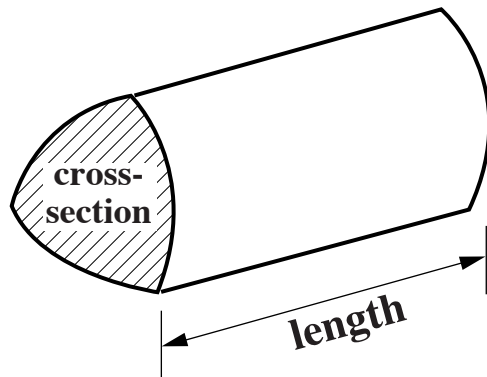
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FORMULAE SHEET

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



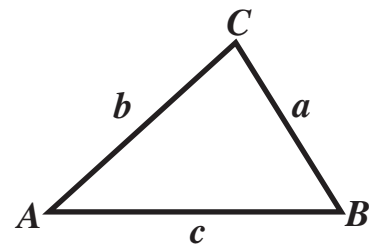
Volume of prism =
(area of cross-section) \times length



In any triangle ABC

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

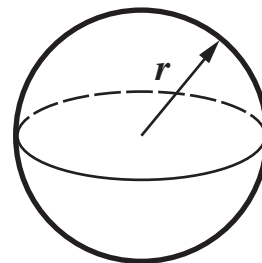
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$



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

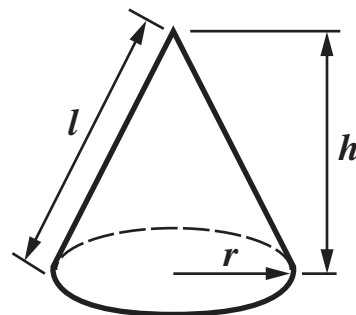
Volume of sphere = $\frac{4}{3}\pi r^3$

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

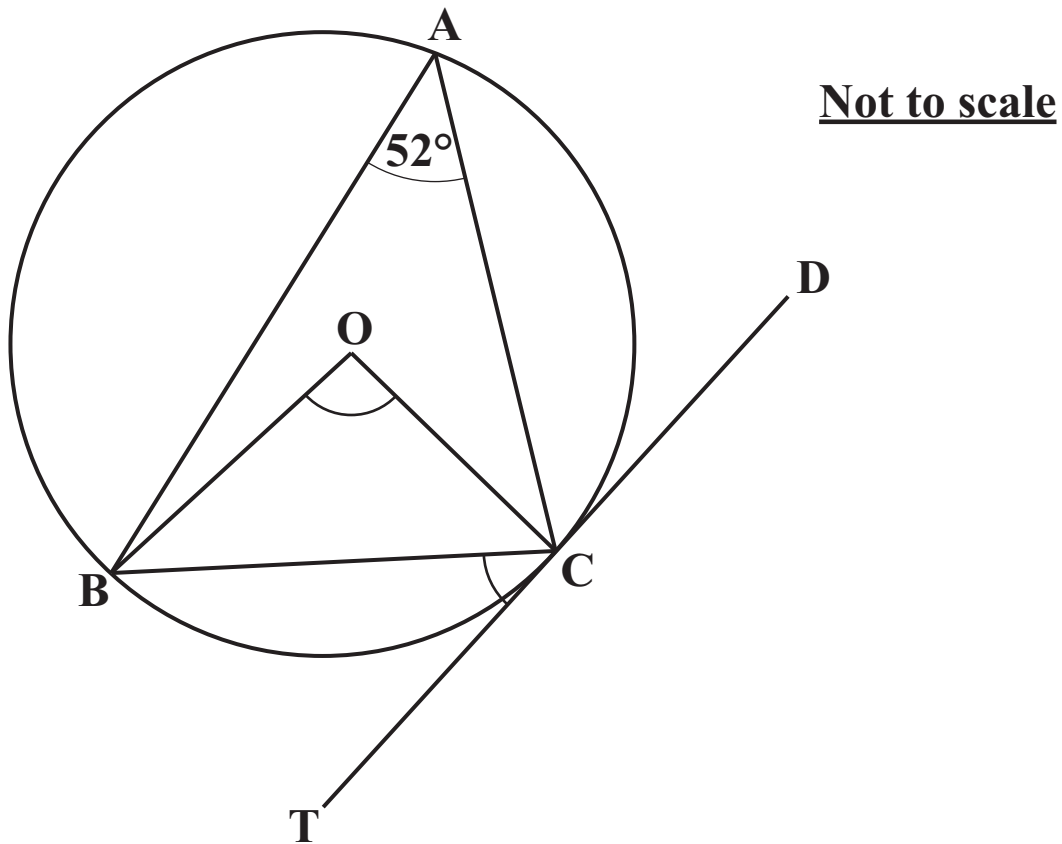
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

6 Rearrange this formula to make x the subject.

$$y = 8x^3$$

[2 marks]

- 7 A, B and C are points on a circle, centre O.
 TCD is a tangent to the circle.
 Angle BAC = 52° .



Find angles BOC and BCT, giving your reasons.

Angle BOC = _____ $^\circ$ because _____

[2 marks]

Angle BCT = _____ $^\circ$ because _____

[2 marks]

8 Serena wishes to select a random stratified representative sample of size 100 from her school of 750 students. There are 120 students in year 11, with 66 of these being girls.

**How many year 11 girls should be in Serena's sample?
[2 marks]**

9 Paul's computer on his bicycle shows that he has travelled 383 m to the nearest metre. The time he has taken is 43.7 seconds, correct to 1 decimal place.

(a) Explain why the result of the calculation $\frac{383.5}{43.65}$ gives the upper bound of Paul's mean speed in metres per second.

[2 marks]

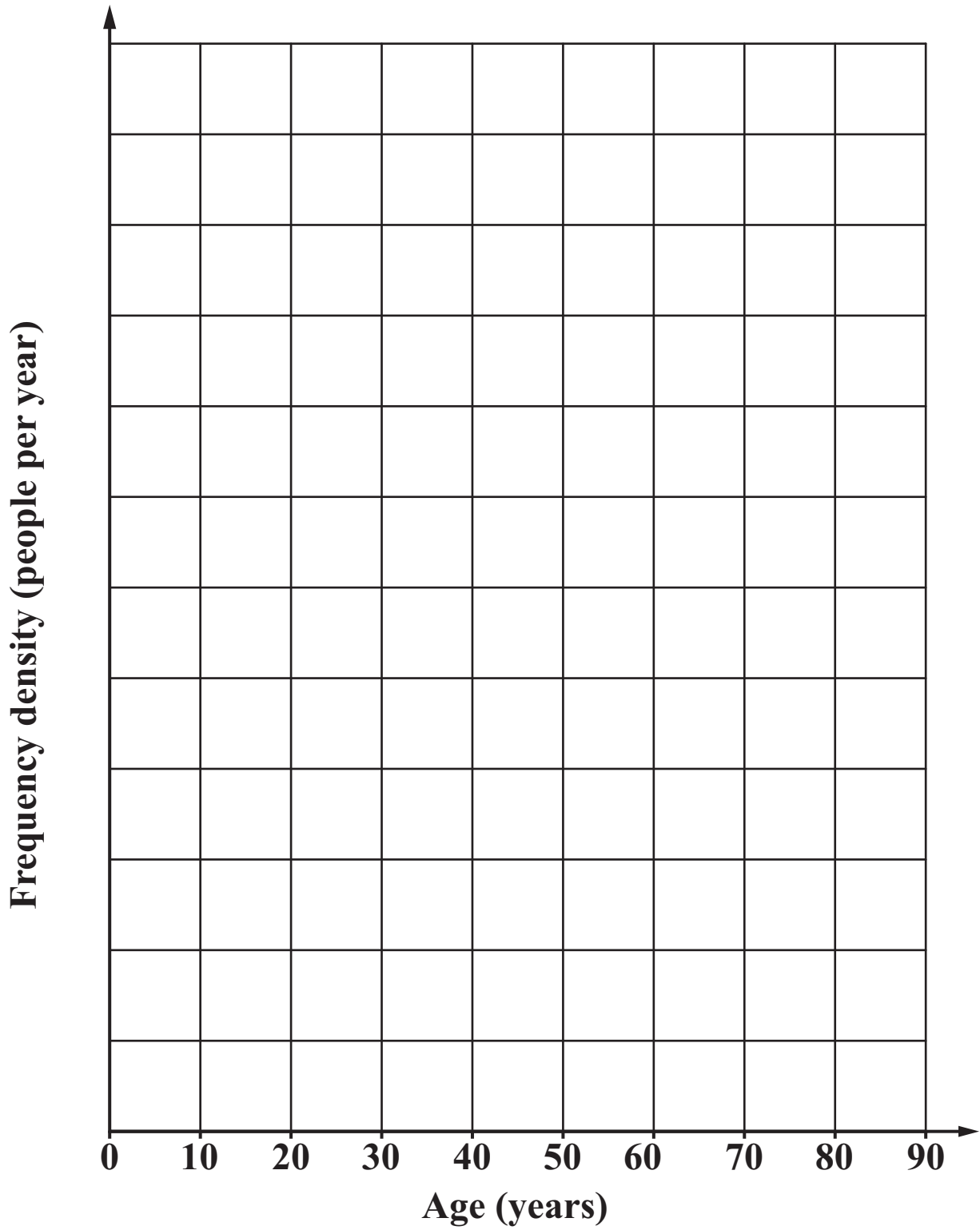
(b) Calculate the lower bound of Paul's mean speed. Give your answer correct to 2 decimal places.
[2 marks]

(b) _____ m/s

10 This table summarises the ages of the members of Parkview tennis club.

Age (x years)	Frequency
$5 \leq x < 10$	14
$10 \leq x < 20$	34
$20 \leq x < 40$	80
$40 \leq x < 60$	92
$60 \leq x < 90$	66

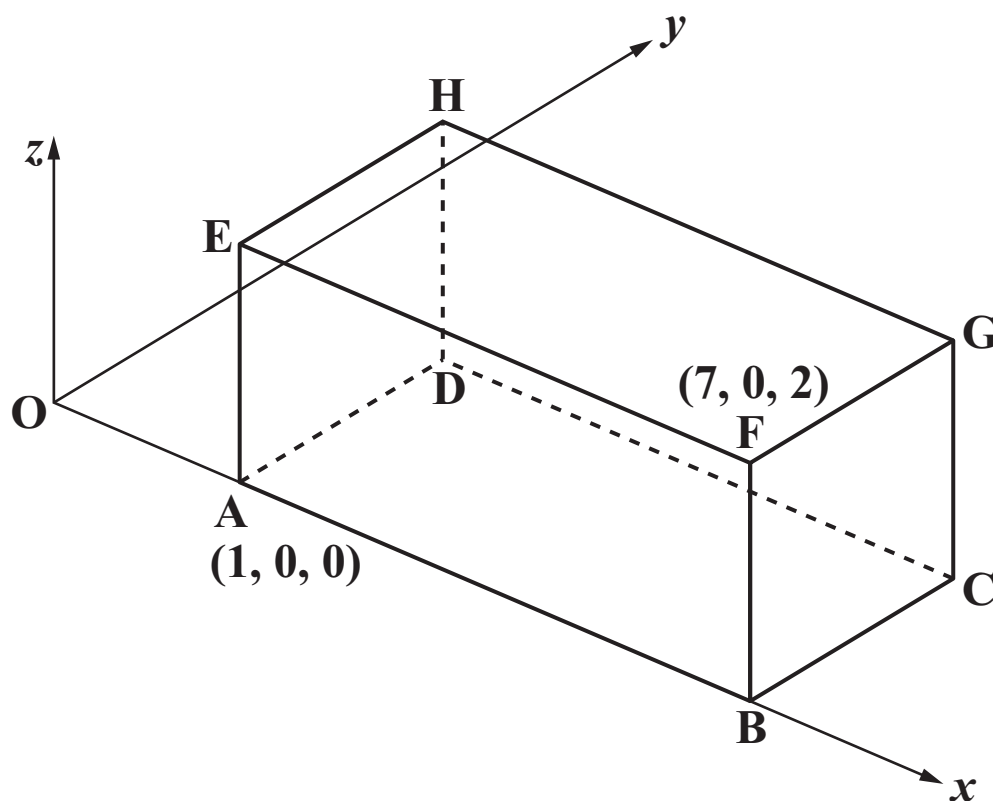
Draw a histogram to represent these data.



[3 marks]

11 ABCDEFGH is a cuboid with sides of length 6 units, 3 units and 2 units.

With coordinate axes as shown, A is the point $(1, 0, 0)$ and F is $(7, 0, 2)$.



(a) Find the coordinates of the midpoint of face EFGH.
[2 marks]

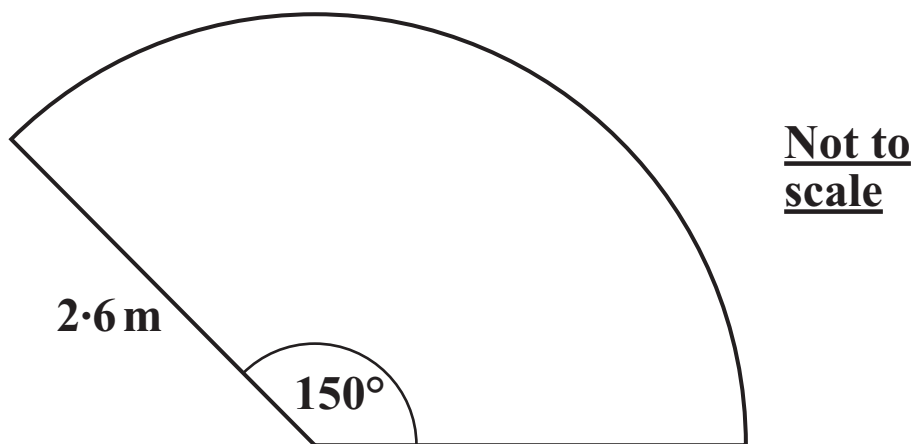
(a) (_____ , _____ , _____)

**(b) Calculate the length BH.
[2 marks]**

(b) _____ units

- 12 A flowerbed is a sector of a circle of radius 2.6 m.
The sector angle is 150° .

Calculate the area of the flowerbed.



[3 marks]

_____ m^2

**13 Two jugs are mathematically similar in shape.
The smaller one has height 11 cm and can hold 200 ml.
The larger one can hold 1 litre.**

**Calculate the height of the larger jug.
[3 marks]**

_____ **cm**



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