

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**

B279A

**MATHEMATICS C
(GRADUATED ASSESSMENT)**

MODULE M9 – SECTION A

THURSDAY 20 JANUARY 2011: 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

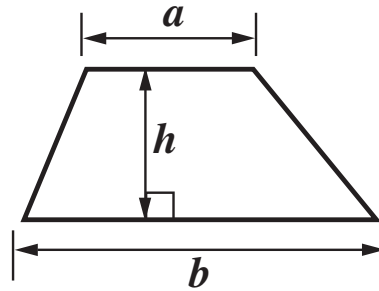
- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).**
- **Answer ALL the questions.**

INFORMATION FOR CANDIDATES

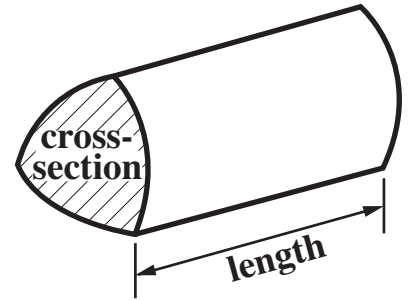
- **The number of marks is given in brackets [] at the end of each question or part question.**
- **The total number of marks for this Section is 25.**

FORMULAE SHEET

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



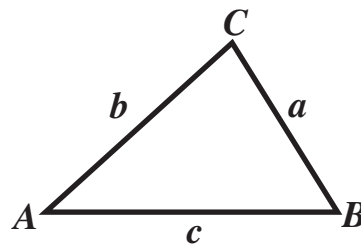
Volume of prism = (area of cross-section) \times length



In any triangle ABC

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

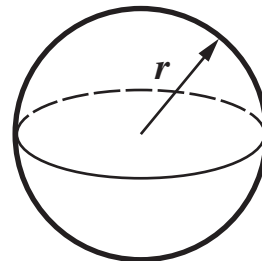
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$



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

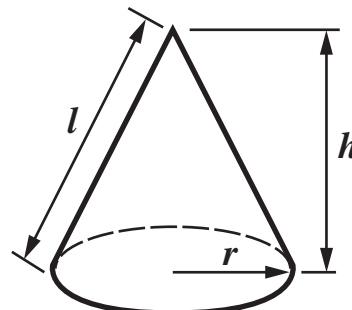
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

1 Evaluate.

(a) 25^0

(a) _____ [1]

(b) $25^{\frac{1}{2}}$

(b) _____ [1]

(c) $\left(\frac{2}{3}\right)^{-2}$

(c) _____ [2]

2 A molecule of water has mass 3×10^{-23} g.

**Calculate the mass of 5 million molecules of water.
Give your answer in standard form.**

_____ g [3]

3 (a) Expand and simplify.

$$(3x - 5)(2x + 1)$$

(a) _____ **[2]**

(b) Factorise.

$$x^2 - 25$$

(b) _____ **[1]**

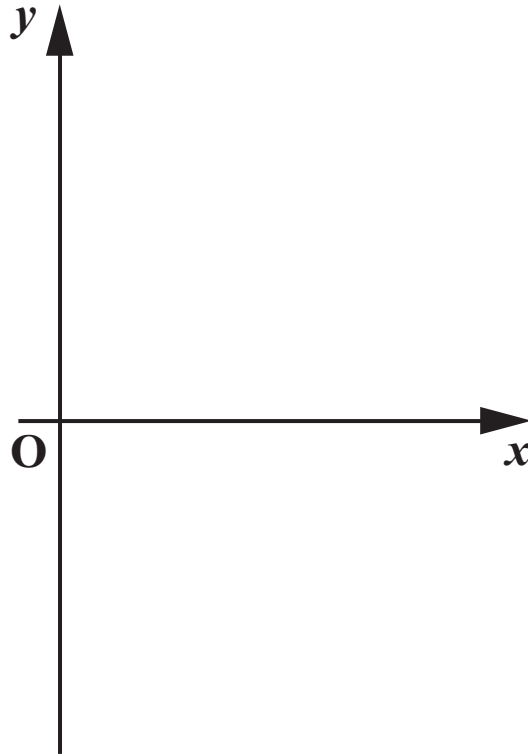
(c) Factorise and solve.

$$2x^2 - 7x + 6 = 0$$

(c) _____ [3]

4 You are given that $y \propto \frac{1}{x}$ and that $y = 6$ when $x = 5$.

(a) Sketch the shape of the graph representing this relationship, for positive values of x .



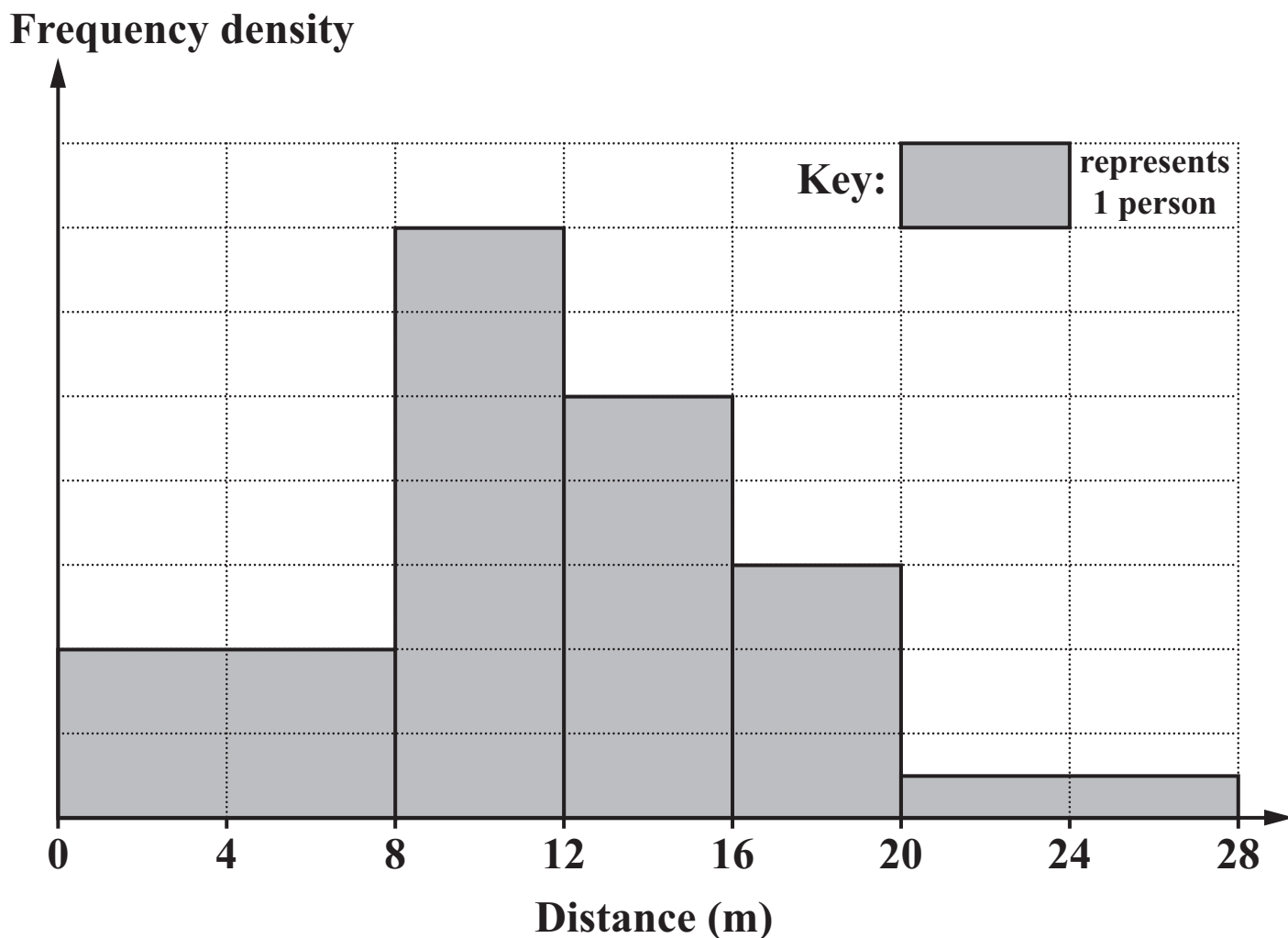
[1]

(b) Find the equation connecting y and x .

(b) _____ [3]

5 At a charity event, there was a welly-throwing competition.

(a) This histogram summarises the distances thrown by the girls.



How many girls threw the welly more than 16 metres?

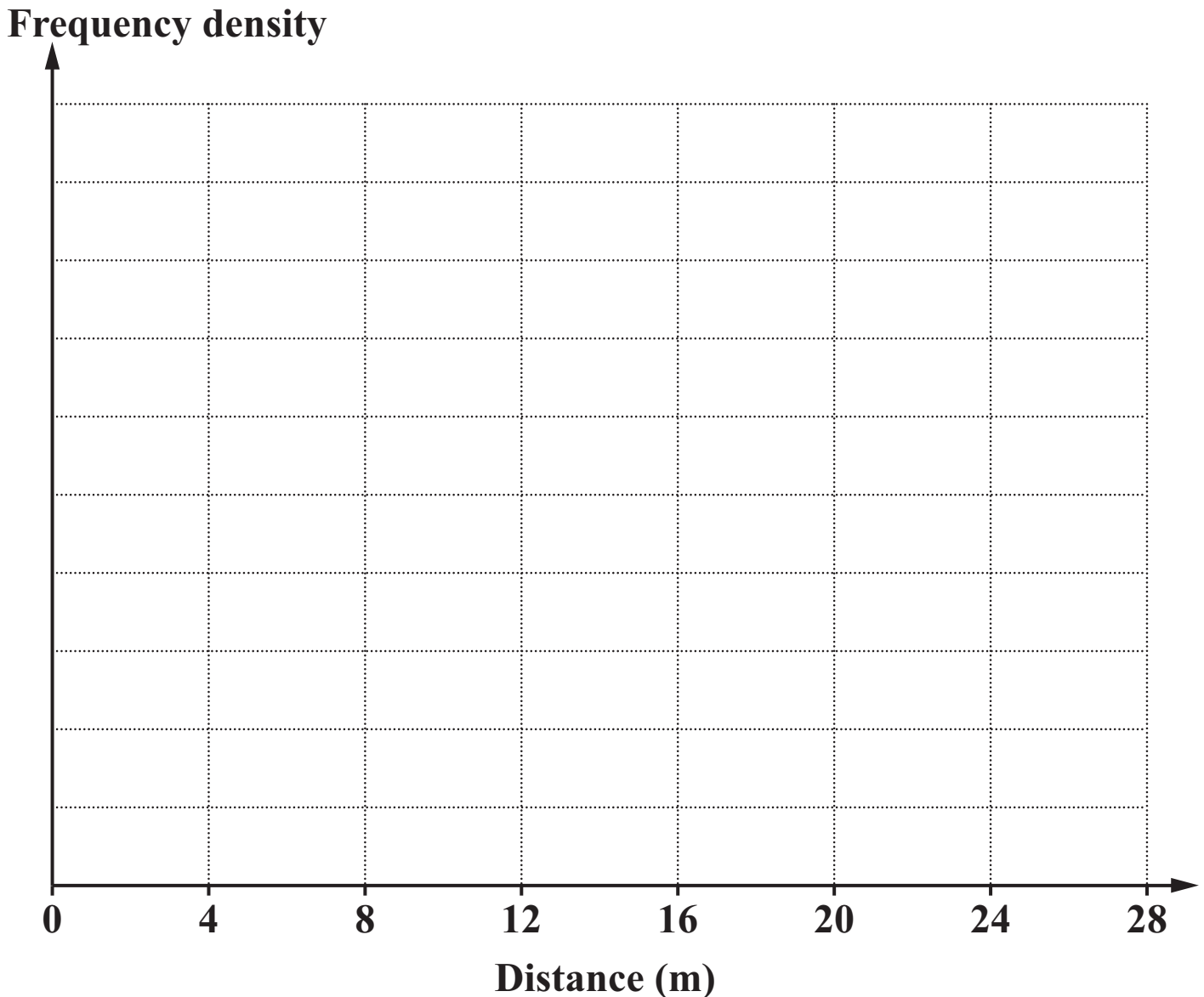
(a) _____ [1]

(b) This table summarises the distances thrown by the boys in the welly-throwing competition.

Distance (d m)	Frequency
$0 < d \leq 8$	2
$8 < d \leq 12$	6
$12 < d \leq 16$	9
$16 < d \leq 20$	4
$20 < d \leq 28$	3

On the grid below, construct a histogram to represent this information.

Use the same scale as the histogram in part (a).



6 A line has equation $y = 5x + 3$.

(a) Write down the equation of the line which is parallel to $y = 5x + 3$ and which passes through the point $(0, -4)$.

(a) _____ [2]

(b) Find the equation of the line which is perpendicular to $y = 5x + 3$ and which passes through the point (10, 4).

(b) _____ [3]

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