



M9

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M9 – SECTION A**

B279A



Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:

- Geometrical instruments
- Tracing paper (optional)

**Thursday 20 January 2011
Morning**

Duration: 30 minutes



Candidate forename		Candidate surname	
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Centre number							Candidate number				
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MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. 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.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

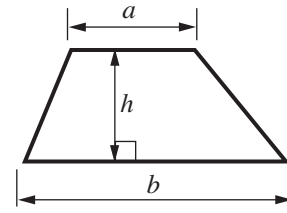
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

WARNING

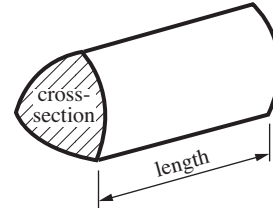
No calculator can be used for Section A of this paper

Formulae Sheet

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



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

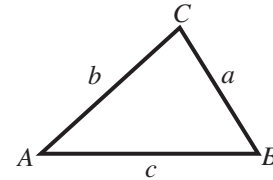


In any triangle ABC

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

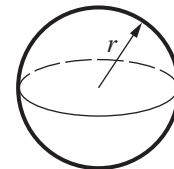
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



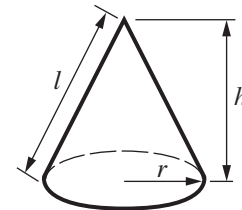
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

PLEASE DO NOT WRITE ON THIS PAGE

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]

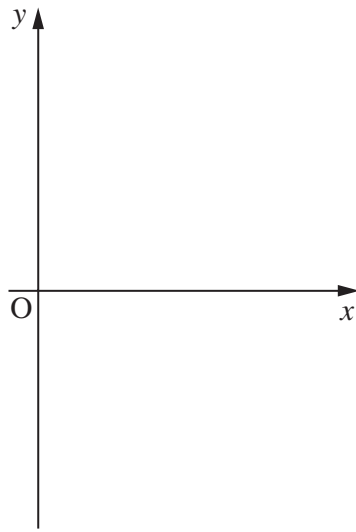
(c) Factorise and solve.

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

(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 .



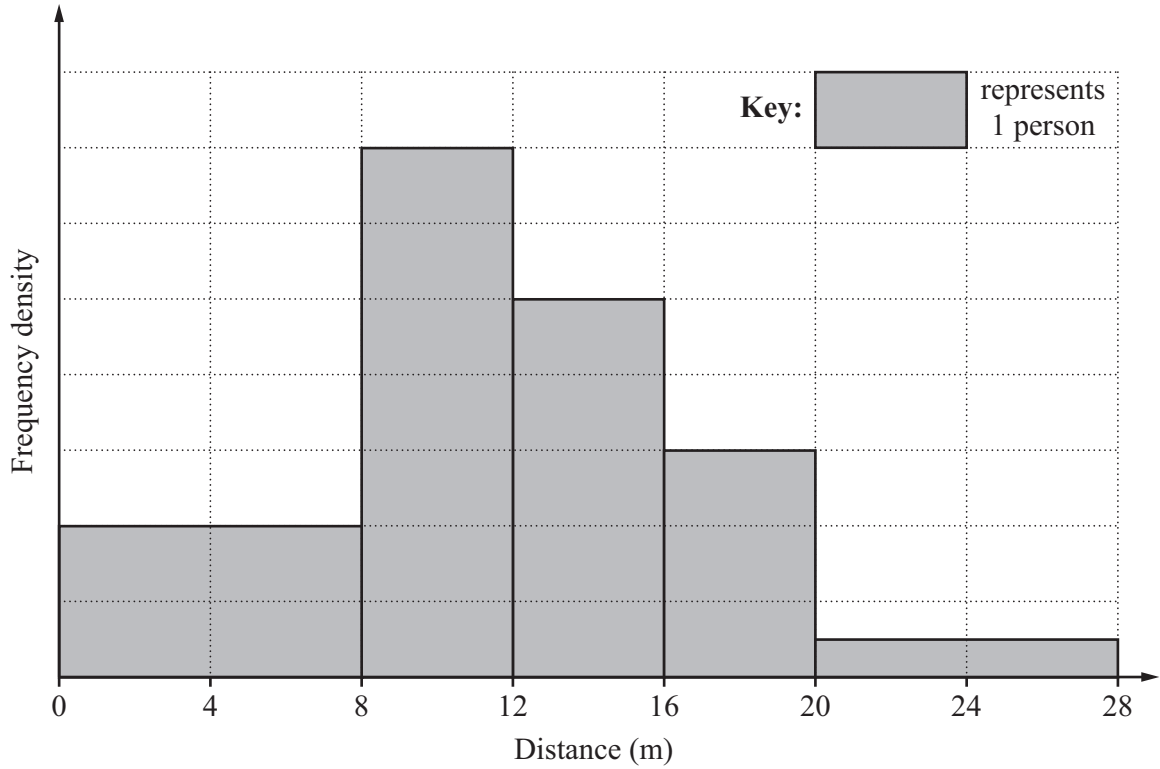
[1]

(b) Find the equation connecting y and x .

(b) [3]

5 There was a welly-throwing competition at a charity event.

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



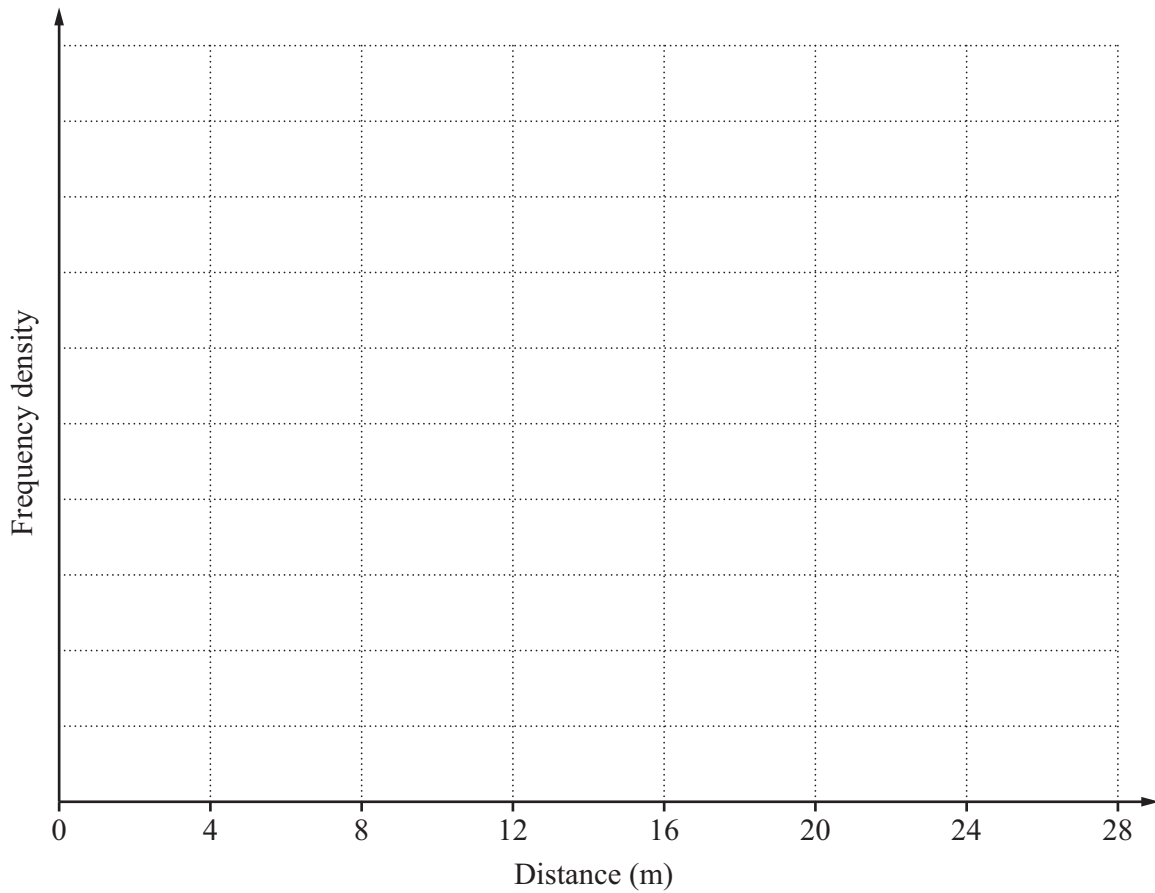
How many girls threw the welly more than 16 metres?

(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

Construct a histogram to represent this information on the grid below.
Use the same scale as the histogram in part (a).



[2]

TURN OVER FOR QUESTION 6

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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