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RECOGNISING ACHIEVEMENT

M9

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT) B279A
MODULE M9 – SECTION A

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	

Centre number						Candidate number				

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

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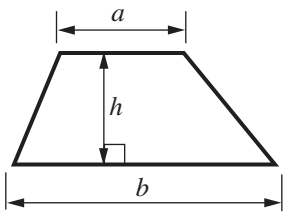
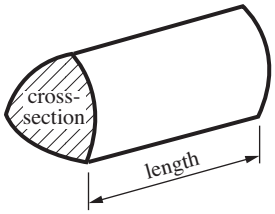
Formulae Sheet

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



Volume of prism = (area of cross-section) × length

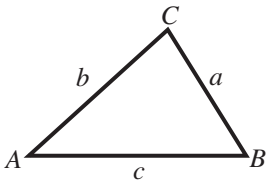


In any triangle ABC

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

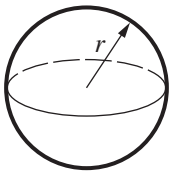
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



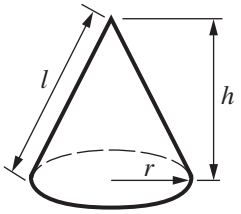
Volume of sphere = $\frac{4}{3}\pi r^3$

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]**

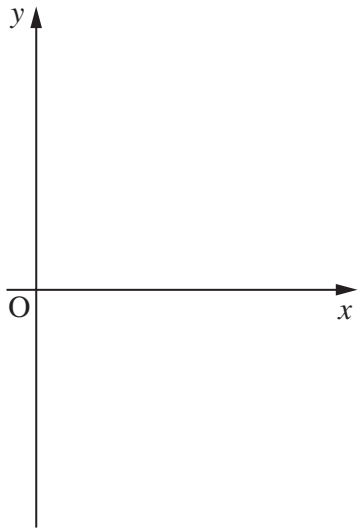
(c) Factorise and solve.

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

(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.



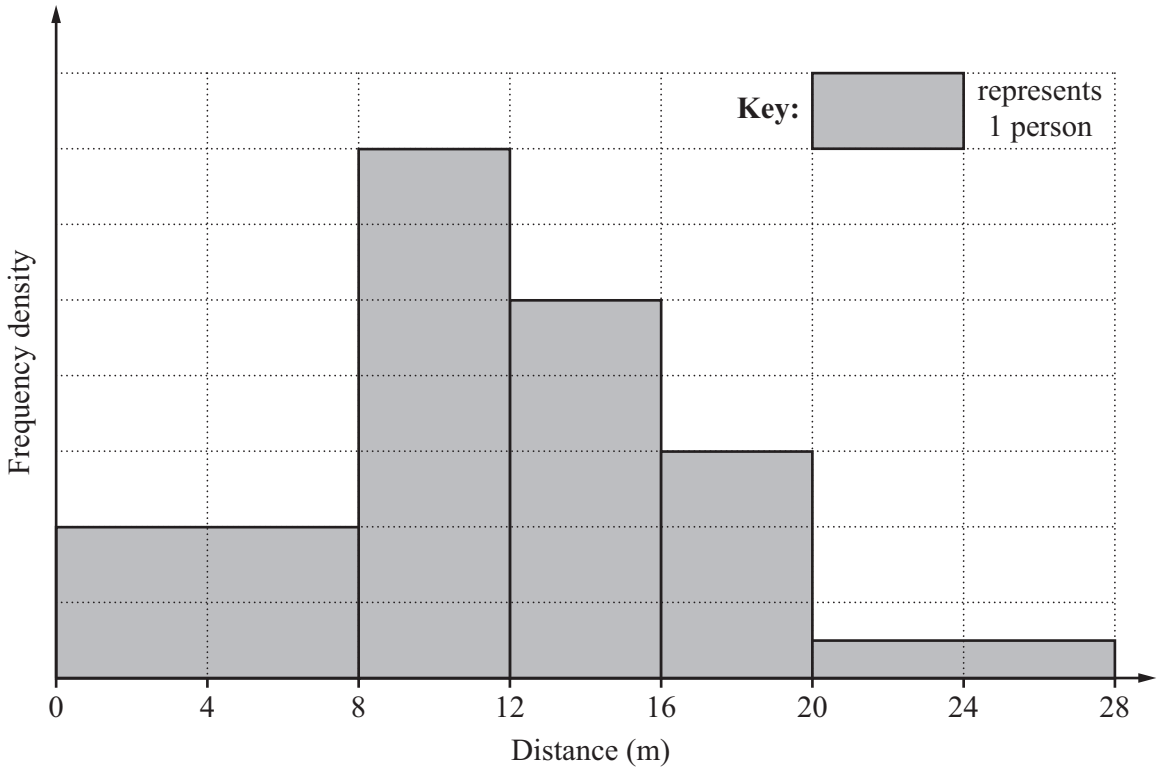
[1]

(b) Find the equation connecting y and x.

(b) ..... **[3]**

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

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



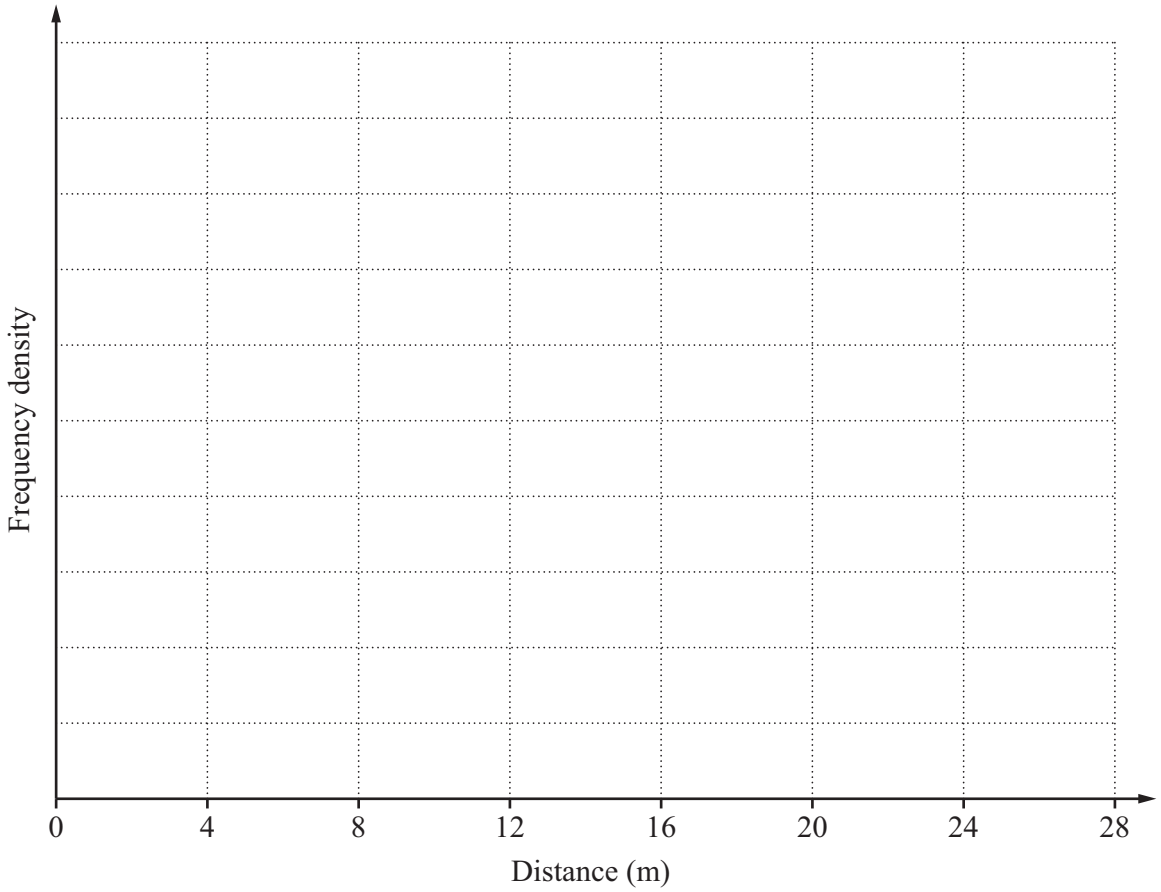
How many girls threw the welly more than 16 metres?

(a) ..... **[1]**

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

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

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