OCR
RECOGNISING ACHIEVEMENT

M9

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C (GRADUATED ASSESSMENT) B279B

MODULE M9 – SECTION B

CUP/T61590

Candidates answer on the question paper

OCR Supplied Materials:
None

Other Materials Required:
- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

Tuesday 20 January 2009
Morning

Duration: 30 minutes

B279B

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- 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.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

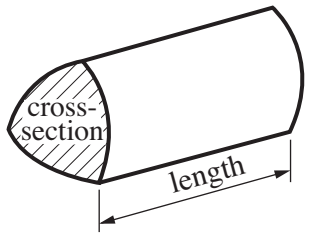
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Section B starts with question 7.
- 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**.
- This document consists of **8** pages. Any blank pages are indicated.

FOR EXAMINER'S USE	
SECTION B	

Formulae Sheet

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

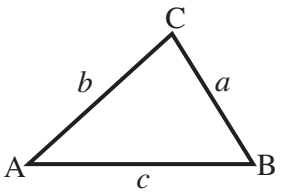


In any triangle ABC

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

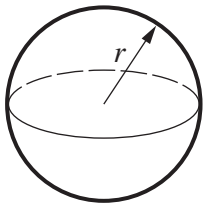
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



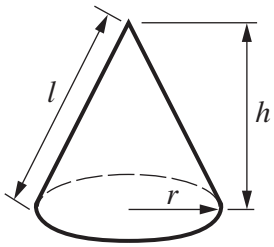
Volume of sphere = $\frac{4}{3}\pi r^3$

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

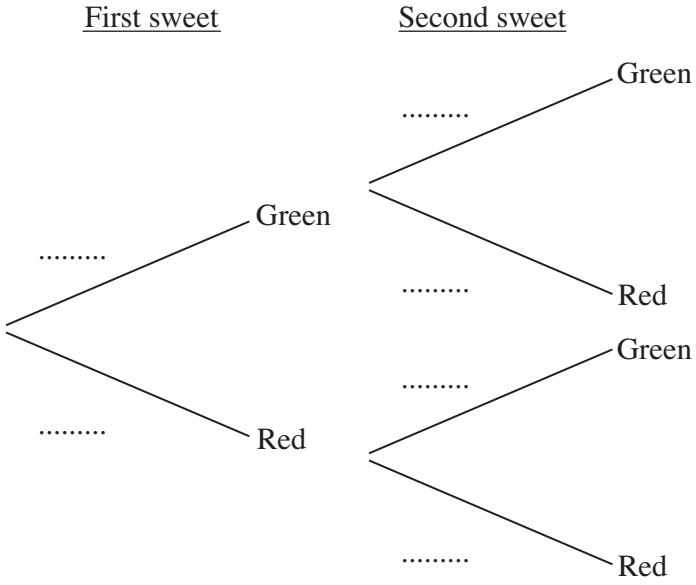
The solutions of $ax^2 + bx + c = 0$,
where $a \neq 0$, are given by

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

PLEASE DO NOT WRITE ON THIS PAGE

7 A bag contains 5 green sweets and 7 red sweets.
Clair takes a sweet at random and eats it.
She then takes a second sweet at random and eats it.

Use this tree diagram to work out the probability that she eats two green sweets.



..... **[3]**

8 **(a)** Make x the subject of this formula.

$$V = 6x^3$$

(a) ..... **[2]**

(b) Factorise.

$$x^2 - 25$$

(b) ..... **[1]**

9 The force of attraction, F Newtons, between two magnets is **inversely proportional** to the square of their distance apart, d cm.
When the magnets are 10 cm apart, the force of attraction is 4 Newtons.

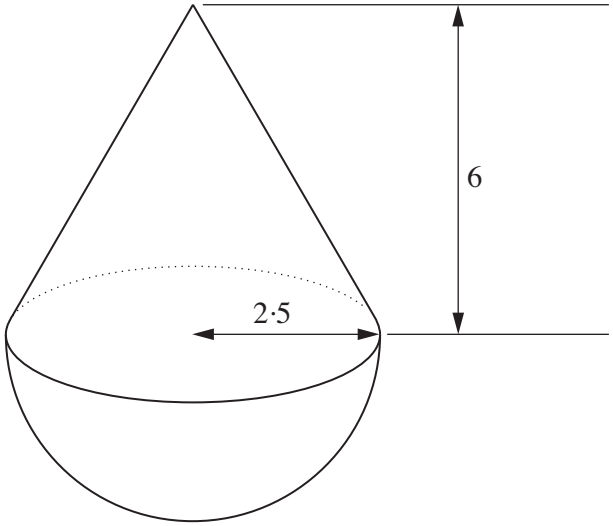
(a) Find an equation connecting F and d.

(a) ..... **[2]**

(b) How far apart are the magnets when the force of attraction is 6·25 Newtons?

(b) .....cm **[2]**

10 A spinning top consists of a cone and a hemisphere.



The cone has height 6 cm and base radius 2·5 cm.
The hemisphere has radius 2·5 cm.

(a) Calculate the volume of the hemisphere.

(a) ..... cm^3 **[2]**

(b) Calculate the total volume of the spinning top.

(b) ..... cm^3 **[2]**

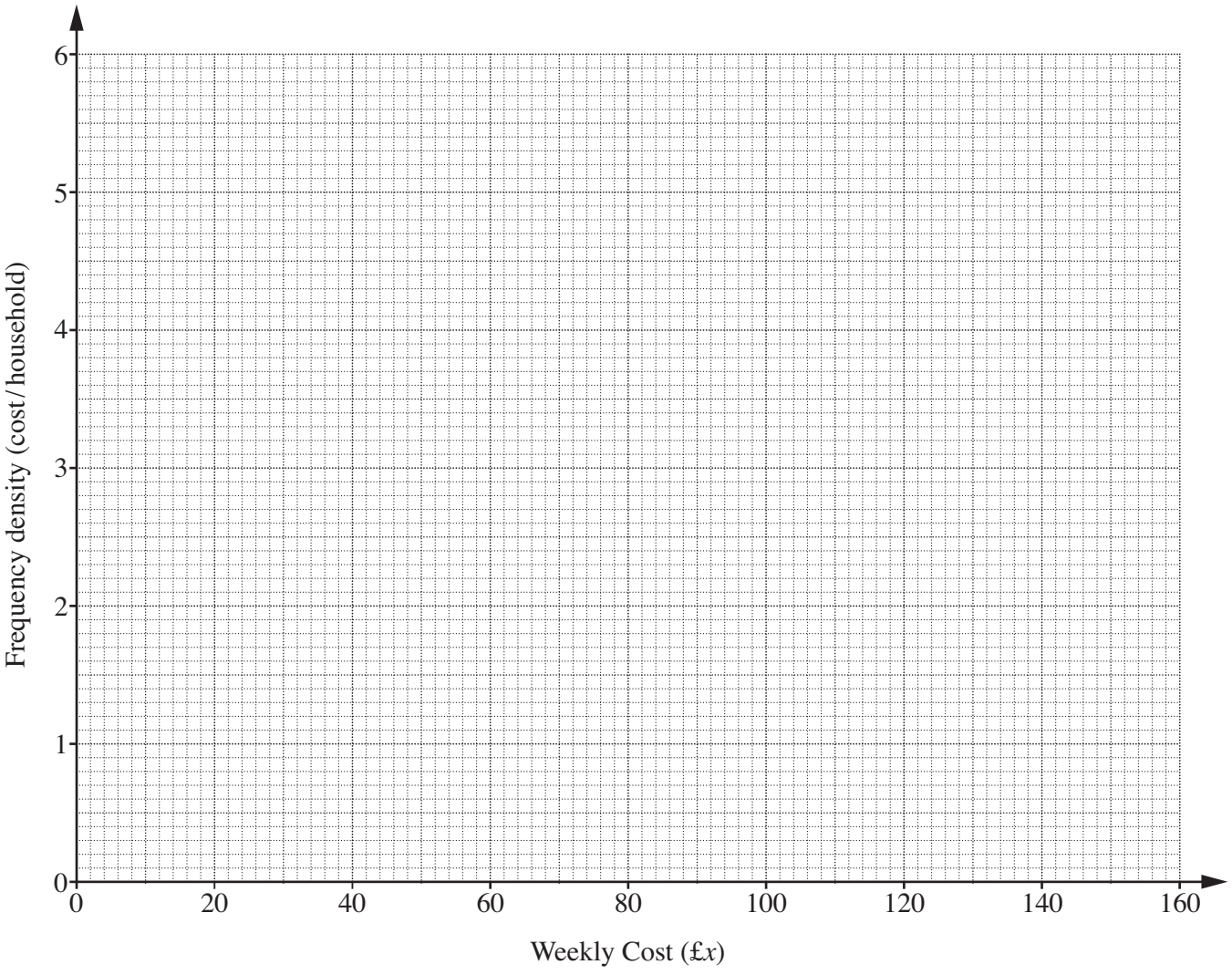
11 This table shows the distribution of the weekly costs, £x, of groceries for a sample of 200 households in the UK.

Weekly Cost (£x)	Frequency
$20 < x \leqslant 40$	18
$40 < x \leqslant 50$	50
$50 < x \leqslant 80$	96
$80 < x \leqslant 140$	36

(a) Calculate an estimate of the mean weekly cost.

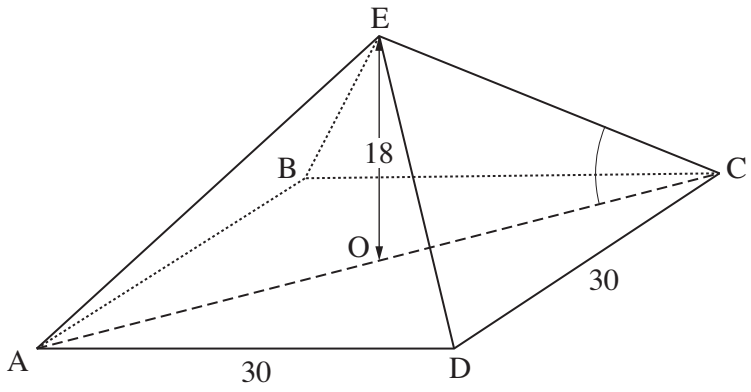
(a) £..... **[3]**

(b) Draw a histogram to illustrate the data in the table.



[3]

12 ABCDE is a square-based pyramid of height 18 cm.
The base ABCD has sides of length 30 cm.
E is vertically above O, the midpoint of the base.



Calculate angle ECO.

.....° **[5]**

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