OCR
RECOGNISING ACHIEVEMENT

M9

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

CUP/T61588

Candidates answer on the question paper

OCR Supplied Materials:
None

Other Materials Required:
- Geometrical instruments
- Tracing paper (optional)

Tuesday 20 January 2009
Morning

Duration: 30 minutes

B279A

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.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

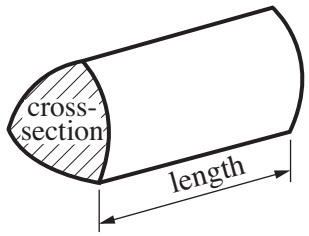
WARNING

No calculator can be used for Section A of this paper

FOR EXAMINER'S USE	
SECTION A	
SECTION B	
TOTAL	

Formulae Sheet

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

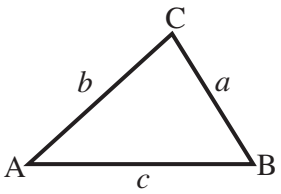


In any triangle ABC

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

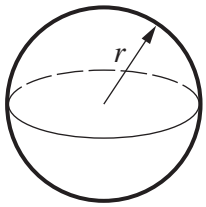
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



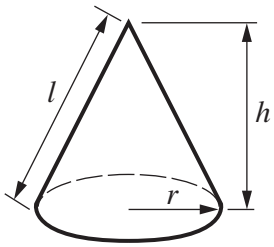
Volume of sphere = $\frac{4}{3}\pi r^3$

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

1 Philip wants to fit a cupboard and a dishwasher side by side in his kitchen.
The width of the cupboard is 50 cm, correct to the nearest centimetre.
The width of the dishwasher is 60 cm, correct to the nearest centimetre.

(a) Calculate the upper bound of the total width of the cupboard and the dishwasher.

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

(b) The space available measures 112 cm, correct to the nearest centimetre.
Philip fits the cupboard and dishwasher side by side in this space.

What is the lower bound of the space remaining?

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

2 Work out.

(a) 49^0

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

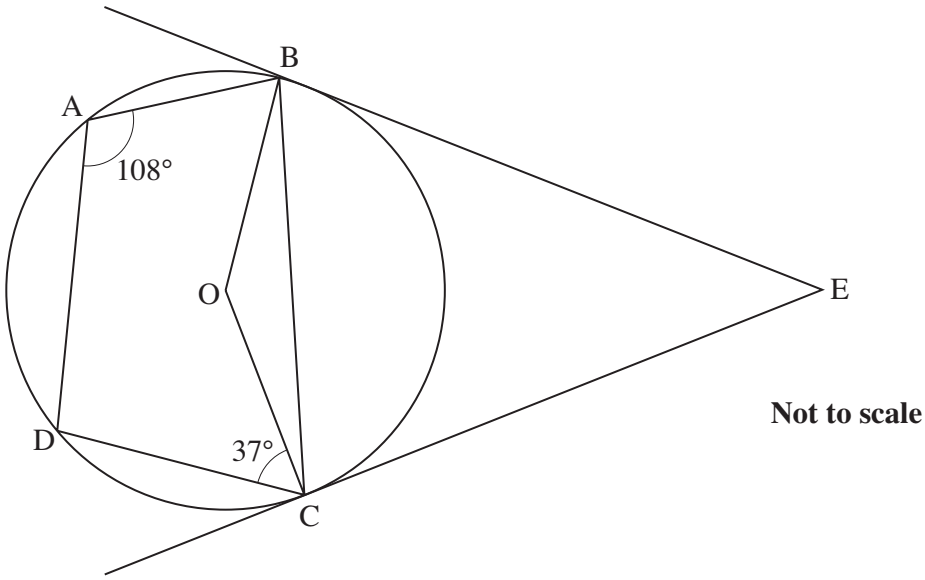
(b) 5^{-2}

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

(c) $9^{\frac{1}{2}}$

(c) ..... **[1]**

3



Not to scale

A, B, C and D are points on a circle, centre O.
The lines EB and EC are tangents to the circle.
Angle BAD = 108° and angle DCO = 37°.

(a) Explain why angle BCD is 72°.

.....

..... **[1]**

(b) Work out angle BEC.
Give a reason for each stage of your working.

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.....

.....

..... **[4]**

4 **(a)** Expand and simplify.

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

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

(b) Factorise fully.

$$6x^2 - 8xy$$

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

(c) Solve by factorisation.

$$5x^2 + x - 18 = 0$$

(c) ..... **[3]**

5 A, B, C and D are four points with these coordinates.

A (2, 7) B (6, 19) C (10, 12) D ($^{-}$2, 16)

(a) Calculate the gradient of the line AB.

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

(b) Use gradients to show that CD is perpendicular to AB.

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.....

.....

..... **[2]**

6 José surveys public opinion on university fees.
He stands in a shopping centre on a Wednesday morning and surveys every 20th person who passes.

Give two reasons why this method will not give a random sample.

1 .....

.....

2 .....

..... **[2]**

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