

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

B279B

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

Monday 8 March 2010
Morning

Duration: 30 minutes



Candidate Forename		Candidate Surname	
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Centre Number							Candidate Number				
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INSTRUCTIONS TO CANDIDATES

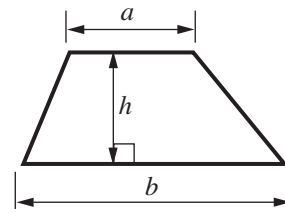
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show all your working. 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

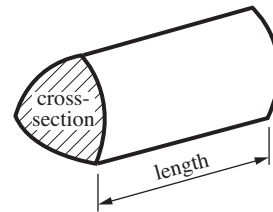
- The number of marks is given in brackets [] at the end of each question or part question.
- Section B starts with question 7.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

Formulae Sheet

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



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

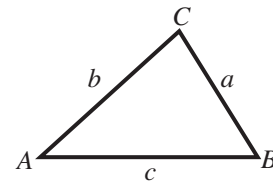


In any triangle ABC

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

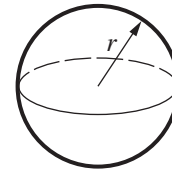
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



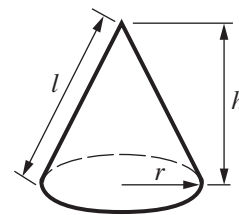
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

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7 (a) (i) Factorise.

$$x^2 - 25$$

(a)(i) [1]

(ii) Hence simplify.

$$\frac{x^2 - 25}{2x^2 + 11x + 5}$$

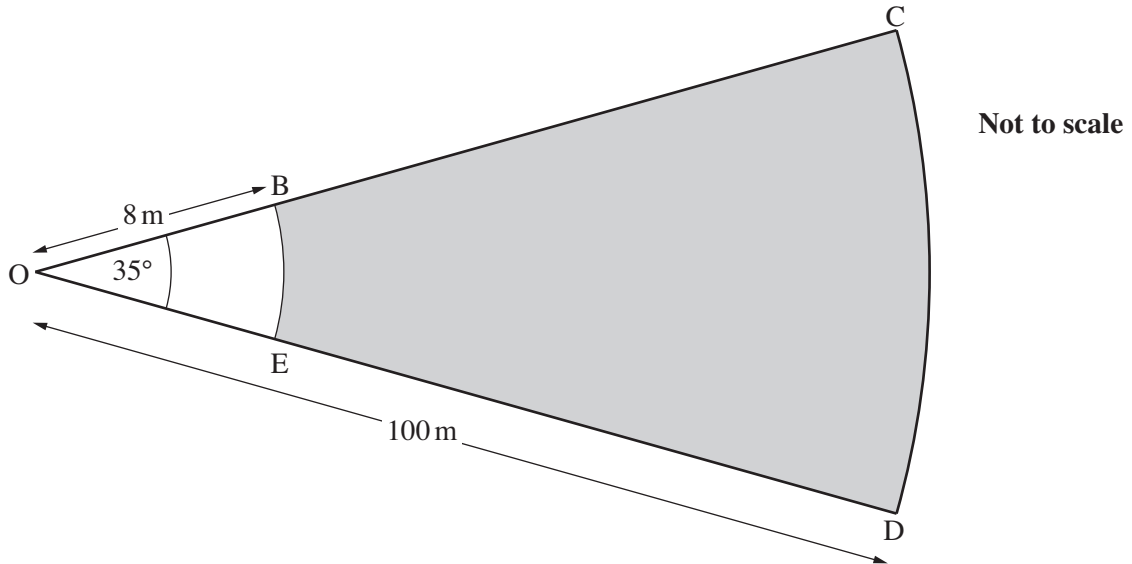
(ii) [3]

(b) Rearrange this formula to make r the subject.

$$A = 4\pi r^2$$

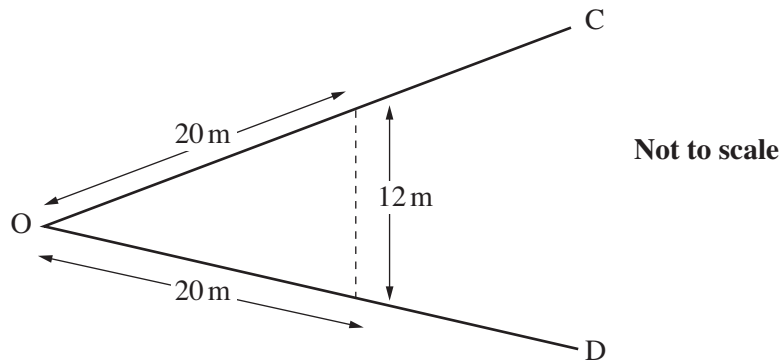
(b) [2]

- 8 The shaded part of the diagram shows the landing zone for a javelin throw.
 OBC and OED are straight lines.
 BE is an arc of a circle, centre O, and radius 8 m.
 CD is an arc of a circle, centre O, and radius 100 m.
 The angle COD is 35° .



- (a) A groundsman uses the following method to check that angle COD measures 35° .

Mark points on the sector lines OC and OD, 20 m from the centre O, and check that they are 12 m apart.



Use trigonometry to show that this method confirms that angle COD is 35° , correct to the nearest degree.

[4]

5

(b) Calculate the area of the landing zone BCDE.

(b) m² **[4]**

6

9 Phil is playing darts and aiming for a score of 60 with each throw.
The probability that he scores 60 with a single throw is $\frac{1}{8}$.

(a) Calculate the probability that Phil scores 60 on two consecutive throws.

(a) [2]

(b) Calculate the probability that in two consecutive throws, Phil scores 60 exactly once.

(b) [3]

- 10** The area of a rectangular football pitch is 6230 m^2 , correct to the nearest 10 m^2 .
The length of the football pitch is 108 m , correct to the nearest metre.

Calculate the greatest possible width of the football pitch.

..... m [3]

- 11** The braking distance, d metres, of a lorry is directly proportional to the square of its speed, s metres per second.
The braking distance is 81 metres when the speed is 30 metres per second.

Find the braking distance when the speed is 40 metres per second.

..... m [3]

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