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M9

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT) B279B
MODULE M9 (SECTION B)

OCE/27363

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:
- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

Tuesday 21 June 2011
Afternoon

Duration: 30 minutes

B279B

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

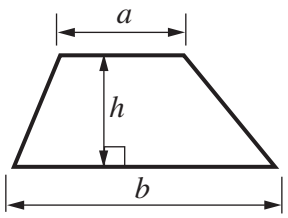
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show your working. 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

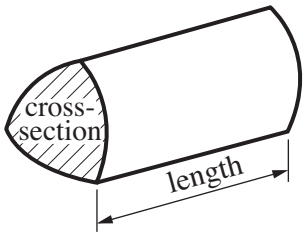
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.
- The 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) × length

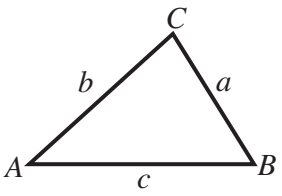


In any triangle ABC

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

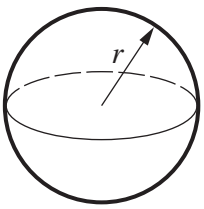
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



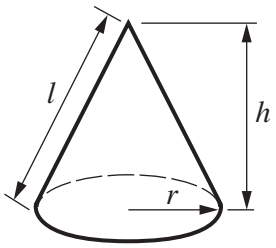
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

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8 **(a)** Factorise.

$$x^2 - 16$$

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

(b) Hence simplify.

$$\frac{x^2 - 16}{x^2 - 5x + 4}$$

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

9 The table shows the age distribution of employees working for a banking group.

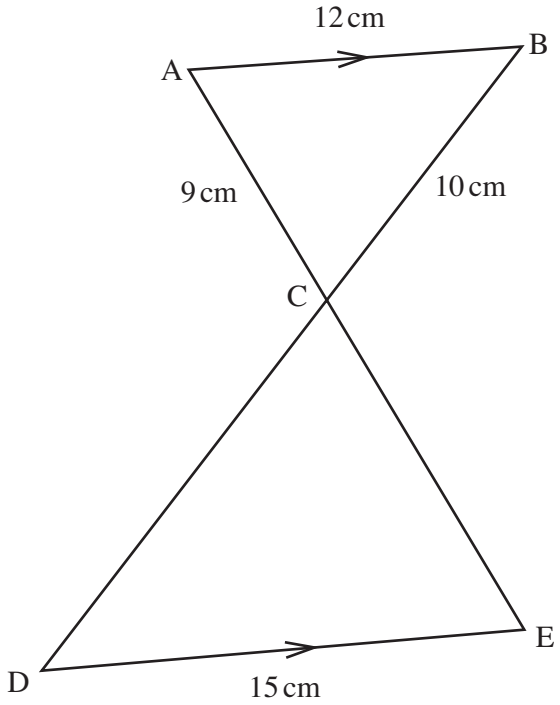
Age	Number of people
21 to 30	9500
31 to 40	7300
over 40	3600

The management of the company wish to sample 100 workers to take part in a survey.

Calculate how many employees aged over 40 are needed for a representative stratified random sample.

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

10



Not to scale

Triangle ABC is similar to triangle EDC.
AB is parallel to DE.
AB = 12 cm, AC = 9 cm, BC = 10 cm and DE = 15 cm.

(a) Calculate the length CD.

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

(b) The area of triangle EDC is 68·81 cm^2.

Calculate the area of triangle ABC.

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

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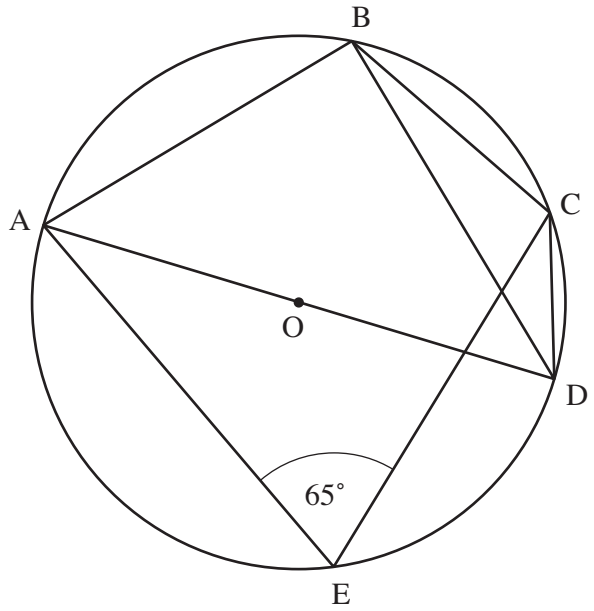


Not to scale

A, B, C, D and E are points on the circumference of a circle, centre O.
AD is a diameter of the circle.
Angle AEC = 65°.

(a) Find angle ADC, giving a reason for your answer.

Angle ADC = ...° because .....

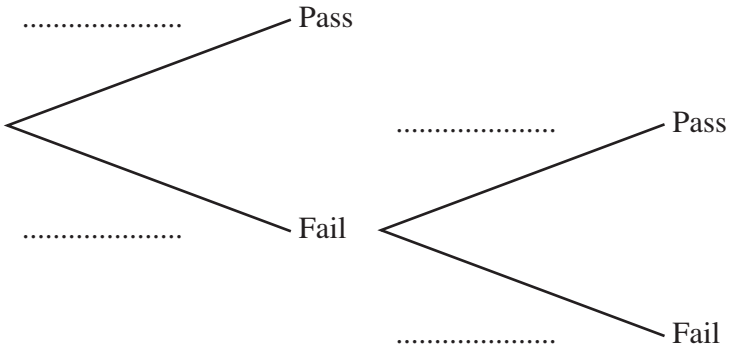
..... **[2]**

(b) Find angle CBD.

(b) .....° **[3]**

12 John is learning to drive.
He has a probability of 0·6 of passing the driving test on his first attempt.
If he fails, he has a probability of 0·7 of passing on his second attempt.

(a) Complete the probability tree diagram.



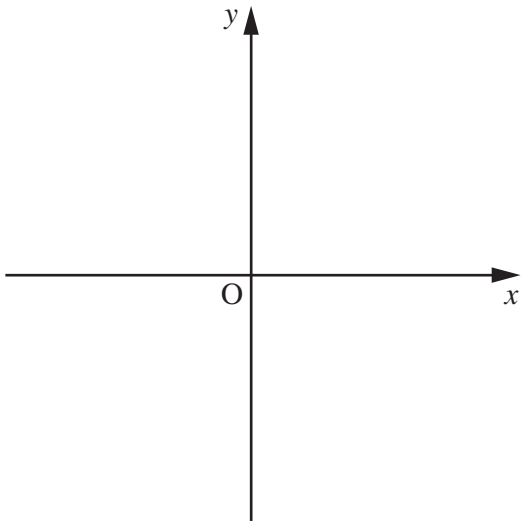
[1]

(b) Calculate the probability that John passes the driving test on his first or second attempt.

(b) ..... [3]

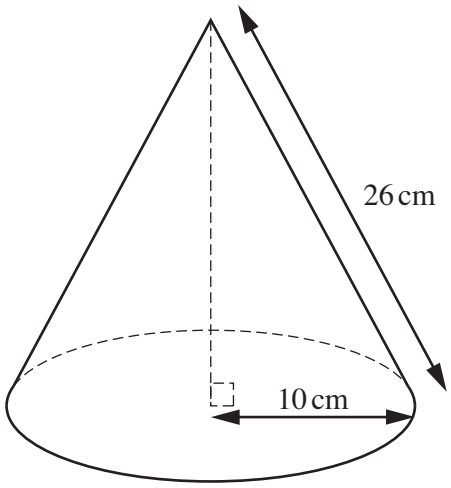
13 y is **inversely** proportional to x.

Sketch a possible graph for this relationship.



[2]

14



This cone has base radius 10 cm and slant height 26 cm.

Calculate the volume of the cone.

.....cm^3 **[4]**

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