

<b>Candidate forename</b>		<b>Candidate surname</b>	
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<b>Centre number</b>						<b>Candidate number</b>				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**B279B**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**MODULE M9 (SECTION B)**

**TUESDAY 21 JUNE 2011: Afternoon**

**DURATION: 30 minutes**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the question paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Geometrical instruments**

**Tracing paper (optional)**

**Scientific or graphical calculator**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

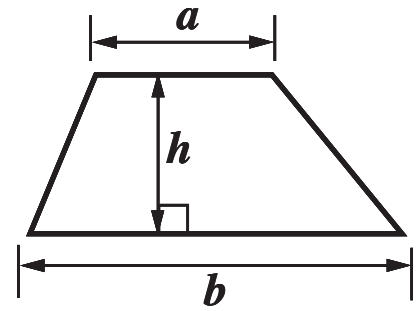
- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**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

## **INFORMATION FOR CANDIDATES**

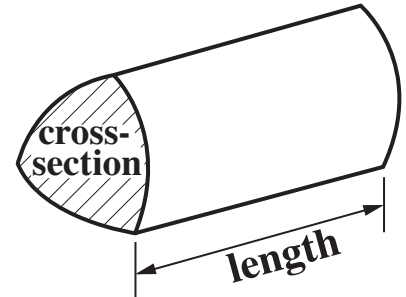
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **Section B starts with question 8.**
- **You are expected to use a calculator in Section B of this paper.**
- **Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.**
- **The total number of marks for this Section is 25.**

# FORMULAE SHEET

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



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

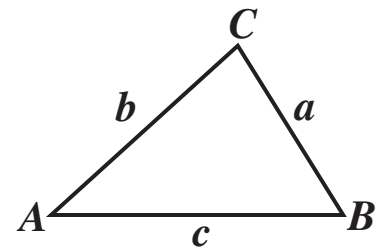


**In any triangle ABC**

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

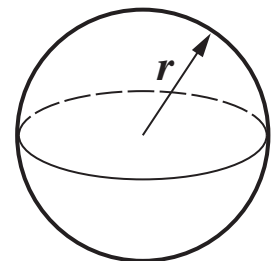
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



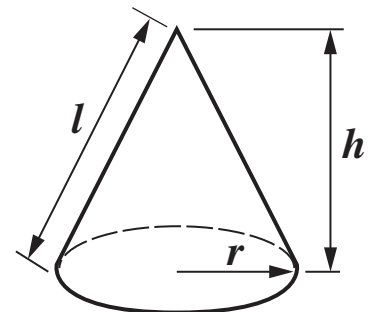
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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

**8 (a) Factorise.**

$$x^2 - 16$$

**(a)** \_\_\_\_\_ **[1]**

**(b) Hence simplify.**

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

**(b)** \_\_\_\_\_ **[3]**

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

<b>Age</b>	<b>Number of people</b>
<b>21 to 30</b>	<b>9500</b>
<b>31 to 40</b>	<b>7300</b>
<b>over 40</b>	<b>3600</b>

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

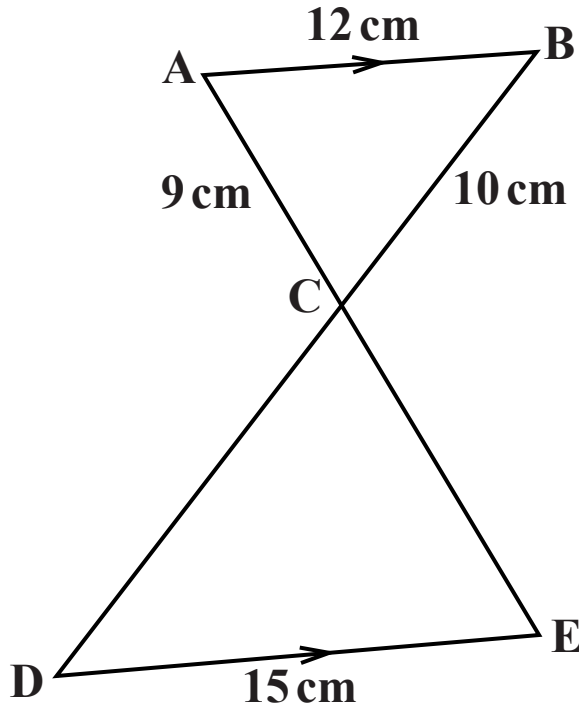
**Calculate how many employees aged over 40 are needed for a representative stratified random sample.**

\_\_\_\_\_ [2]

**10** In the diagram below, 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.**



**NOT TO SCALE**

**(a)** Calculate the length **CD**.

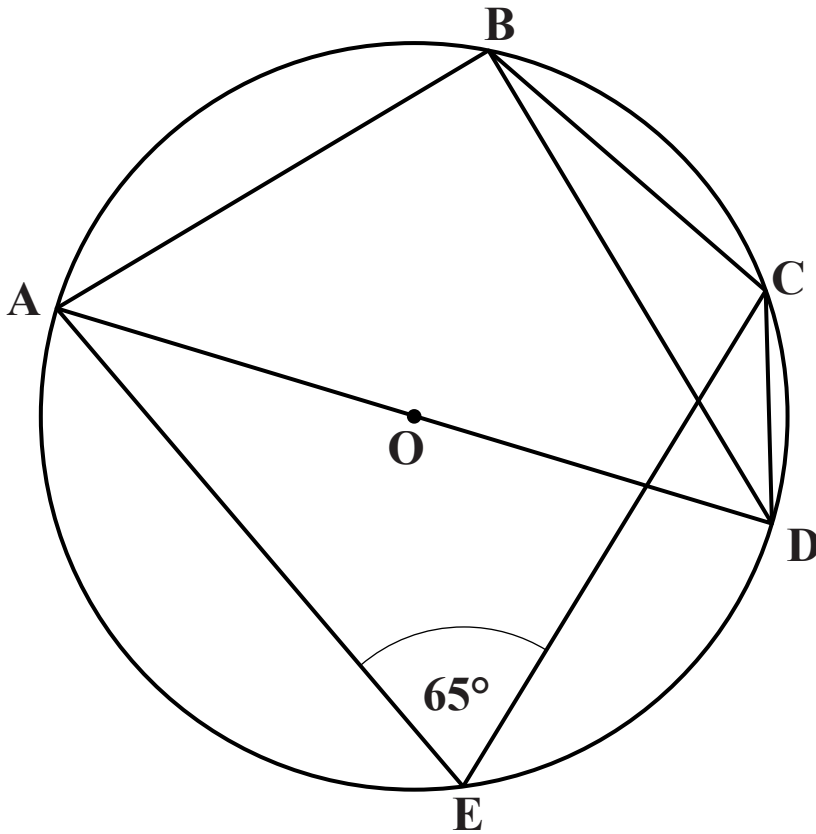
**(a)** \_\_\_\_\_ cm [2]

**(b) The area of triangle EDC is  $68.81 \text{ cm}^2$ .**

**Calculate the area of triangle ABC.**

**(b) \_\_\_\_\_  $\text{cm}^2$  [2]**

- 11 In the diagram below, 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 =  $65^\circ$ .



NOT TO SCALE

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

Angle ADC = \_\_\_\_\_ $^\circ$  because \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [2]



**(b) Find angle CBD.**

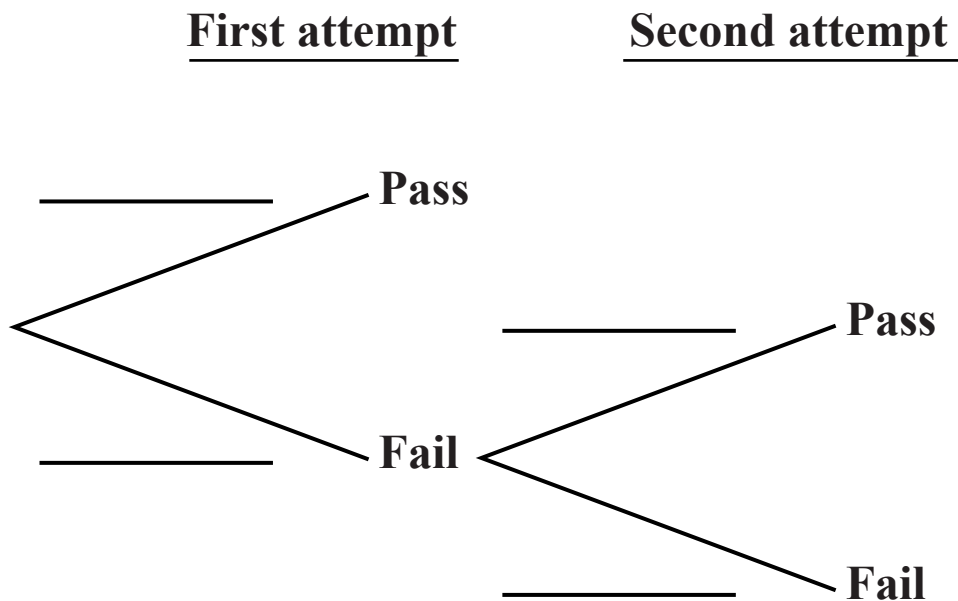
**(b) \_\_\_\_\_° [3]**

**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.**



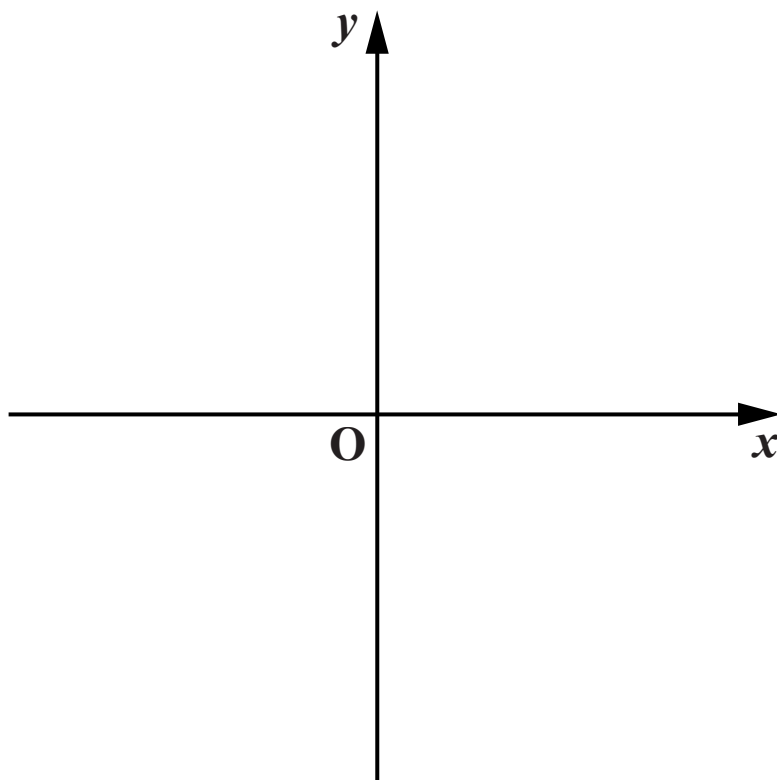
[1]

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

**(b) \_\_\_\_\_ [3]**

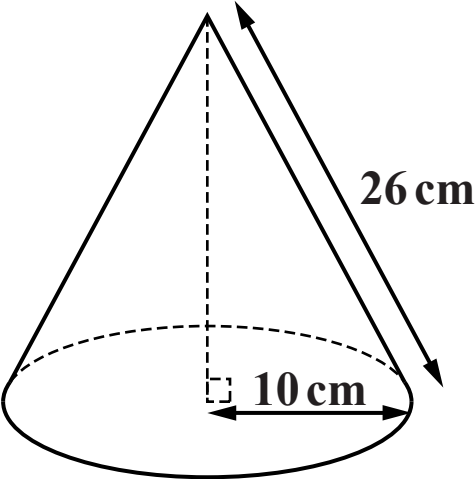
**13**  $y$  is **INVERSELY** proportional to  $x$ .

**Sketch a possible graph for this relationship.**



**[2]**

14 The cone below has base radius 10 cm and slant height 26 cm.



Calculate the volume of the cone.

\_\_\_\_\_  $\text{cm}^3$  [4]