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Centre number						Candidate number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GCSE**

**B279B**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**MODULE M9 – SECTION B**

**MONDAY 16 JANUARY 2012: Morning**

**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**

**This paper has been pre modified for carrier language**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

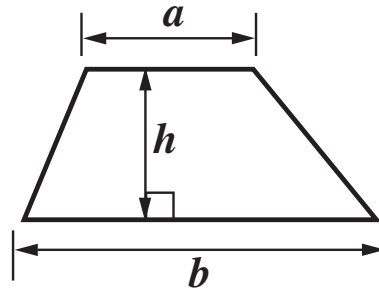
- Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer ALL the questions.
- Read each question carefully. Make sure you know what you have to do before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

## **INFORMATION FOR CANDIDATES**

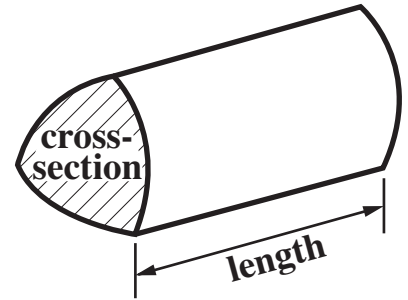
- The number of marks is given in brackets [ ] at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.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

# FORMULAE SHEET

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



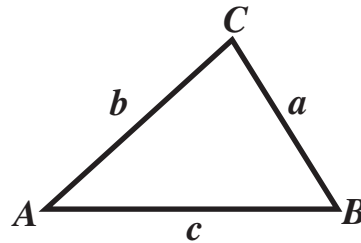
Volume of prism = (area of cross-section)  $\times$  length



In any triangle  $ABC$

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

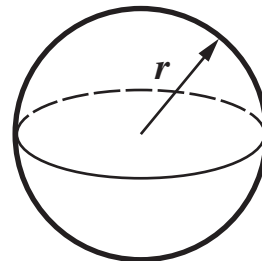
Cosine rule  $a^2 = b^2 + c^2 - 2bc \cos A$



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

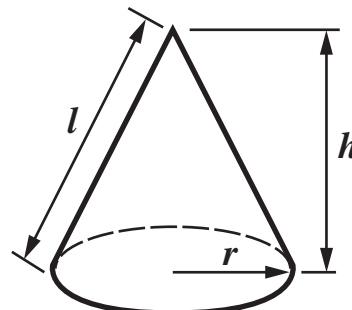
Volume of sphere =  $\frac{4}{3}\pi r^3$

Surface area of sphere =  $4\pi r^2$



Volume of cone =  $\frac{1}{3}\pi r^2 h$

Curved surface area of cone =  $\pi r l$

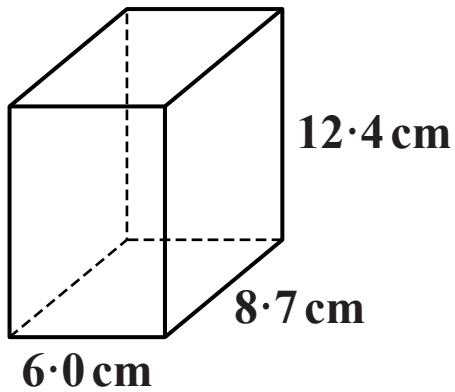


The Quadratic Equation

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 This box is a cuboid.**  
**The dimensions of the box are 6.0 cm, 8.7 cm and 12.4 cm,**  
**all measured correct to the nearest 0.1 cm.**



**Calculate the upper bound of the volume of the box.**

\_\_\_\_\_  $\text{cm}^3$  [2]

**9 Rearrange this formula to make  $x$  the subject.**

$$y = \frac{x^3 - 3}{2}$$

\_\_\_\_\_ [3]

**10 Mia and Paul are conducting a survey about students' opinions of school lunches. They each survey 50 students.**

**(a) Mia surveys the first 50 students in the lunch queue.**

**Explain why this is likely to be a biased sample.**

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**[1]**

**(b) Paul will survey a representative stratified sample of students from the different year groups. The table shows the number of students in each year group.**

<b>Year</b>	<b>Number of students</b>
<b>7</b>	<b>240</b>
<b>8</b>	<b>210</b>
<b>9</b>	<b>180</b>
<b>10</b>	<b>150</b>
<b>11</b>	<b>120</b>
<b>Total</b>	<b>900</b>

**How many Year 7 students should Paul survey?**

**(b) \_\_\_\_\_ [2]**

**11 Simplify.**

$$\frac{12x^3 - 21x}{3x}$$

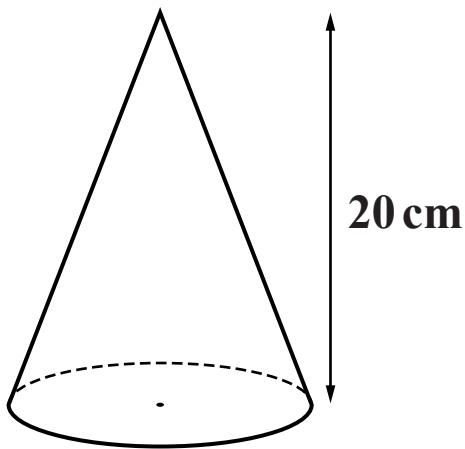
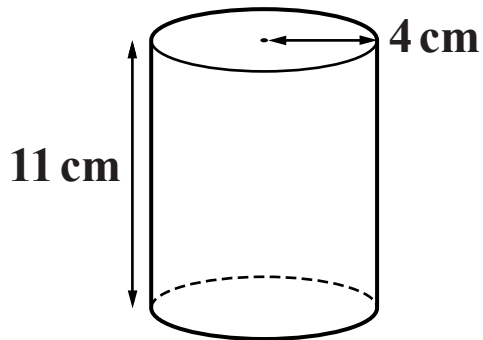
\_\_\_\_\_ [2]



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**TURN OVER FOR QUESTION 12**

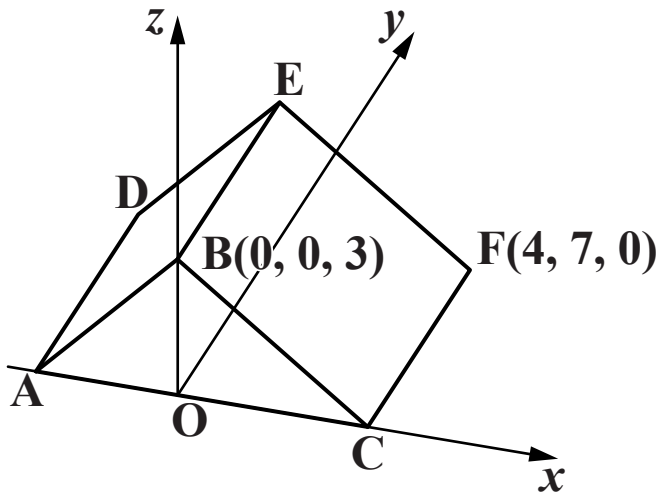
- 12** These two candles have the same volume.  
The cylindrical candle has radius 4 cm and height 11 cm.  
The conical candle has height 20 cm.



**Calculate the radius of the base of the conical candle.**

\_\_\_\_\_ cm [4]

- 13** The cross-section of this prism is an isosceles triangle, with  $AB = CB$ .  
The coordinates of B are  $(0, 0, 3)$  and of F are  $(4, 7, 0)$ .



- (a)** Write down the coordinates of A and E.

**(a)** A ( \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ )

E ( \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ ) [2]

- (b)** Calculate the length BF.

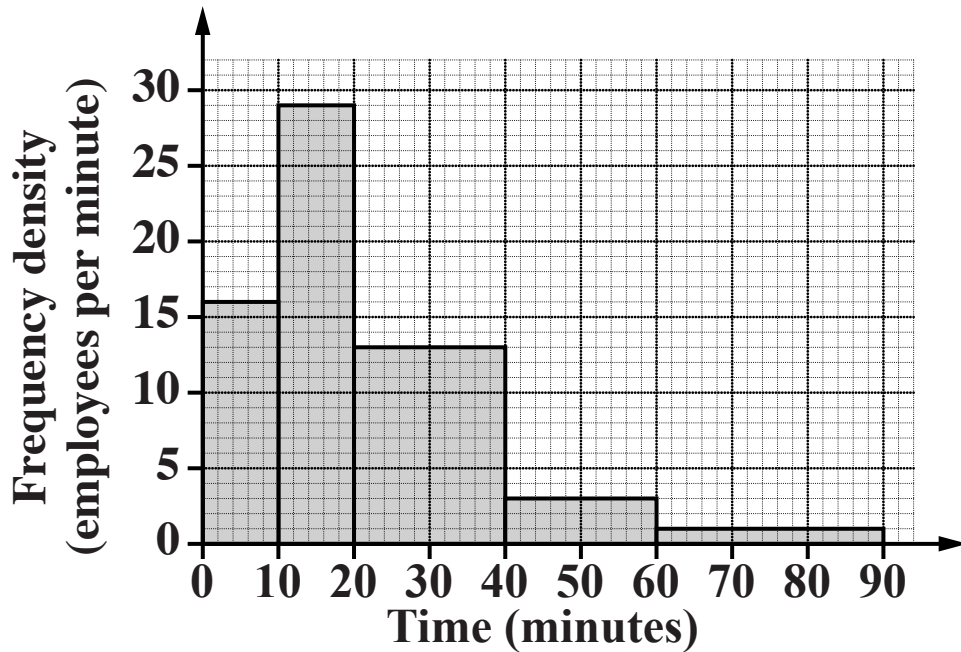
**(b)** \_\_\_\_\_ units [2]

**(c) Calculate the angle between OE and the  $y$ -axis.**

**(c) \_\_\_\_\_<sup>°</sup> [3]**

**TURN OVER FOR QUESTION 14**

- 14 Employees in a company are surveyed to find out about their journey times to work.  
This histogram shows the distribution of these times.



Find the percentage of these employees with a journey time of up to 20 minutes.

\_\_\_\_\_ % [4]

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