

<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**

**B278B**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**MODULE M8 – SECTION B**

**MONDAY 21 JUNE 2010: 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**

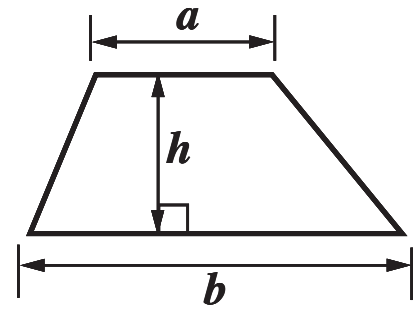
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer ALL the questions.
- 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**

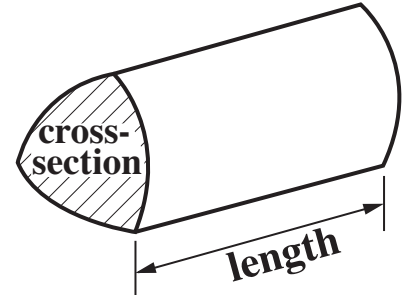
- The number of marks is given in brackets [ ] at the end of each question or part question.
- Section B starts with question 7.
- You are expected to use a calculator in Section B of this paper.
- Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.
- 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

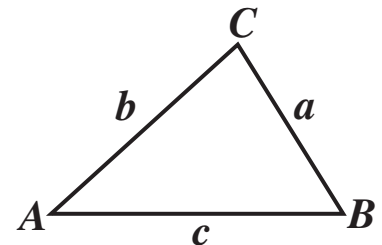


**In any triangle ABC**

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

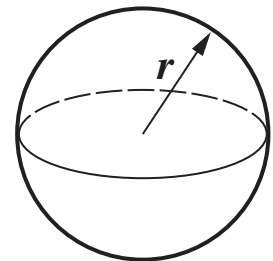
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



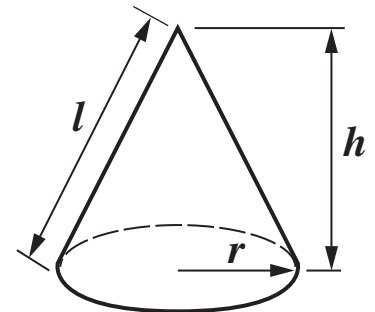
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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

- 7 (a) The Norfolk Wildlife Trust visitor centre at Cley collects 75 560 litres of rainwater from its roof in a year.**

**This is 65% of the total amount of water needed at the visitor centre.**

**Calculate the total amount of water needed for a year.  
[3 marks]**

**(a) \_\_\_\_\_ litres**

- (b) In 2007, there were 8500 pink-footed geese seen at a nature reserve.  
Each year this number has increased by 4% of its value the previous year.**

**How many pink-footed geese are expected to be seen at this reserve in 2010?  
[3 marks]**

**(b) \_\_\_\_\_**

**8 This table shows the number of customers attending a cinema over a four-week period.**

		Day						
		Sun	Mon	Tue	Wed	Thu	Fri	Sat
Week	1	201	132	181	292	307	513	602
	2	298	176	192	257	309	590	647
	3	257	211	184	292	401	612	718
	4	301	177	201	265	386	629	690

**Calculate the 7-day moving average for Friday of week 3 to Thursday of week 4.**

**[2 marks]**

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**9 Solve algebraically these simultaneous equations.**

$$3x - 2y = 4$$

$$2x - 3y = 0$$

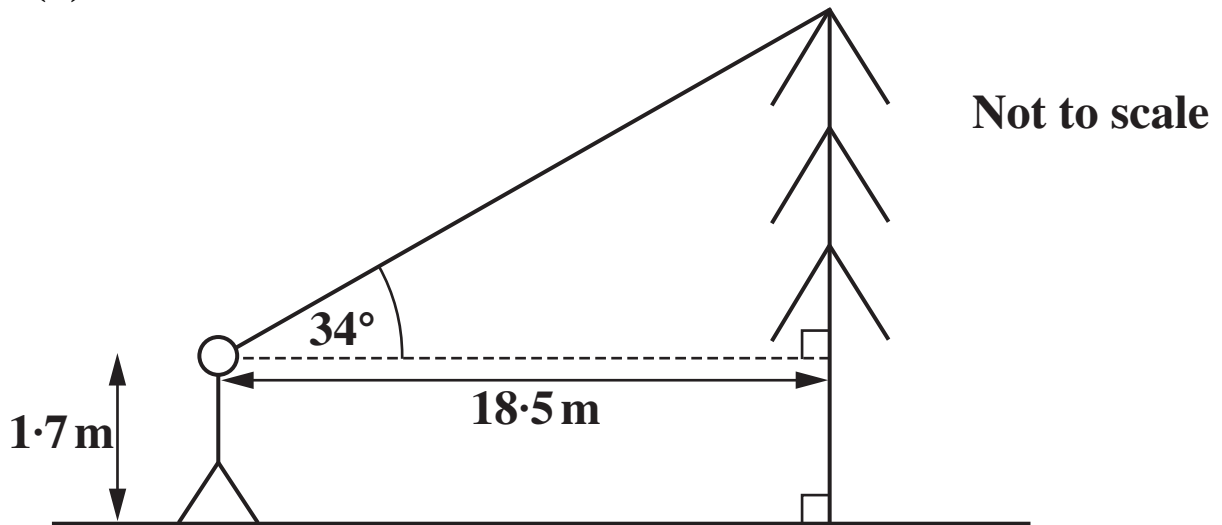
**[4 marks]**

$x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

**10 Class 10P uses angles to find the heights of trees in the grounds of Riverside School.**

**(a)**



**Hassan stands 18.5 m from a tree.**

**He measures the angle of elevation to the top of the tree as 34°, as shown.**

**His eyes are 1.7 m above the ground.**

**Calculate the height of this tree.**

**[4 marks]**

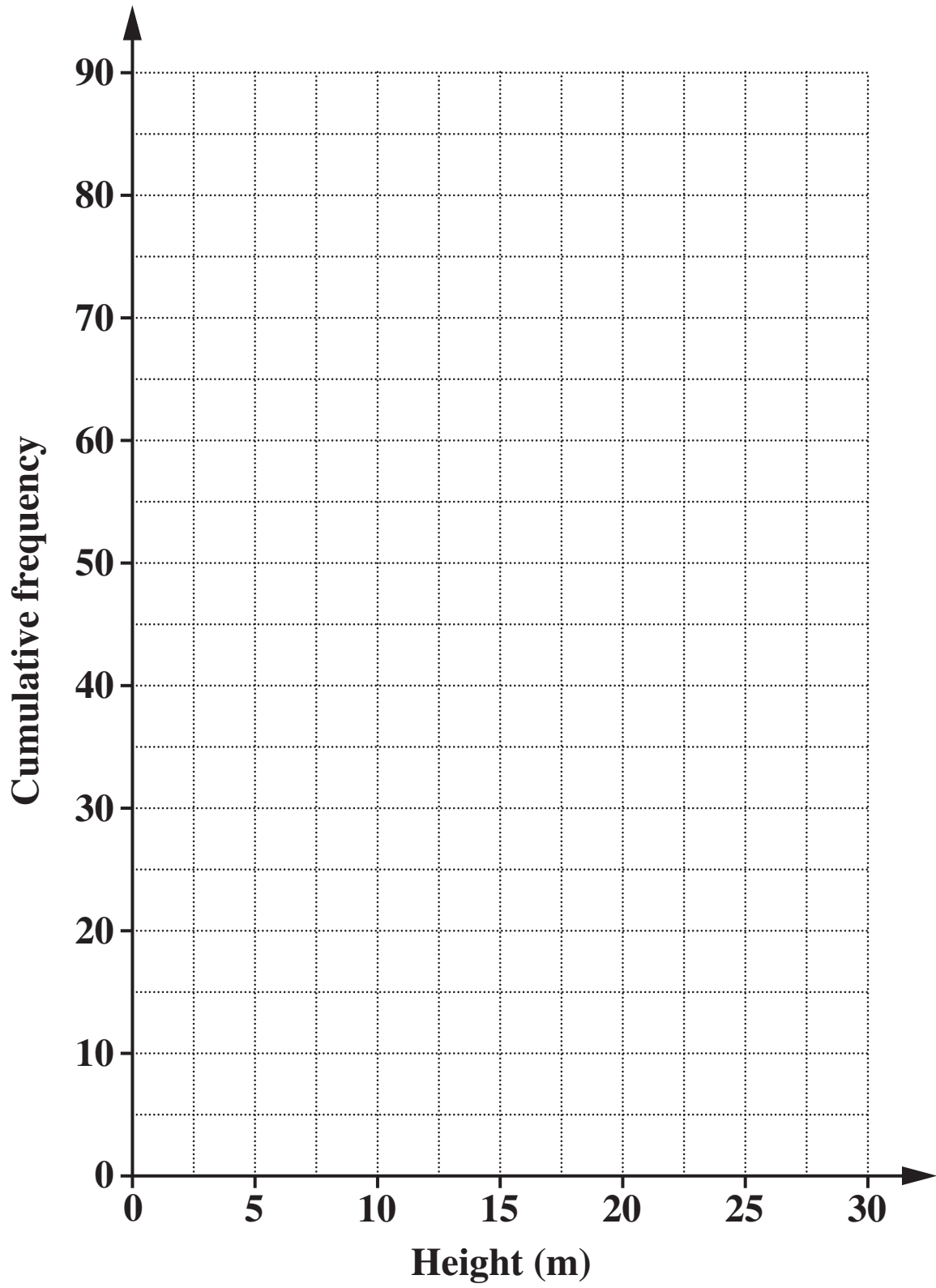
**(a) \_\_\_\_\_ m**

**(b) This cumulative frequency table summarises the heights of the 90 trees in Riverside School grounds.**

<b>Height (<math>h</math> m)</b>	<b><math>h \leq 5</math></b>	<b><math>h \leq 10</math></b>	<b><math>h \leq 15</math></b>	<b><math>h \leq 20</math></b>	<b><math>h \leq 25</math></b>	<b><math>h \leq 30</math></b>
<b>Cumulative frequency</b>	<b>12</b>	<b>35</b>	<b>62</b>	<b>78</b>	<b>86</b>	<b>90</b>

**(i) Draw the cumulative frequency graph for this distribution.**  
**[2 marks]**





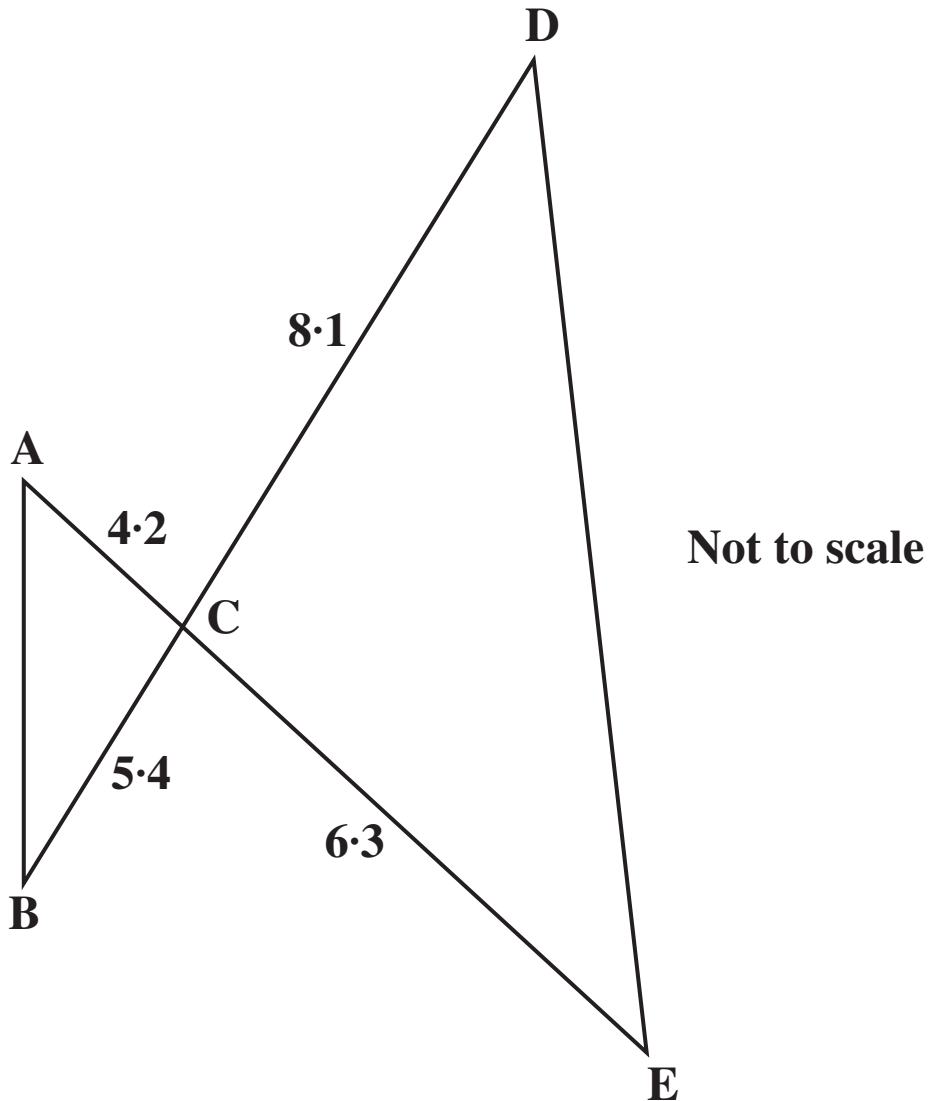
- (ii) Use your graph to estimate the median height of these trees.**  
**[1 mark]**

**(b)(ii)** \_\_\_\_\_ **m**

- (iii) Find an estimate of the percentage of the trees that are between 10 m and 18 m high.**  
**[3 marks]**

**(iii)** \_\_\_\_\_ **%**

- 11 ACE and BCD are straight lines.  
The lengths on this diagram are in centimetres.**



**Gemma says that triangles  $ABC$  and  $EDC$  are similar.**

**Show that Gemma is correct, giving your reasons.**

**[3 marks]**

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