

<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**

**B280B**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**MODULE M10 – SECTION B**

**TUESDAY 23 JUNE 2009: 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**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

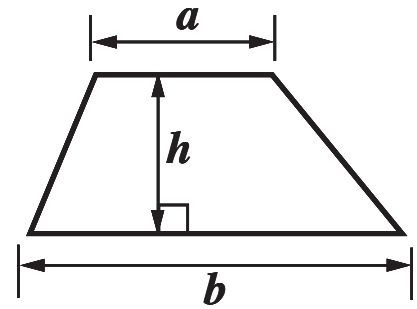
- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **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, however additional paper may be used if necessary.**

## **INFORMATION FOR CANDIDATES**

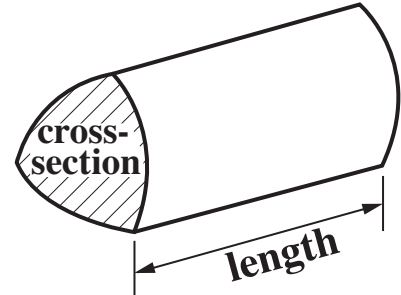
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **Section B starts with question 7.**
- **You are expected to use a calculator in Section B of this paper.**
- **Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question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

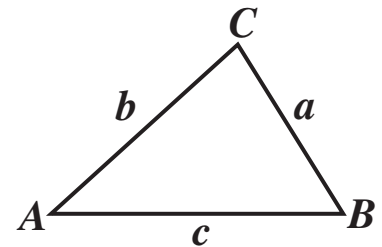


**In any triangle ABC**

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

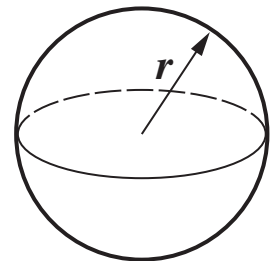
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



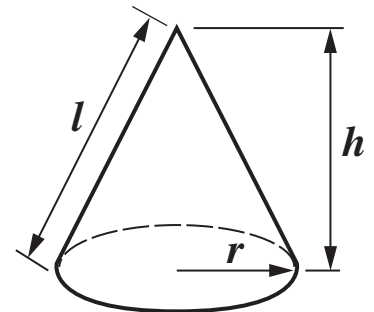
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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



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

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

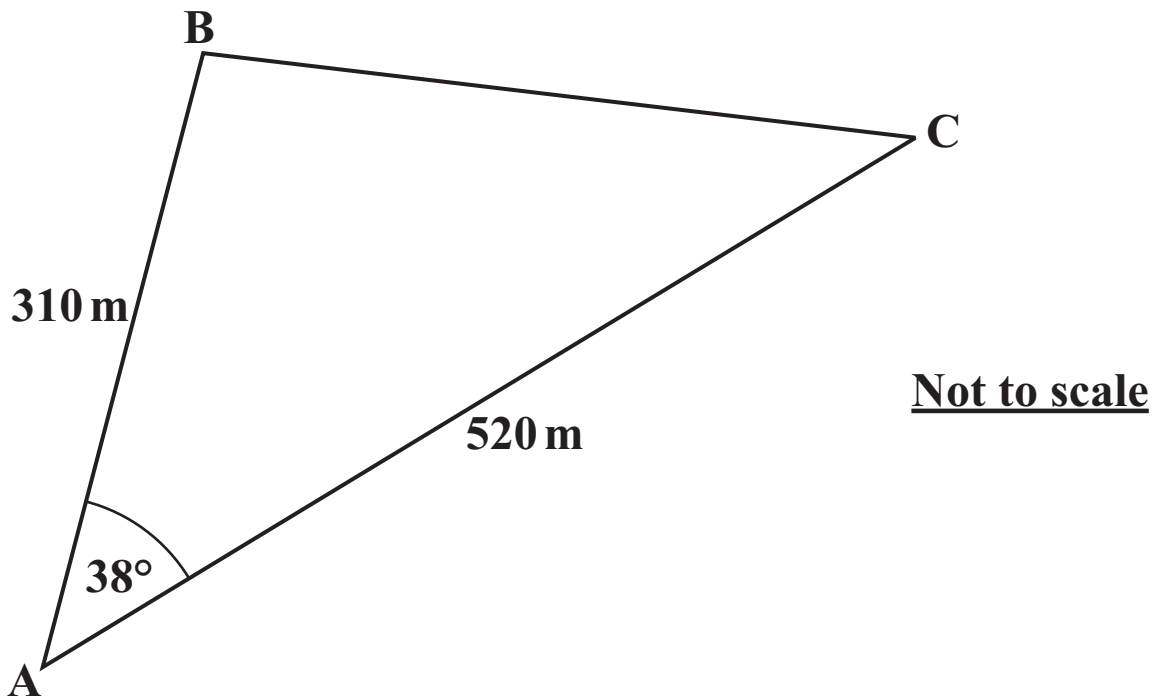


**The Quadratic Equation**

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 The diagram below shows three straight roads surrounding a field.  
The angle BAC is  $38^\circ$ , and the roads AB and AC have lengths 310 m and 520 m respectively.



- (a) Calculate the length of the road BC.  
Give your answer to an appropriate degree of accuracy.  
[4 marks]

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

**(b) Calculate the area of the field in hectares  
(1 hectare = 10 000 m<sup>2</sup>).  
[3 marks]**

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

- 8** A cup of hot tea is left to cool.  
The temperature,  $T$  °C, of the tea  $m$  minutes after it is made is given by the formula

$$T = 62 \times 0.97^m + 23.$$

- (a) What is the temperature of the tea when it is made?  
[1 mark]

(a) \_\_\_\_\_ °C

- (b) Find the temperature of the tea after 5 minutes.  
[2 marks]

(b) \_\_\_\_\_ °C

**(c) After how many minutes will the tea have cooled to 40 °C?  
[2 marks]**

**(c) \_\_\_\_\_ minutes**

- 9 Solve algebraically, giving your solutions correct to two decimal places.**

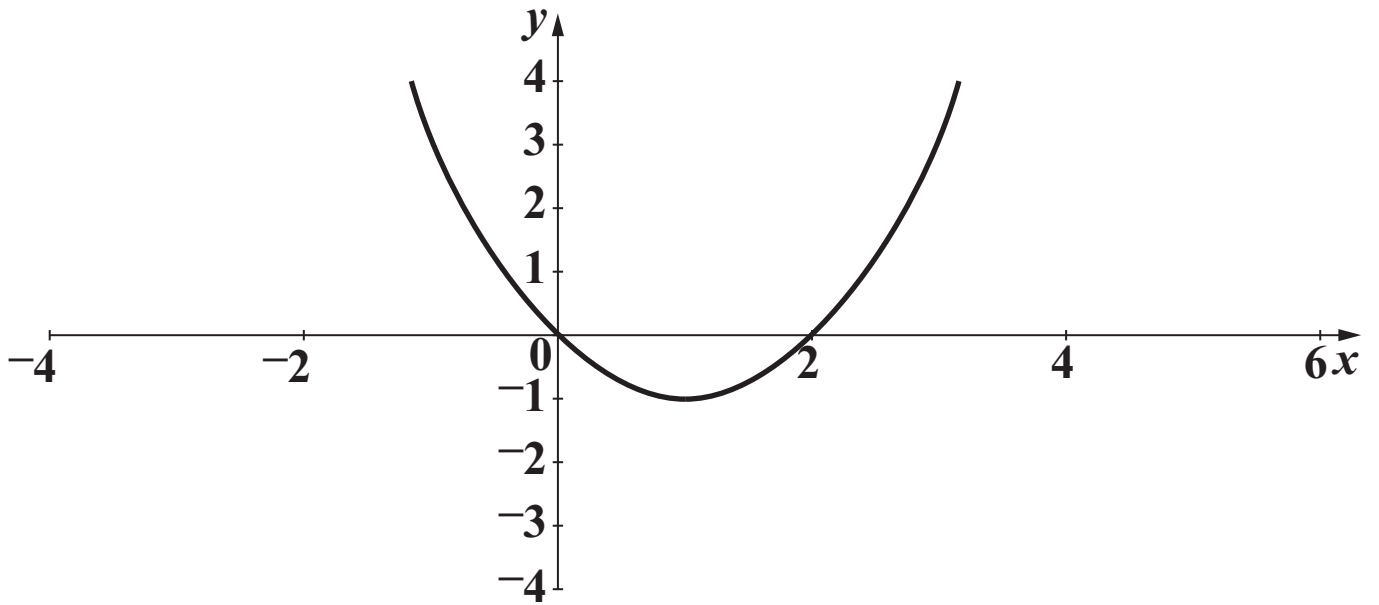
$$\frac{5}{x-3} + \frac{2}{x+1} = 3$$

**[7 marks]**



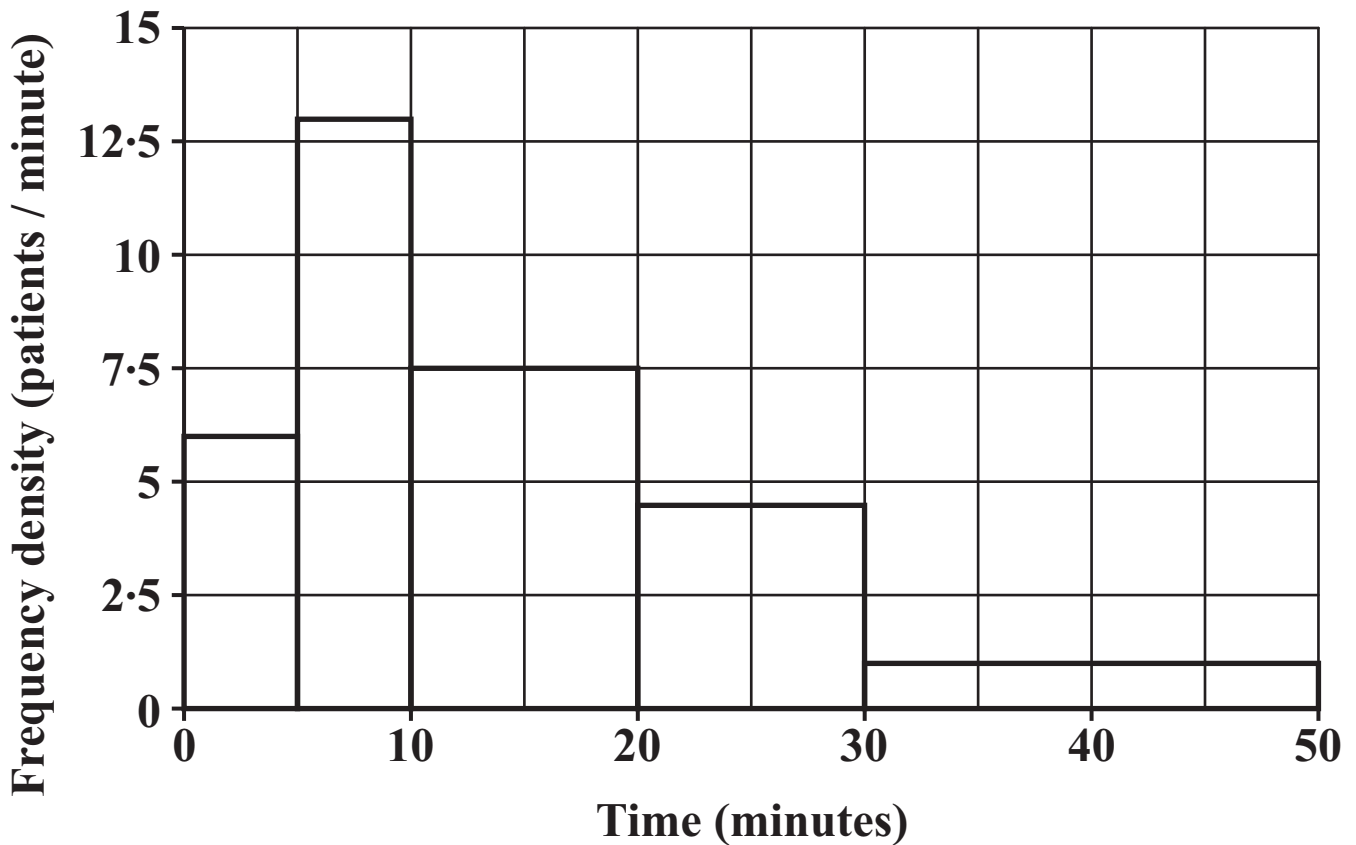
**10** The graph of  $y = f(x)$  is drawn below.

On the same axes, sketch the graph of  $y = f(x - 2)$ .



**[1 mark]**

- 11 This histogram shows the distribution of waiting times for patients at a surgery one Monday.**



- (a) How many patients were seen that Monday?  
[2 marks]**

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

- (b) The surgery states that the range of these waiting times is 50 minutes.**

**Explain why this statement may not be true.**

\_\_\_\_\_

\_\_\_\_\_

**[1 mark]**

**(c) The surgery states that 80% of patients have waiting times of less than 20 minutes.**

**Is this statement correct for patients visiting the surgery that Monday?**

**Show your working clearly.**

**[2 marks]**

**(c)** \_\_\_\_\_



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