

**GENERAL CERTIFICATE OF SECONDARY EDUCATION  
MATHEMATICS C (GRADUATED ASSESSMENT)**

**M8 B248B**

**MODULE M8 – SECTION B**

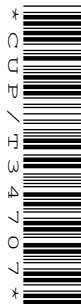
**TUESDAY 13 MARCH 2007**

Morning

Time: 30 minutes

Candidates answer on the question paper.

Additional materials: Geometrical instruments  
Tracing paper (optional)  
Scientific or graphical calculator



Candidate  
Name

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Centre  
Number

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Candidate  
Number

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**INSTRUCTIONS TO CANDIDATES**

- Write your name, Centre Number and Candidate Number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- In many questions marks will be given for a correct method even if the answer is incorrect.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

**INFORMATION FOR CANDIDATES**

- You are expected to use a calculator in Section B of this paper.
- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this Section is 25.
- Section B starts with question 7.
- Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.

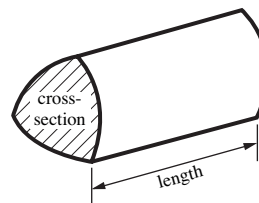
For Examiner's Use

Section B

This document consists of **8** printed pages.

## Formulae Sheet

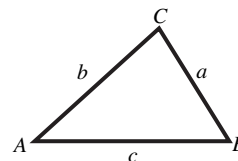
**Volume of prism** = (area of cross-section)  $\times$  length



**In any triangle ABC**

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

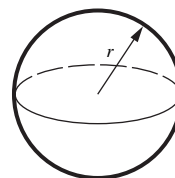
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$



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

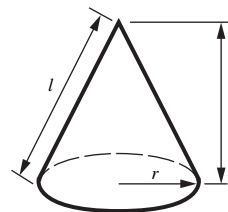
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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

**PLEASE DO NOT WRITE ON THIS PAGE**

7 (a) Solve.

$$\frac{5-x}{4} = 3$$

(a) ..... [2]

(b) Solve.

$$3x - 7 > 5$$

(b) ..... [2]

(c) Solve algebraically these simultaneous equations.

$$\begin{aligned} x + 3y &= 8 \\ 5x - y &= 16 \end{aligned}$$

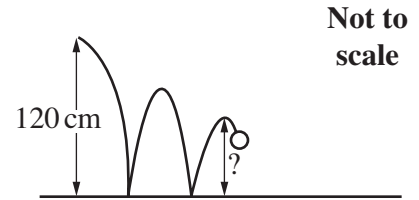
(c)  $x =$  .....

$y =$  ..... [3]

7	
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- 8 (a) Rudi drops a ball from a height of 120 cm. Each time it hits the ground, it rebounds to 70% of its previous height.

Calculate the height of the rebound after it has hit the ground **twice**.



(a) ..... cm [3]

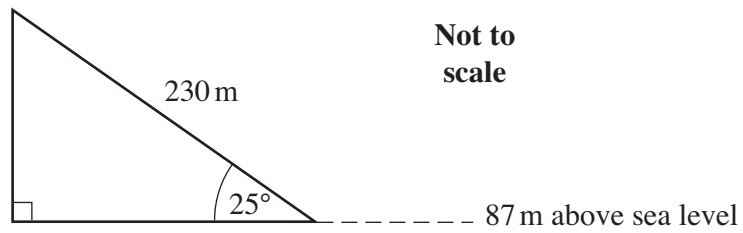
- (b) Rudi bought the ball **before** its price went up by 12%. The price for this ball is **now** £6.16.

How much did Rudi pay for his ball?

(b) £ ..... [3]

6

- 9 A footpath is 230 m long.  
It goes straight up a hill at an angle of  $25^\circ$  to the horizontal.  
The lower end of the footpath is 87 metres above sea level.

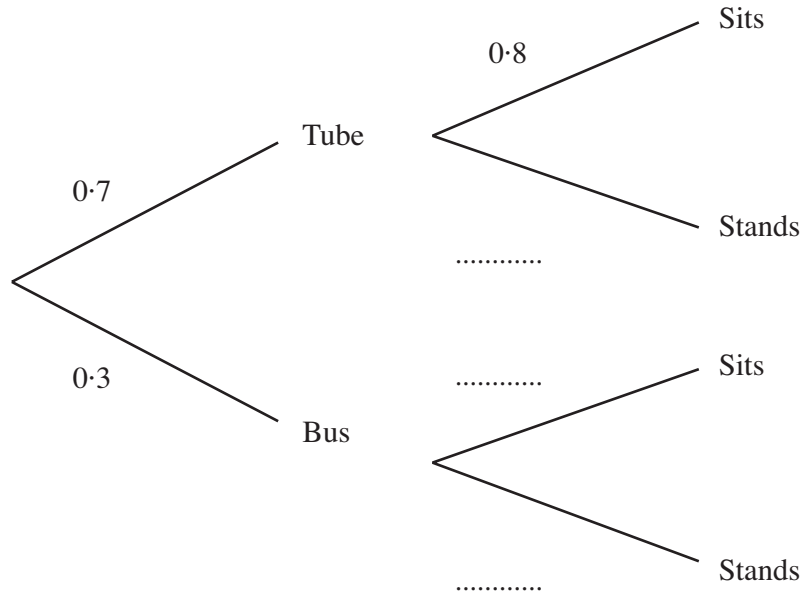


Calculate the height above sea level of the upper end of the footpath.

..... m [4]

4

- 10** Neil travels to work in London either by bus or by tube.  
 The probability that he travels by tube is 0.7.  
 Whichever way he travels, the probability that he gets a seat is 0.8.



- (a)** Complete the tree diagram.

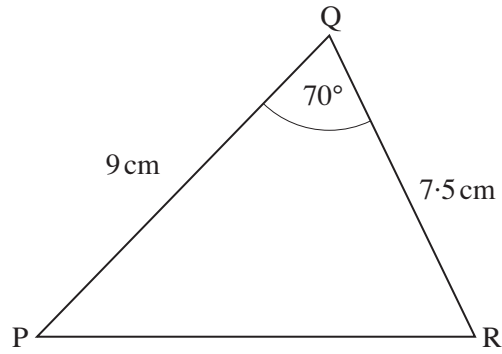
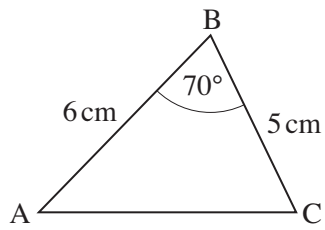
[1]

- (b)** Calculate the probability that on a workday chosen at random,  
 Neil travels by tube and has to stand.

- (b)** ..... [2]

3
---

11



**Not to  
scale**

- (a) Explain how you can tell that triangles ABC and PQR are similar.

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

- (b) Given also that  $PR = 9.5$  cm, calculate the length of AC.  
 Give your answer to a sensible degree of accuracy.

(b) ..... cm [3]

5	
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