

Candidate forename						Candidate surname					
Centre number						Candidate number					

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

B278B

**MATHEMATICS C
(GRADUATED ASSESSMENT)**

MODULE M8 – SECTION B

TUESDAY 1 MARCH 2011: 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

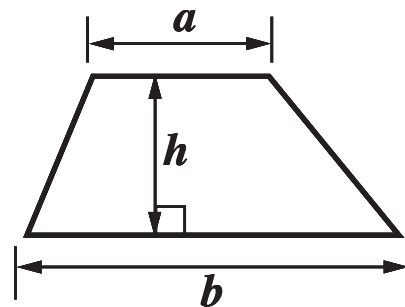
- Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write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

INFORMATION FOR CANDIDATES

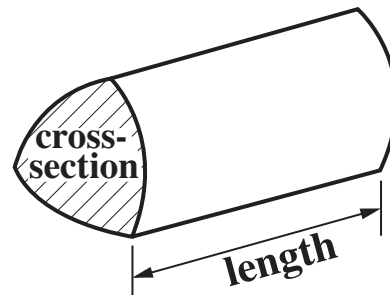
- The number of marks is given in brackets [] at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total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

FORMULAE SHEET

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



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

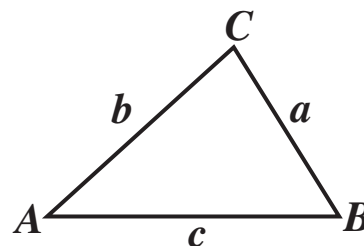


In any triangle ABC

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

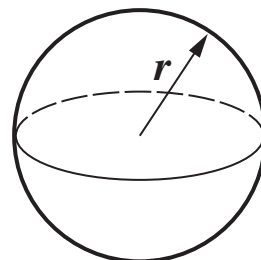
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



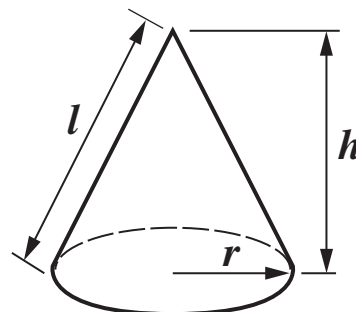
Volume of sphere $= \frac{4}{3}\pi r^3$

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



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

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



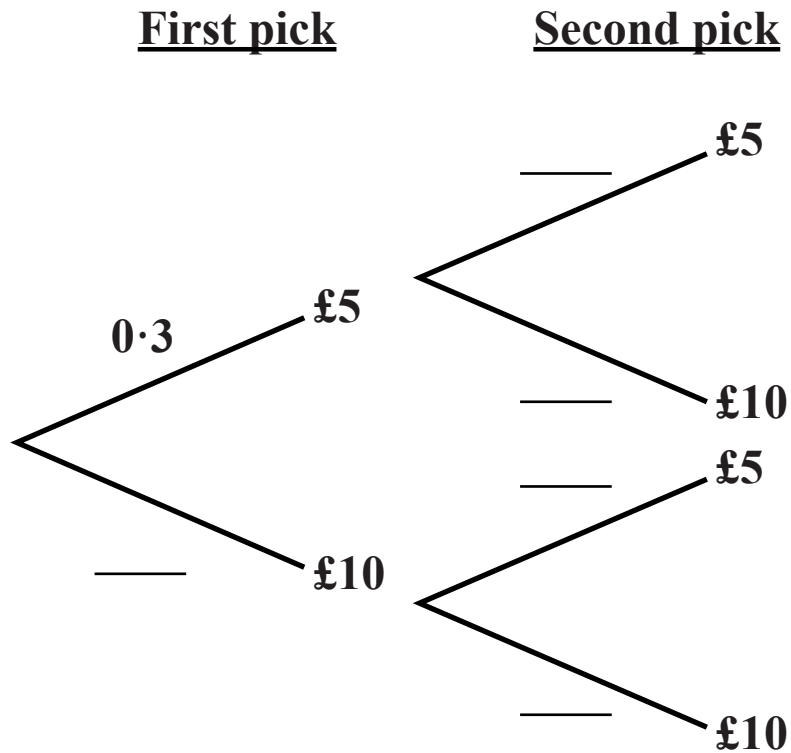
The Quadratic Equation

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 Jaison has only £5 and £10 notes in a money bag. He picks a bank note at random from the money bag and then replaces it before picking a second bank note. The probability that he picks a £5 note is 0.3.

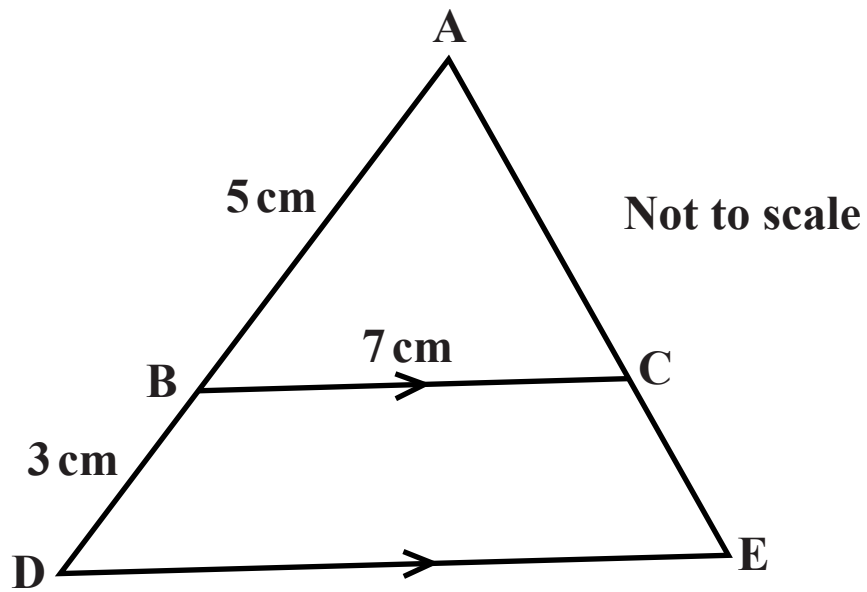
(a) Complete the tree diagram. [2 marks]



(b) Work out the probability that Jaison picks two £10 notes. [2 marks]

(b) _____

9 Triangles ABC and ADE are similar.



Calculate the length DE . [3 marks]

_____ **cm**

10 (a) Solve. [3 marks]

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

(a) _____

(b) Use factorising to solve. [3 marks]

$$x^2 - 11x + 30 = 0$$

(b) _____

11 (a) The Sun has a diameter of 864 000 miles.

Write this distance in standard form. [1 mark]

(a) _____ miles

(b) The Sun has a mass of 1.99×10^{30} kg.

Our planet Earth has a mass of 5.972×10^{24} kg.

How many times bigger is the mass of the Sun than the mass of the Earth?

Give your answer in standard form, correct to 2 significant figures. [3 marks]

(b) _____

12 In 2008, house values in parts of England decreased by an average 2% per month.

On January 1st 2008, one of these houses was valued at £250 000.

On April 1st, 3 months later, the value of this house was given by the formula

$$V = 250\,000 \times m^n,$$

where V is the new value of the house in £.

(a) State the values of m and n . [2 marks]

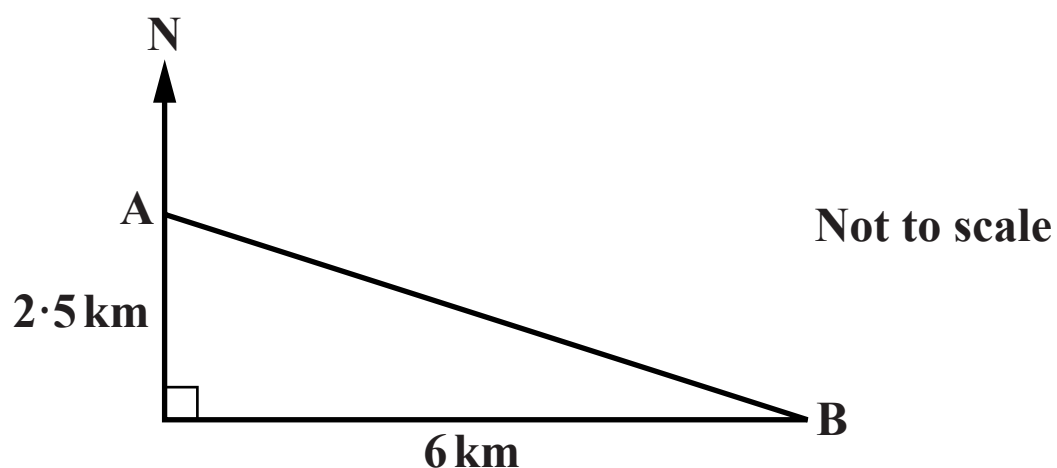
(a) $m =$ _____

$n =$ _____

(b) Find the value of this house on July 1st 2008. [2 marks]

(b) £ _____

- 13** The diagram shows the positions of two boats, A and B. Boat B is 6 km east and 2.5 km south of boat A.



Calculate the bearing of boat B from boat A. [4 marks]

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