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OCR
RECOGNISING ACHIEVEMENT

M8

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C (GRADUATED ASSESSMENT) B278B

MODULE M8 – SECTION B

OCE/25782

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:
- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

Tuesday 1 March 2011
Morning

Duration: 30 minutes

B2788B

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

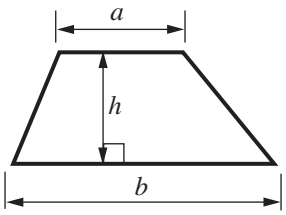
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer 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.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

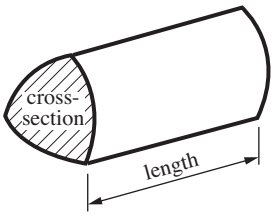
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

Formulae Sheet

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



Volume of prism = (area of cross-section) × length

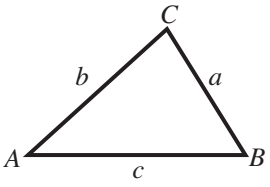


In any triangle ABC

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

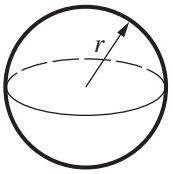
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



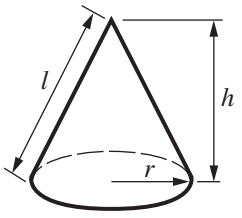
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

Curved surface area of cone = πrl



The Quadratic Equation

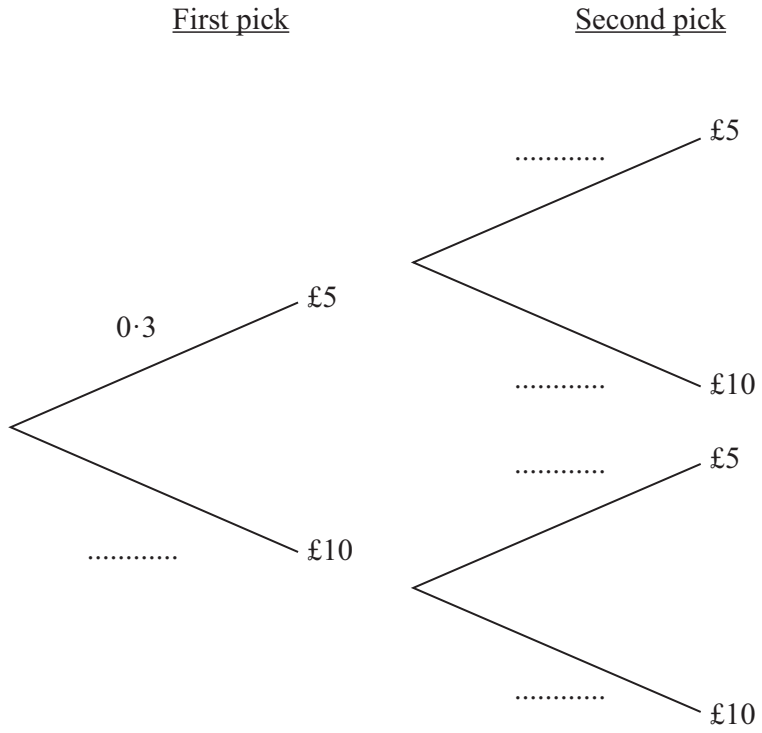
The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

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

PLEASE DO NOT WRITE ON THIS PAGE

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.

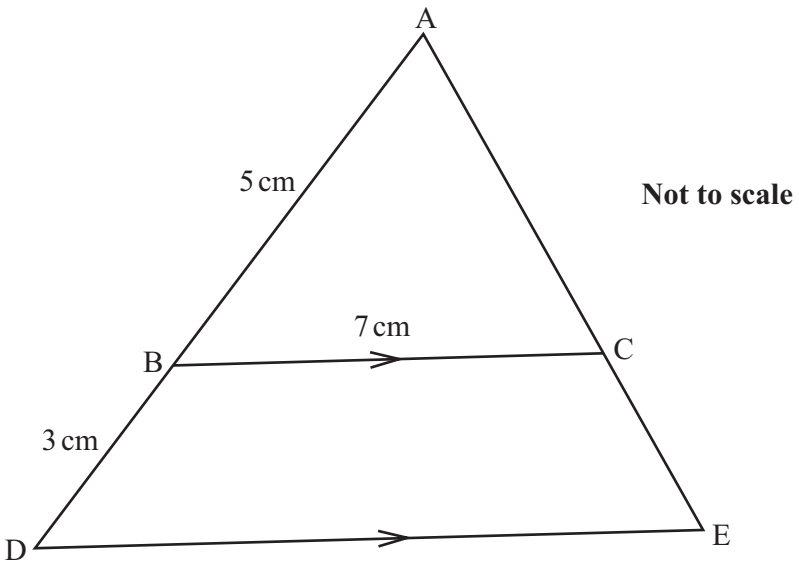


[2]

(b) Work out the probability that Jaison picks two £10 notes.

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

9 Triangles ABC and ADE are similar.



Calculate the length DE.

..... cm **[3]**

10 **(a)** Solve.

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

(a)..... **[3]**

(b) Use factorising to solve.

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

(b) ..... **[3]**

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

Write this distance in standard form.

(a) ..... miles **[1]**

(b) The Sun has a mass of $1{\cdot}99 \times 10^{30}$ kg.
Our planet Earth has a mass of $5{\cdot}972 \times 10^{24}$ 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.

(b) ..... **[3]**

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.

(a) m = ...

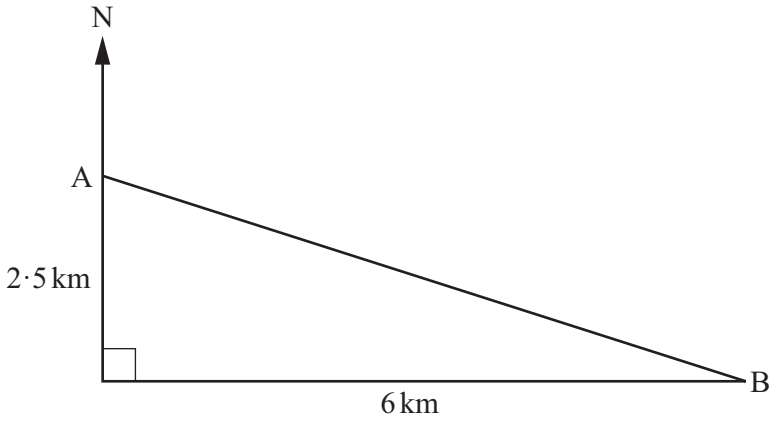
n = ... **[2]**

(b) Find the value of this house on July 1st 2008.

(b) £ ..... **[2]**

TURN OVER FOR QUESTION 13

13



Not to scale

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]**