

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M8 – SECTION B

B278B

Candidates answer on the question paper

OCR Supplied Materials:

None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

Tuesday 23 June 2009
Morning

Duration: 30 minutes



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

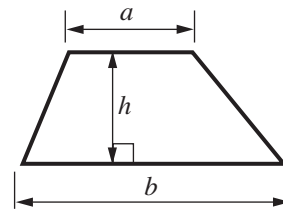
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

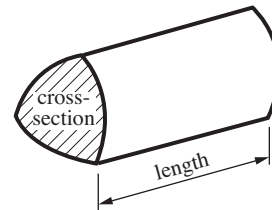
- The number of marks is given in brackets [] at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total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

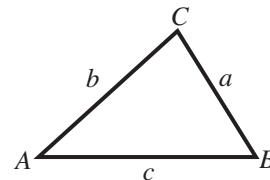


In any triangle ABC

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

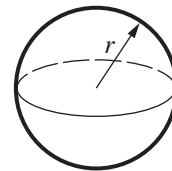
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



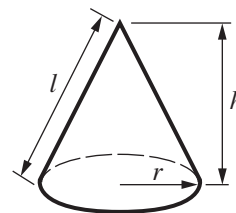
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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

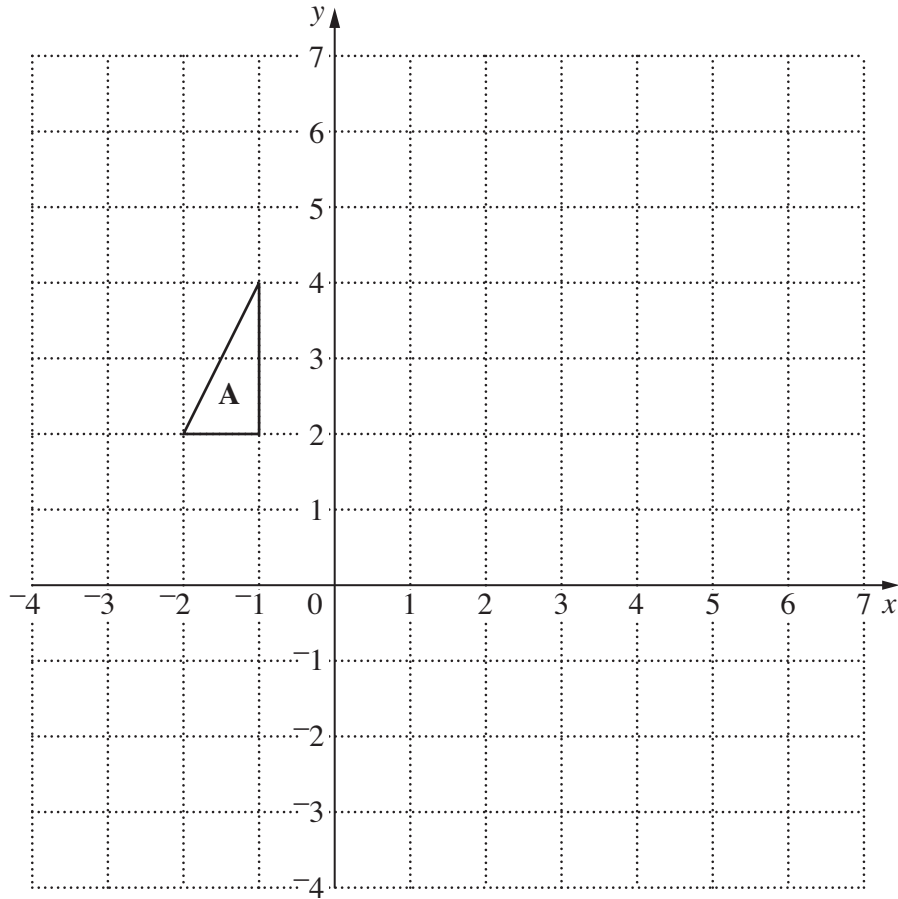


The Quadratic Equation

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



- (a) Rotate triangle **A** through 180° about $(0, 2)$.
Label the image **B**. [2]
- (b) Translate your image **B** by $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$.
Label the new image **C**. [2]
- (c) Describe fully the **single** transformation which maps triangle **A** onto triangle **C**.

.....

..... [2]

- 9 Rearrange this formula to make x the subject.

$$y = \frac{x + 4}{2}$$

..... [2]

- 10 The price of a laptop including VAT is £493.50.
The VAT rate is 17.5%.

Work out the price of the laptop before VAT is added.

£ [3]

- 11** Ashfield School sells tickets for a show.
The school sells a adult tickets and c child tickets.
Altogether the school sells 370 tickets.

This can be written as an equation.

$$a + c = 370$$

- (a)** Each adult ticket costs £8 and each child ticket costs £5.
The total takings are £2300.

Write down an equation to represent this information.

.....

[1]

- (b)** Solve algebraically the simultaneous equations to find the values of a and c .

(b) $a =$

$c =$ [3]

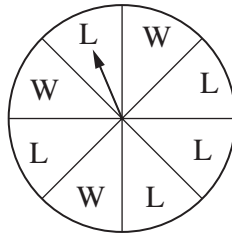
- 12 The temperature of the liquid in a beaker is 95°C .
The liquid is cooled.
Each minute, the temperature of the liquid is reduced by 4% of its temperature at the beginning of that minute.

What will the temperature be after 5 minutes?

..... $^{\circ}\text{C}$ [3]

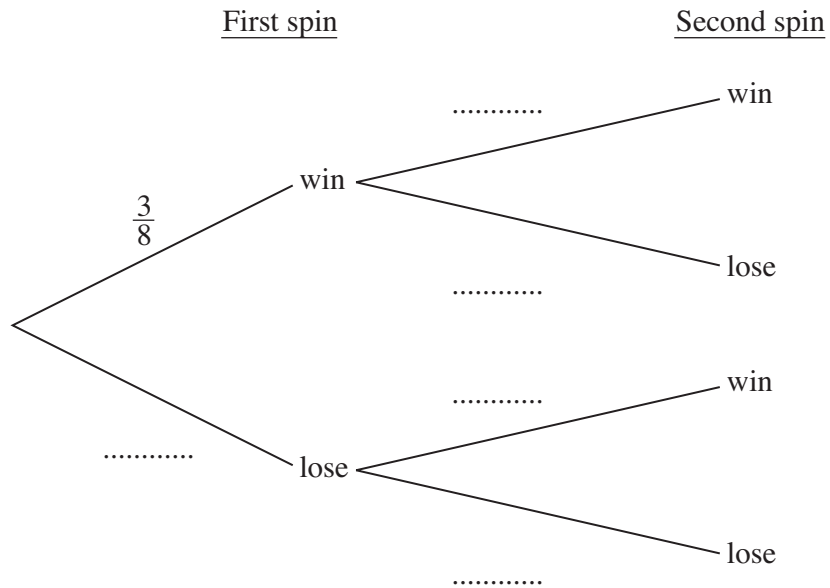
13 One of the stalls at a fair is a spinner game.

There is an equal probability of the pointer stopping on each of the 8 sectors. A player wins if the pointer stops on a sector labelled W and loses otherwise.



Marta spins the pointer once, then spins it again.

(a) Complete the tree diagram to show the possible outcomes.



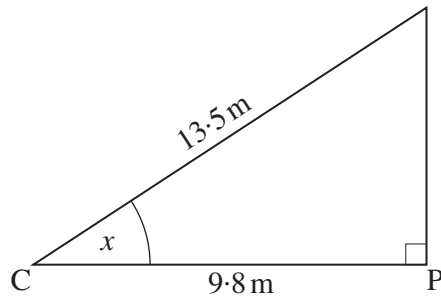
[2]

(b) Work out the probability that Marta loses on both spins.

(b) [2]

TURN OVER FOR QUESTION 14

- 14 Carl is flying a kite. The line is 13.5 m long.
Pete is standing directly under the kite and is 9.8 m from Carl.



Not to scale

Calculate x , the angle of elevation of the kite from Carl.

..... ° [3]

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