OCR
RECOGNISING ACHIEVEMENT

M8

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C (GRADUATED ASSESSMENT) B278B

MODULE M8 – SECTION B

OCE/T64046

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

B278B

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

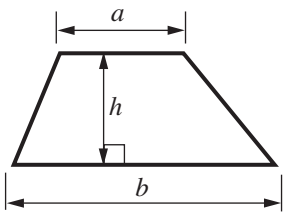
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. 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

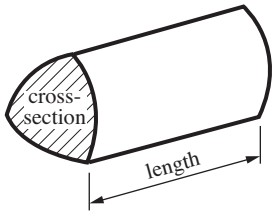
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.
- The 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) × length

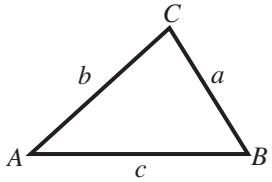


In any triangle ABC

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

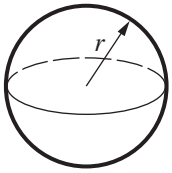
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



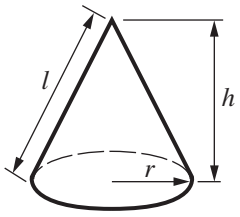
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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



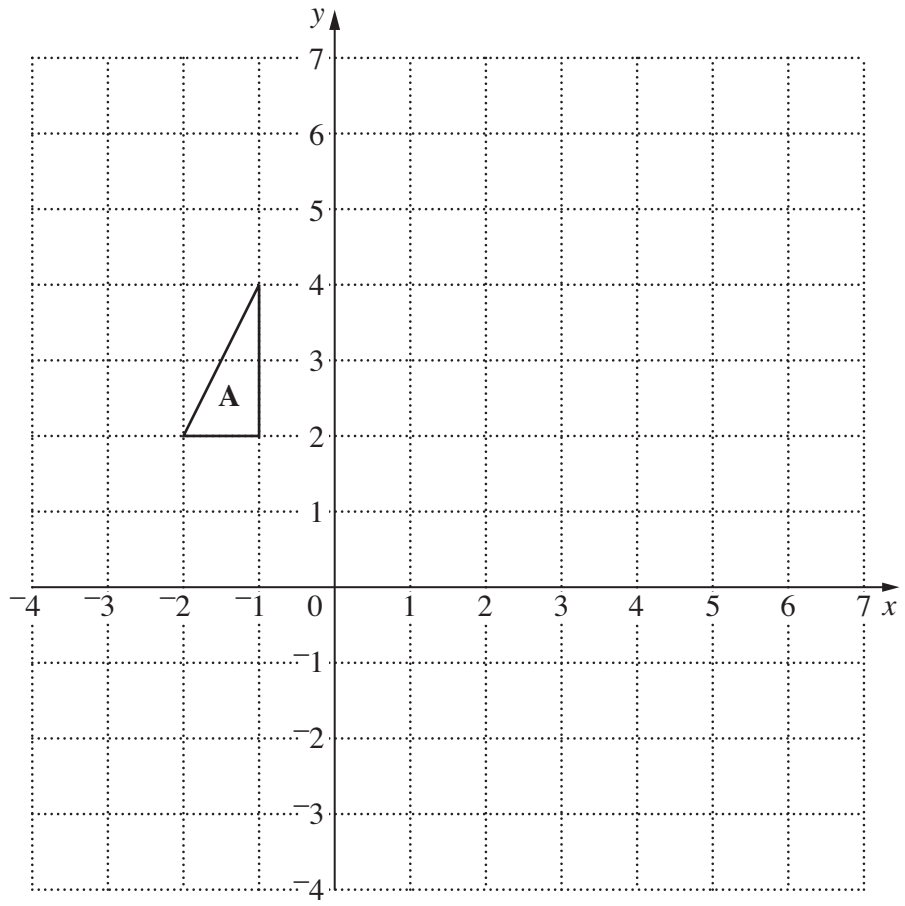
The Quadratic Equation

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

8



(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]**

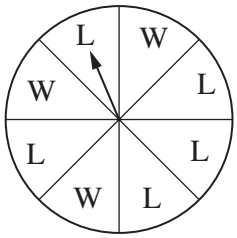
12 The temperature of the liquid in a beaker is 95 °C.
The liquid is cooled.
Each minute, the temperature of the liquid is reduced by 4% of its temperature at the beginning of that minute.

What will the temperature be after 5 minutes?

..... °C **[3]**

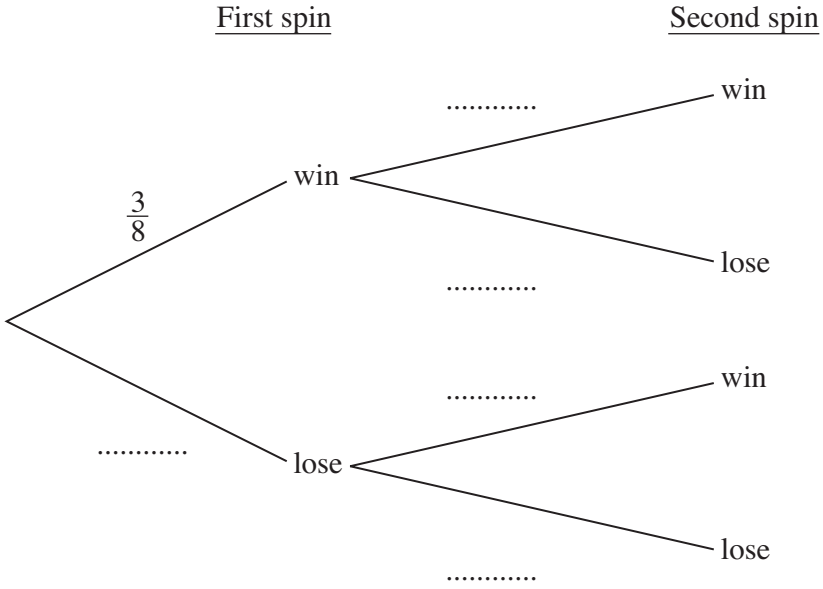
13 One of the stalls at a fair is a spinner game.

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.



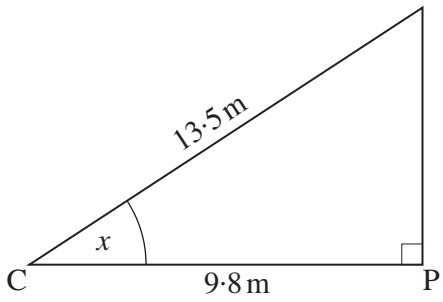
[2]

(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]**