

Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

B278B

**MATHEMATICS C
(GRADUATED ASSESSMENT)**

MODULE M8 – SECTION B

TUESDAY 23 JUNE 2009: 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

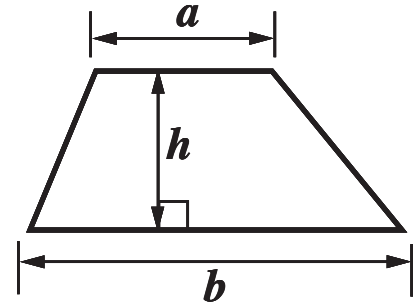
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer ALL the questions.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

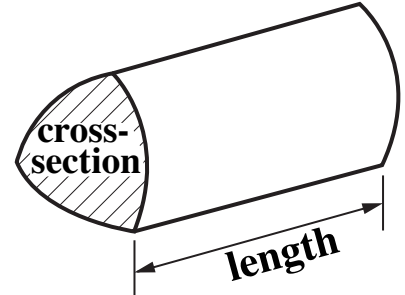
- The number of marks is given in brackets [] at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total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

FORMULAE SHEET

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



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

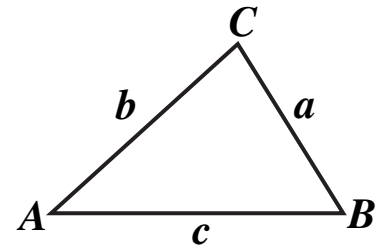


In any triangle ABC

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

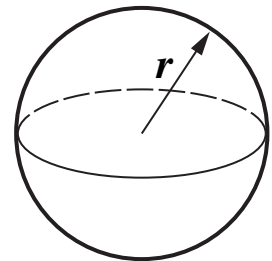
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



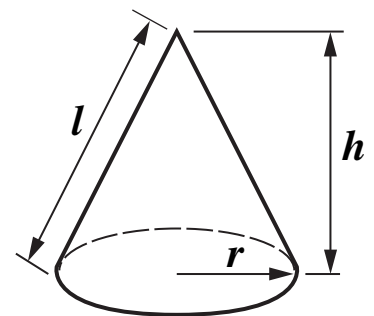
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

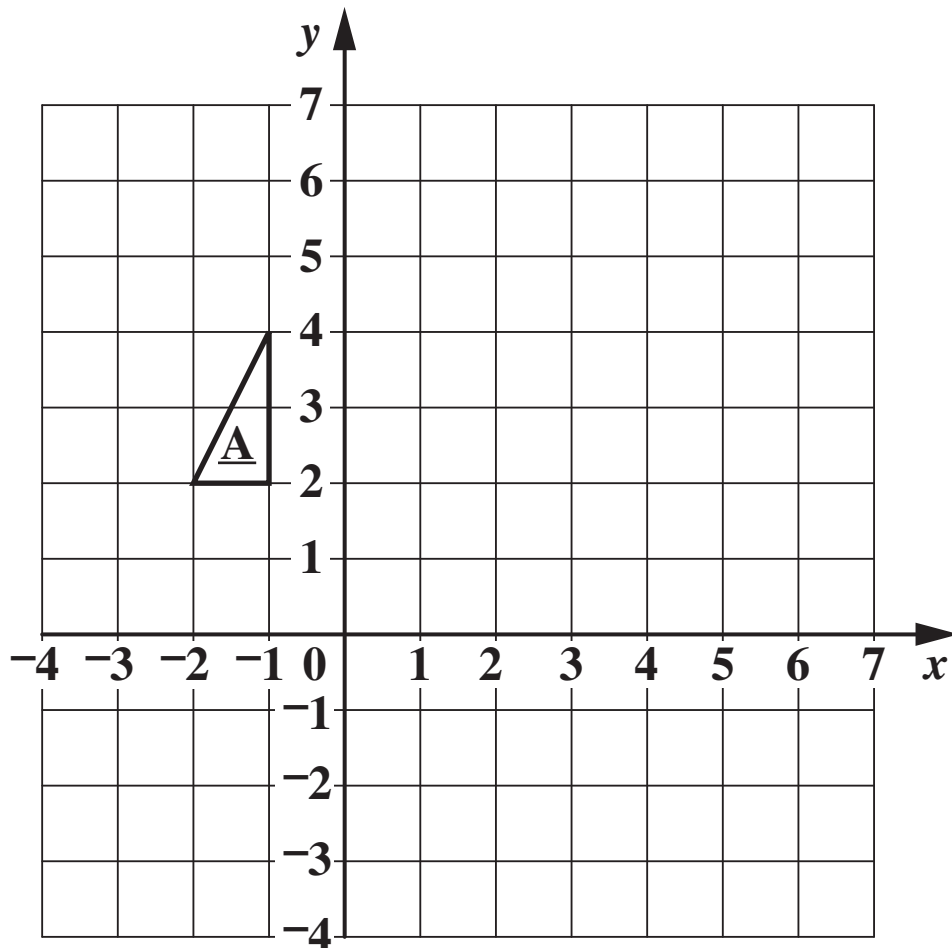
Curved surface area of cone = $\pi r l$



The Quadratic Equation

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

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



- (a) Rotate triangle A through 180° about $(0, 2)$.
Label the image B.

[2 marks]

- (b) Translate your image B by $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$.
Label the new image C.

[2 marks]

- (c) Describe fully the SINGLE transformation which maps triangle A onto triangle C.

[2 marks]

9 Rearrange this formula to make x the subject.

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

[2 marks]

**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 marks]**

£ _____

- 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 mark]

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

(b) $a =$ _____

$c =$ _____

**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.**

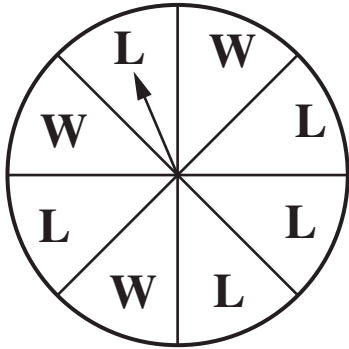
**What will the temperature be after 5 minutes?
[3 marks]**

_____ $^{\circ}\text{C}$

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

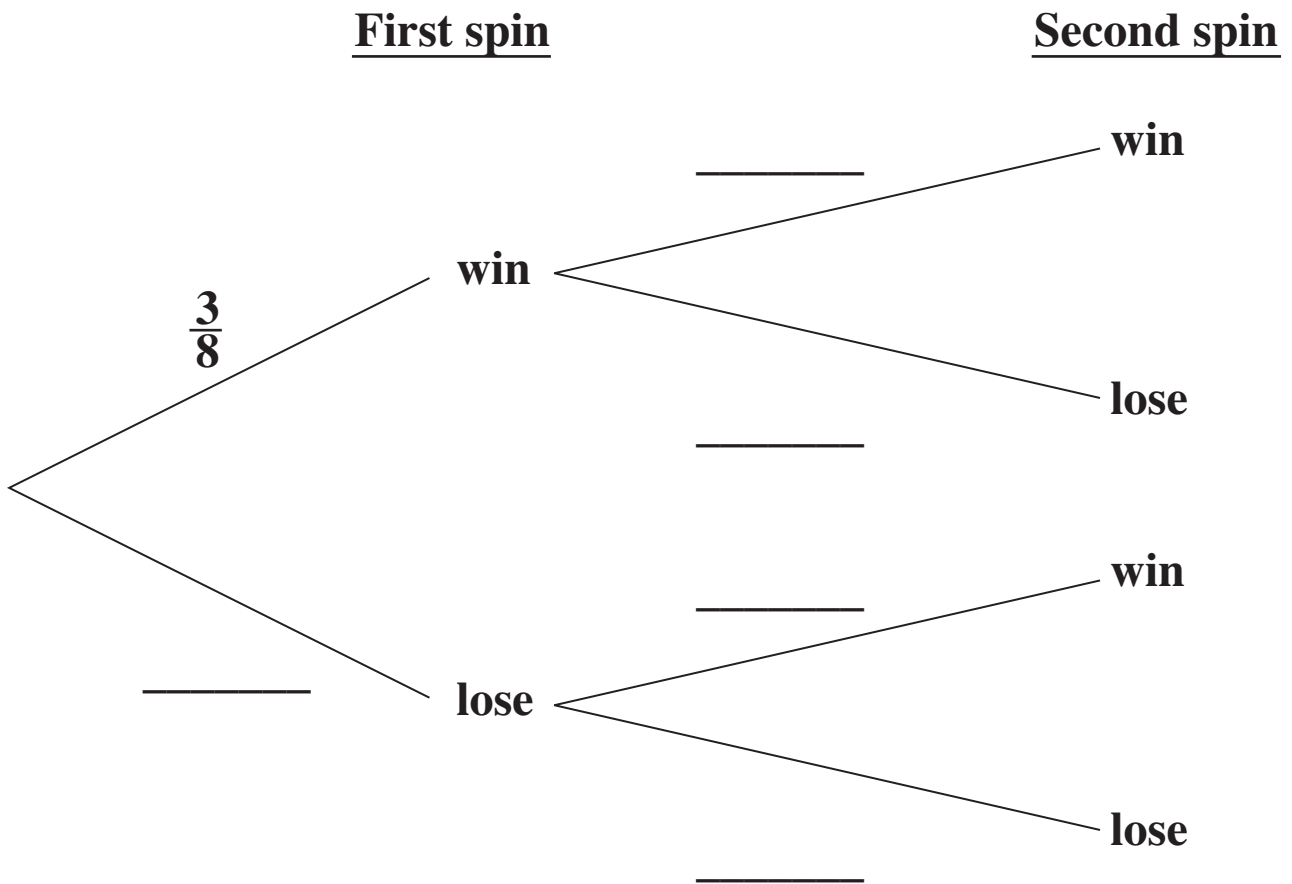
There is an equal probability of the pointer stopping on each of the 8 sectors.

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.

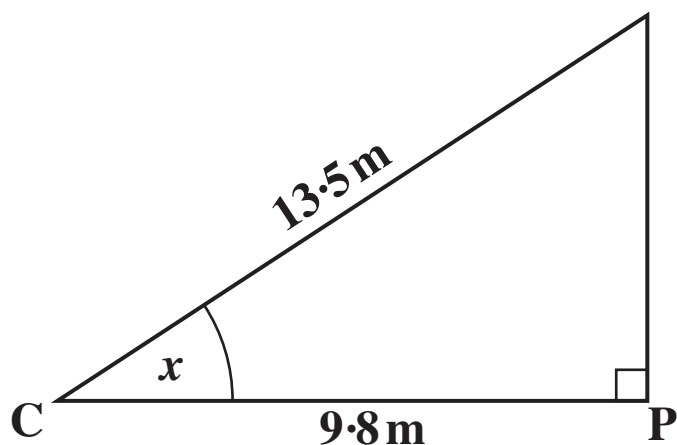


[2 marks]

**(b) Work out the probability that Marta loses on both spins.
[2 marks]**

(b) _____

- 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 marks]

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