Candidate Forename		Candidate Surname	

Centre Number					Candidate Number				

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION

B279A

MATHEMATICS C (GRADUATED ASSESSMENT)

MODULE M9 – SECTION A

MONDAY 21 JUNE 2010: Afternoon
DURATION: 30 minutes

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the Question Paper

<u>OCR SUPPLIED MATERIALS:</u>

None

<u>OTHER MATERIALS REQUIRED:</u>

Geometrical instruments
Tracing paper (optional)

> ## <u>WARNING</u>
> ### No calculator can be used for Section A of this paper.

## <u>READ INSTRUCTIONS OVERLEAF</u>

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 <u>ALL</u> the questions.

- 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).
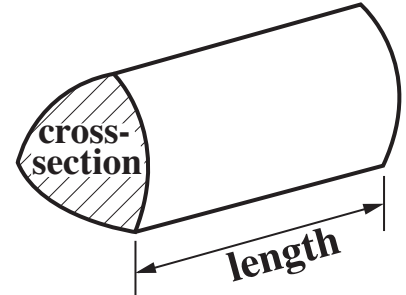
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.

- The total number of marks for this Section is <u>25</u>.

FORMULAE SHEET

Area of trapezium $= \frac{1}{2}(a+b)h$
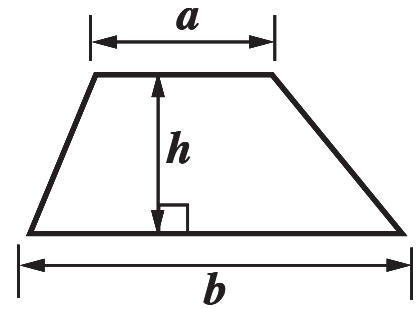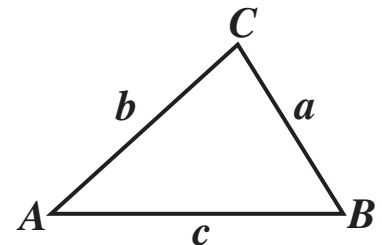
Volume of prism = (area of cross-section) × length

In any triangle *ABC*

Sine rule $\quad \dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$
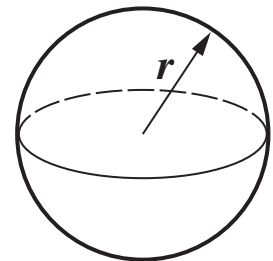
Cosine rule $\quad a^2 = b^2 + c^2 - 2bc \cos A$

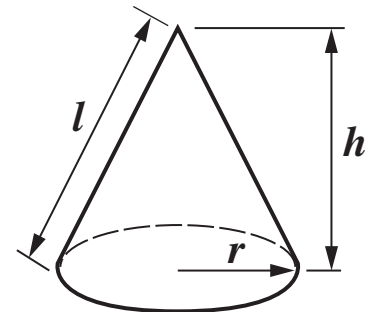**Area of triangle** $= \frac{1}{2} ab \sin C$

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

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

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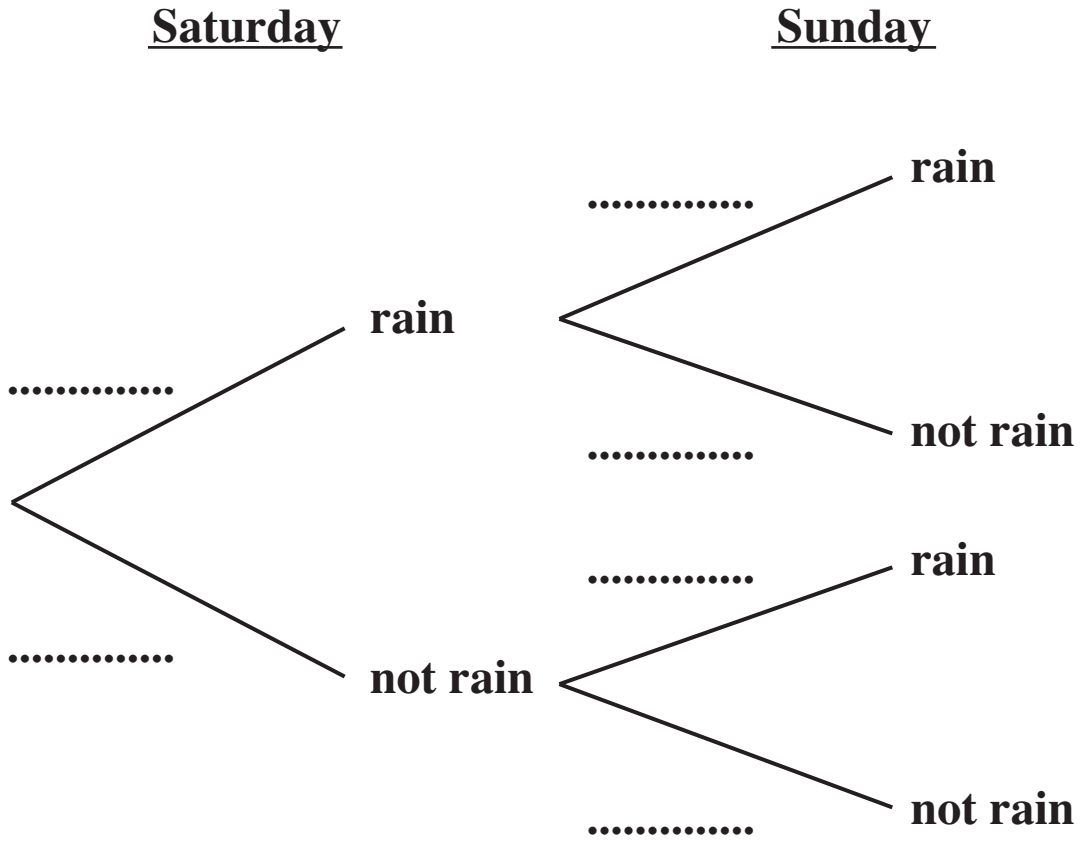
Curved surface area of cone $= \pi r l$

The Quadratic Equation

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

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

1   A weather forecast states the probability of rain for
    Saturday as 0·4 and for Sunday as 0·3.
    These probabilities are independent.

    (a) Complete the tree diagram.
         [1 mark]

<u>Saturday</u>   <u>Sunday</u>

```
                                              rain
                            ...........
               rain
...........
                            ...........
                                              not rain


                            ...........       rain
           not rain
...........
                            ...........       not rain
```

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(b) Calculate the probability that it rains on <u>JUST ONE</u> of the two days.
[3 marks]

(b) _____

2 **Work out.**

(a) $5^2 \times 5^{-2}$

(a) _____

[2 marks]

(b) $\left(\dfrac{5^9}{5^5}\right)^{\frac{1}{2}}$

(b) _____

[2 marks]

6

3 The cost of a circular lace mat, C euros, is proportional to the square of the radius, r cm.

$C = 80$ when $r = 4$.

(a) Find an equation connecting C and r.
[2 marks]

(a) _____

(b) Find the cost of a mat with radius 7 cm.
[1 mark]

(b) _____ euros

4 The total world land area is $5 \cdot 8 \times 10^7$ square miles, correct to 2 significant figures.
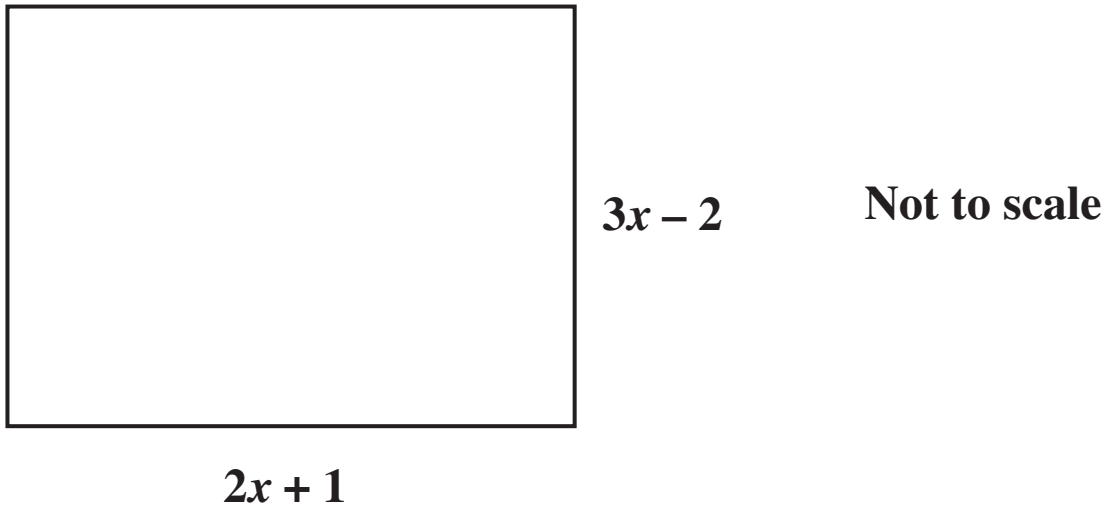The land area of Australia is $2 \cdot 9 \times 10^6$ square miles, correct to 2 significant figures.

Estimate the percentage of the total world land area covered by Australia.
Show your working clearly.
[3 marks]

_____ %

5 The length and width of this rectangle are in centimetres.
The length is $2x + 1$ and the width is $3x - 2$.

3x − 2   Not to scale

2x + 1

(a) Expand and simplify.

$(2x + 1)(3x - 2)$

(a) _____

[2 marks]

(b) The area of the rectangle is $33 \, \text{cm}^2$.

    (i) Show that $6x^2 - x - 35 = 0$.
       [1 mark]

    _____

    _____

    (ii) Solve, by factorising.

       $6x^2 - x - 35 = 0$

                                                    (b)(ii) _____

    [3 marks]

    (iii) Hence find the length and width of the rectangle.
        [1 mark]

                                    (iii) length _____ cm

                                         width _____ cm

6   **Use the diagram below to answer the questions that follow.**

Not to scale
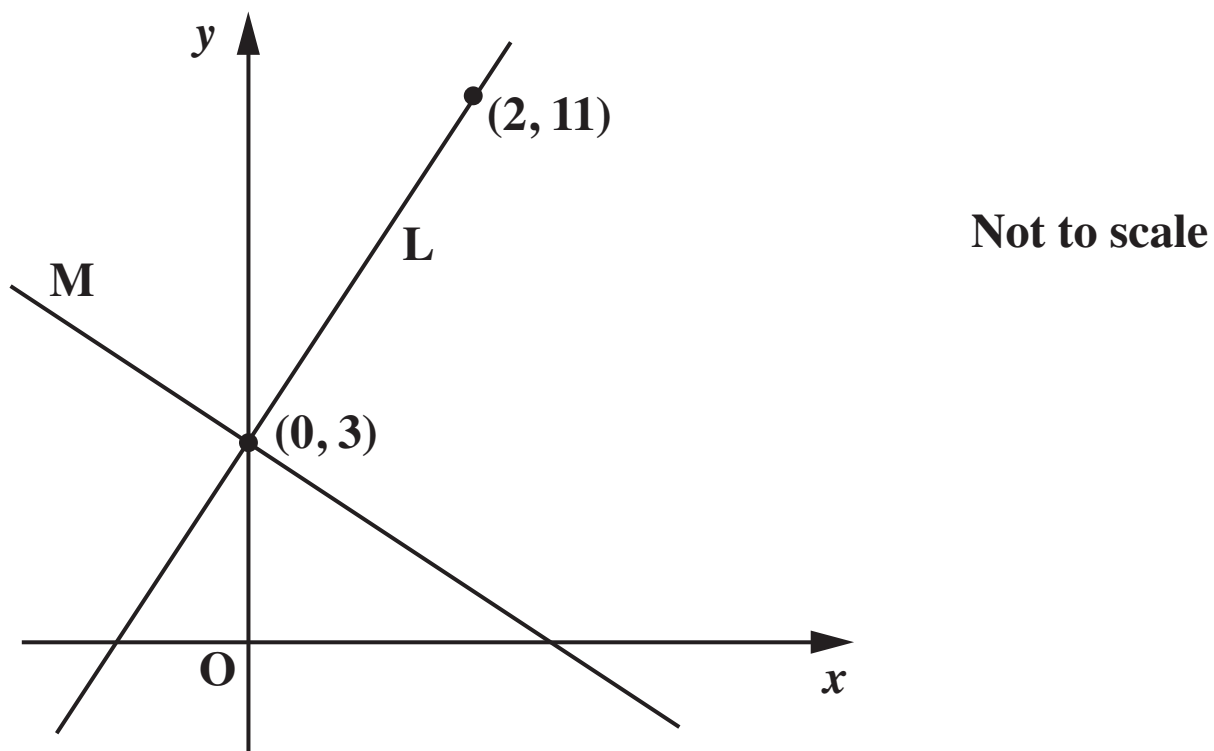
(a) **Explain why the equation of line L is $y = 4x + 3$.**
[2 marks]

_____

_____

_____

(b) **Line M is perpendicular to line L and passes through $(0, 3)$.**

Find the equation of line M.
[2 marks]

(b) _____

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