

Candidate forename						Candidate surname					
Centre number						Candidate number					

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

B280A

**MATHEMATICS C
(GRADUATED ASSESSMENT)**

MODULE M10 – SECTION A

TUESDAY 1 MARCH 2011: 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)

WARNING

**No calculator can be used for
Section A of this paper.**

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

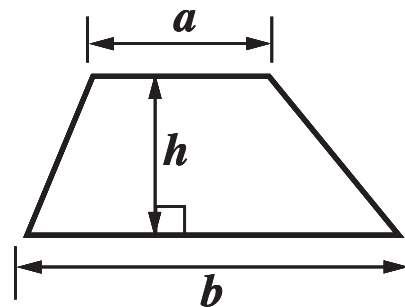
- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**
- **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.**

INFORMATION FOR CANDIDATES

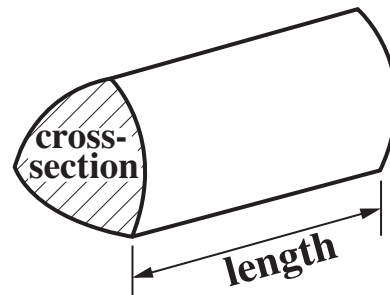
- **The number of marks is given in brackets [] at the end of each question or part question.**
- **The total number of marks for this Section is 25.**

FORMULAE SHEET

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



Volume of prism $= (\text{area of cross-section}) \times \text{length}$

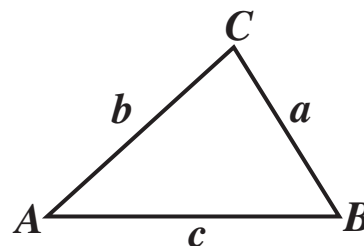


In any triangle ABC

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

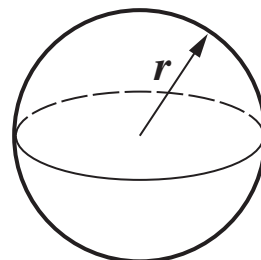
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



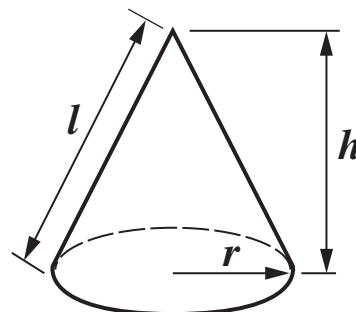
Volume of sphere $= \frac{4}{3}\pi r^3$

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

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

1 Factorise and simplify. [3 marks]

$$\frac{x^2 - 6x + 8}{3x^2 - 12}$$

- 2 (a) Simplify $\sqrt{180}$. Give your answer in the form $a\sqrt{5}$. [2 marks]**

(a) _____

- (b) Expand and simplify.**

$$(2 + \sqrt{3})(7 - \sqrt{3})$$

Give your answer in the form $c + d\sqrt{3}$. [2 marks]

(b) _____

3 Solve algebraically these simultaneous equations. [6 marks]

$$y = 2x^2 - 5x - 1$$

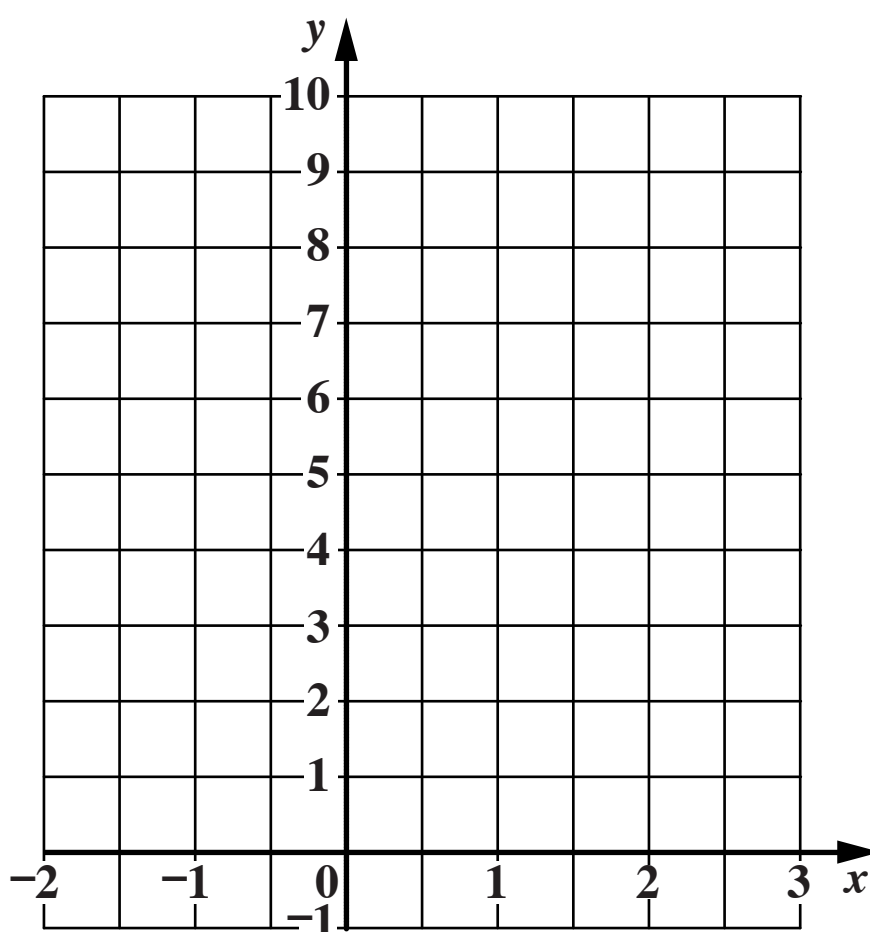
$$y = 2x - 4$$

$$x = \underline{\hspace{2cm}}, y = \underline{\hspace{2cm}}$$

$$\text{or } x = \underline{\hspace{2cm}}, y = \underline{\hspace{2cm}}$$

- 4 (a) Draw the graph of $y = 2^x$ for values of x from -2 to 3 .
[3 marks]

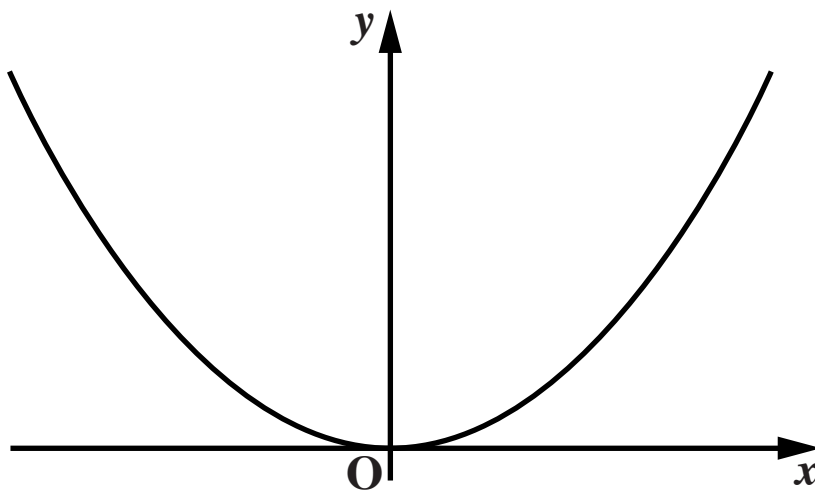
x	-2	-1	0	1	2	3
y						



- (b) Use your graph to find an approximate solution of the equation $2^x = 5$. [1 mark]

(b) _____

- 5** This is a sketch of the graph of $y = 2x^2$.

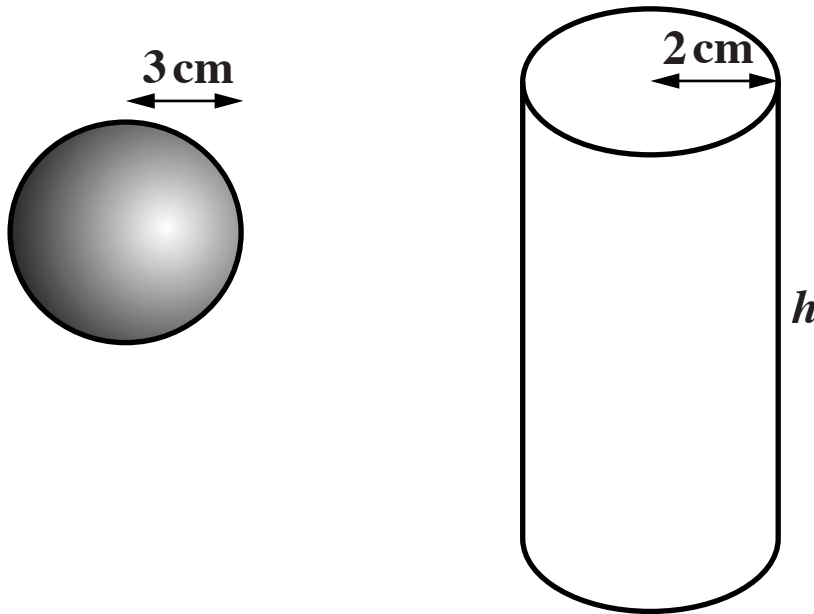


- (a) On the same axes, sketch the graph of $y = x^2$. [1 mark]
- (b) The graph of $y = 2x^2$ is translated by $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$.

Write the equation of the resulting graph. [2 marks]

(b) _____

- 6** A solid metal sphere of radius 3 cm is melted and recast as a cylinder of radius 2 cm.
No metal is wasted, so the volumes are the same.



Calculate the height of the cylinder.
Show your method clearly.
Do not substitute a number for π in your calculations.
[5 marks]

_____ cm

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