

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M10 – SECTION A

B280A

Candidates answer on the question paper.

OCR supplied materials:

None

Other materials required:

- Geometrical instruments
- Tracing paper (optional)

Tuesday 1 March 2011
Morning

Duration: 30 minutes



Candidate
forename

Candidate
surname

Centre number

Candidate number

MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. 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.
- Do **not** write in the bar codes.

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**.
- This document consists of **8** pages. Any blank pages are indicated.

WARNING

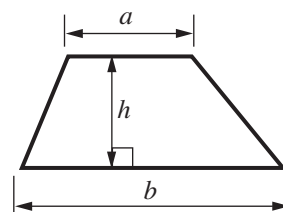


No calculator can be
used for Section A of
this paper

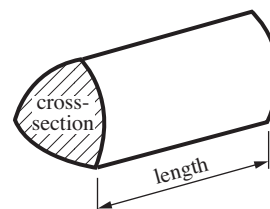


Formulae Sheet

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



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

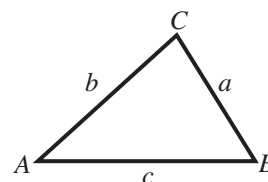


In any triangle ABC

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

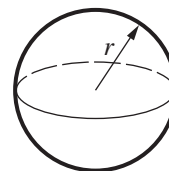
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



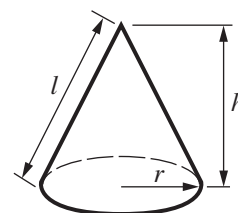
Volume of sphere = $\frac{4}{3}\pi r^3$

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

- 1 Factorise and simplify.

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

.....[3]

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

(a)[2]

- (b) Expand and simplify.

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

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

(b)[2]

3 Solve algebraically these simultaneous equations.

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

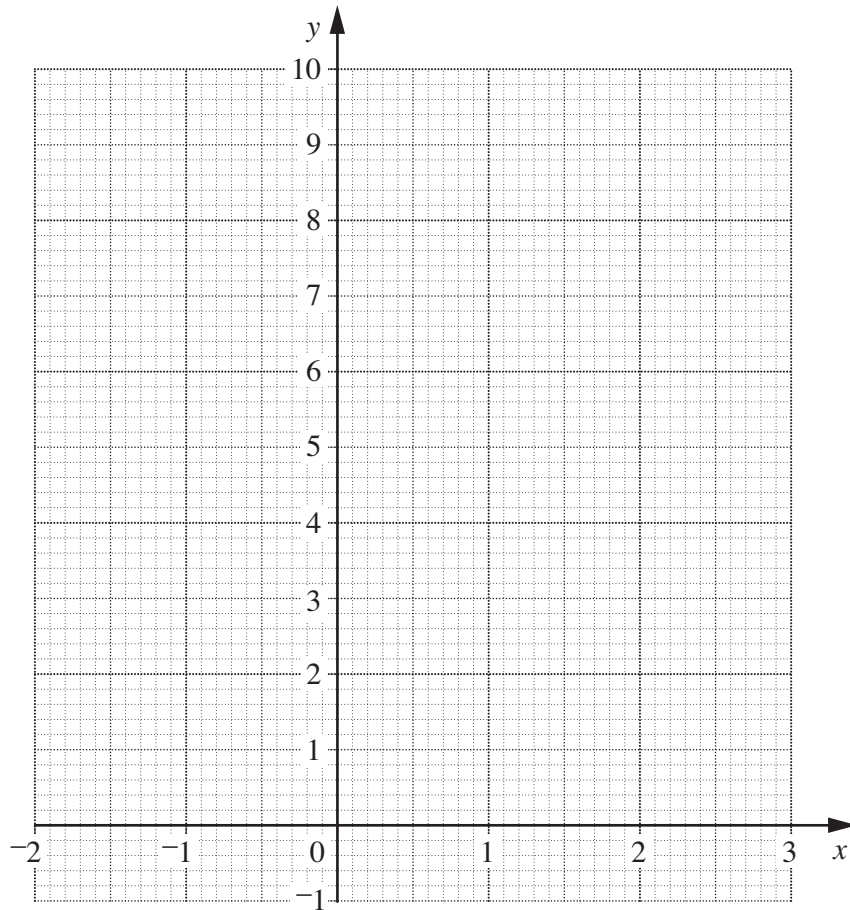
$$y = 2x - 4$$

$$x = \dots\dots\dots, y = \dots\dots\dots$$

$$\text{or } x = \dots\dots\dots, y = \dots\dots\dots[6]$$

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

x	-2	-1	0	1	2	3
y						



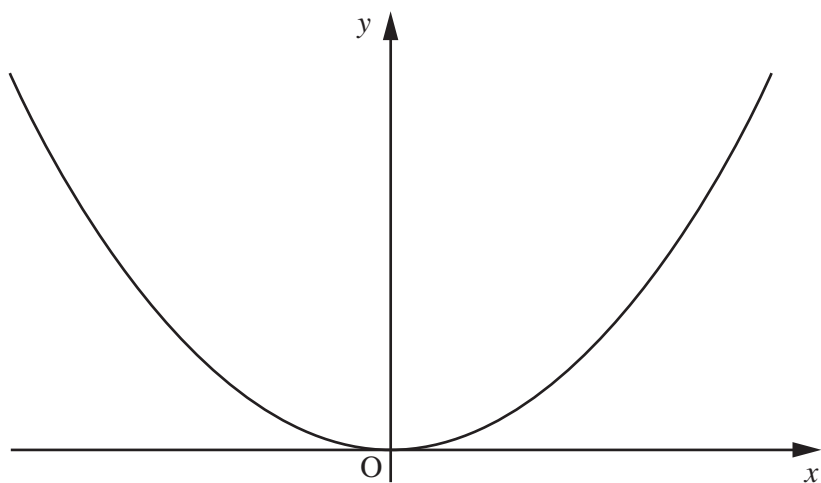
[3]

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

(b) [1]

5

6



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

(a) Sketch the graph of $y = x^2$ on the same axes.

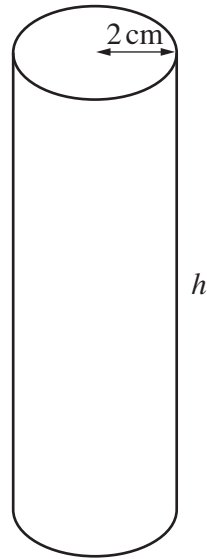
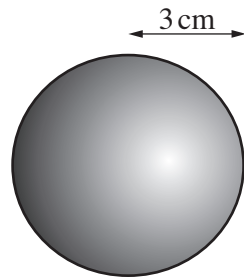
[1]

(b) The graph of $y = 2x^2$ is translated by $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$.

Write the equation of the resulting graph.

(b) [2]

- 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.

..... cm [5]

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