



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

CANDIDATE  
NAME

CENTRE  
NUMBER

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**CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/21**

Paper 2 (Extended)

**May/June 2012**

**45 minutes**

Candidates answer on the Question Paper

Additional Materials: Geometrical Instruments

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

Do not use staples, paper clips, highlighters, glue or correction fluid.

You may use a pencil for any diagrams or graphs.

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** the questions.

**CALCULATORS MUST NOT BE USED IN THIS PAPER.**

All answers should be given in their simplest form.

You must show all the relevant working to gain full marks and you will be given marks for correct methods even if your answer is incorrect.

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

The total number of marks for this paper is 40.

<b>For Examiner's Use</b>

This document consists of **8** printed pages.



## Formula List

For the equation

$$ax^2 + bx + c = 0$$

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

Curved surface area,  $A$ , of cylinder of radius  $r$ , height  $h$ .

$$A = 2\pi rh$$

Curved surface area,  $A$ , of cone of radius  $r$ , sloping edge  $l$ .

$$A = \pi rl$$

Curved surface area,  $A$ , of sphere of radius  $r$ .

$$A = 4\pi r^2$$

Volume,  $V$ , of pyramid, base area  $A$ , height  $h$ .

$$V = \frac{1}{3}Ah$$

Volume,  $V$ , of cylinder of radius  $r$ , height  $h$ .

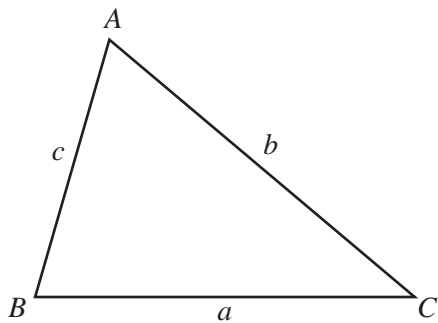
$$V = \pi r^2 h$$

Volume,  $V$ , of cone of radius  $r$ , height  $h$ .

$$V = \frac{1}{3}\pi r^2 h$$

Volume,  $V$ , of sphere of radius  $r$ .

$$V = \frac{4}{3}\pi r^3$$



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

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

$$\text{Area} = \frac{1}{2}bc \sin A$$

3

Answer **all** the questions.

1 Solve the simultaneous equations.

$$x - 2y = 7$$

$$x + 2y = 3$$

Answer  $x =$  .....

Answer  $y =$  ..... [2]

2 A bus leaves Afford at 07 55.  
It travels 15 km to Beetown at a speed of 50 km/h.

Find the time the bus arrives in Beetown.

Answer ..... [3]

3 The area of a semicircle is given by the formula

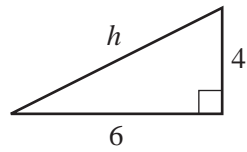
$$A = \frac{\pi r^2}{2}.$$

Make  $r$  the subject of the formula.

Answer  $r =$  ..... [3]

4

4 (a)

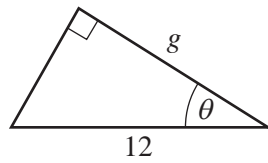


NOT TO  
SCALE

Find the exact value of  $h$ .

Answer(a) ..... [2]

(b)



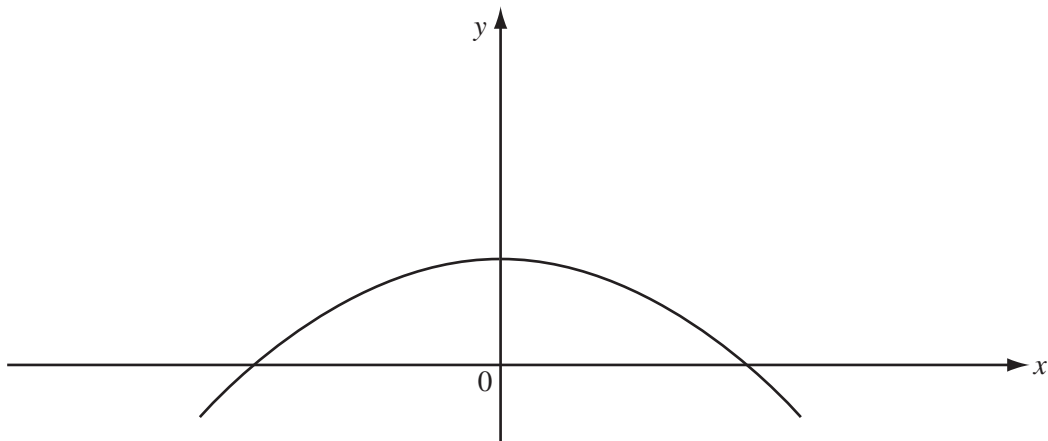
NOT TO  
SCALE

$$\sin \theta = \frac{2}{3}, \quad \cos \theta = \frac{\sqrt{5}}{3}, \quad \tan \theta = \frac{2}{\sqrt{5}}.$$

Find the exact value of  $g$ .

Answer(b) ..... [2]

5



The sketch shows the graph of  $y = f(x)$ .

Using the same axes, sketch the graph of  $y = 2f(x)$ . [2]

6 (a) Find the two possible values of  $|x + y|$  when  $x^2 = 4$  and  $y = 1$ .

Answer(a) ..... , ..... [2]

(b) Expand and simplify  $(\sqrt{2} + 1)(3\sqrt{2} - 1)$ .

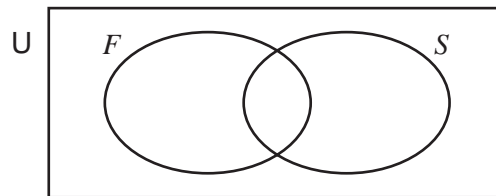
Answer(b) ..... [2]

7 Sara records some information about the number of cars in a car park.

$U = \{\text{cars in the car park}\}$

$F = \{\text{5-door cars}\}$

$S = \{\text{silver cars}\}$



You may use the Venn diagram to help you answer the following questions.

(a)  $n(U) = 12$ ,  $n(F) = 7$ ,  $n(F \cap S) = 2$ ,  $n(F \cup S) = 11$ .

Find

(i)  $n(S)$ ,

Answer(a)(i) ..... [1]

(ii)  $n(S \cup F')$ .

Answer(a)(ii) ..... [1]

(b) Sara chooses a car from the car park at random.

Find the probability that it is a 5-door car.

Answer(b) ..... [1]

(c) Sara chooses a silver car at random.

Find the probability that it is a 5-door car.

Answer(c) ..... [1]

8 Factorise completely.

(a)  $x^2 + 2x - 48$

Answer(a) ..... [2]

(b)  $xy + 2xz - 3y - 6z$

Answer(b) ..... [2]

9  $y \propto \frac{1}{\sqrt{x}}$

When  $x = 4, y = 3$ .

Find  $y$  when  $x = 25$ .

Answer ..... [3]

7

10 The first five terms of a sequence are

-2, 1, 6, 13, 22.

(a) Write down the next term in the sequence.

Answer(a) ..... [1]

(b) Find an expression, in terms of  $n$ , for the  $n$ th term of the sequence.

Answer(b) ..... [3]

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11 Two mathematically similar containers have heights of 3 cm and 6 cm.  
The larger container, when full, can hold 320 ml of water.

Calculate how much water the smaller container can hold when full.

Answer ..... ml [2]

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Question 12 is on the next page.

12 (a) (i)  $3^p = 81$

Write down the value of  $p$ .

Answer(a)(i) ..... [1]

(ii)  $2^q = \frac{1}{8}$

Write down the value of  $q$ .

Answer(a)(ii) ..... [1]

(b)  $\log y = 2 \log 3 + 5 \log 2$

Find the value of  $y$ .

Answer(b) ..... [3]