



# UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

#### **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.

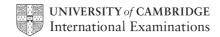
You must show all the relevant working to gain full marks and you will be given marks for correct methods even if your answer is incorrect.

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.

For Examiner's Use

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.

$$A = \pi r l$$

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.

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

а

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

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

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

Answer	all	the	questions.

For Examiner's Use

1 Solve the simultaneous equations.

$$x - 2y = 7$$
$$x + 2y = 3$$

$$Answer x =$$

$$Answer y =$$
 [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.

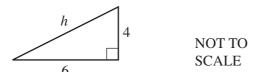
Answer [3]

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]

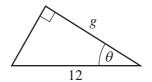
(a)



Find the exact value of h.

Answer(a) [2]

**(b)** 



NOT TO **SCALE** 

$$\sin\theta = \frac{2}{3},$$

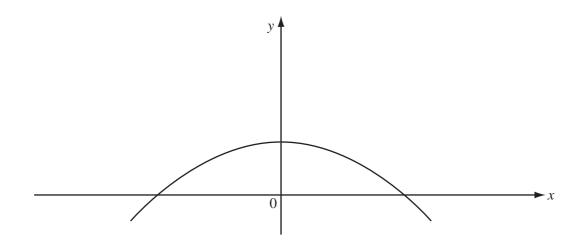
$$\sin \theta = \frac{2}{3}$$
,  $\cos \theta = \frac{\sqrt{5}}{3}$ ,  $\tan \theta = \frac{2}{\sqrt{5}}$ .

$$\tan \theta = \frac{2}{\sqrt{5}}$$
.

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]

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

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

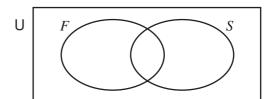
Answer(b)	[2]
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7 Sara records some information about the number of cars in a car park.

U = {cars in the car park}

 $F = \{5\text{-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.



(c) Sara chooses a silver car at random.

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

Answer(c) [1]

Factorise completely

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

*Answer(a)* [2]

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

*Answer(b)* [2]

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

When x = 4, y = 3.

Find y when x = 25.

*Answer* [3]

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The	first fi	ve terms of	a sequence a	re					
			-2,	1,	6,	13,	22.		Exc
(a)	Write	down the n	next term in th	ne sequenc	e.				
					Answer(a	)			[1]
(b)	Find a	an exnressio	on in terms of	fn for the					
(6)	T ma c	ш ехргезы	511, 111 termis or	in, for the	min term or	the seque	ice.		
					Answer(b)	)			[3]
									_
							em.		
Calc	culate l	now much v	water the smal	ller contain	ner can hold	when full			
	(a)  (b)  Two	(a) Write  (b) Find a  Two mather The larger	(a) Write down the restriction (b) Find an expression (c) Two mathematically so The larger container, so	Two mathematically similar contains. The larger container, when full, can	(a) Write down the next term in the sequence  (b) Find an expression, in terms of <i>n</i> , for the  Two mathematically similar containers have I  The larger container, when full, can hold 320	-2, 1, 6,  (a) Write down the next term in the sequence.  Answer(a),  (b) Find an expression, in terms of n, for the nth term of  Answer(b),  Two mathematically similar containers have heights of 3. The larger container, when full, can hold 320 ml of water.	-2, 1, 6, 13,  (a) Write down the next term in the sequence.  Answer(a)	-2, 1, 6, 13, 22.  (a) Write down the next term in the sequence.  Answer(a)	-2, 1, 6, 13, 22.  (a) Write down the next term in the sequence.  Answer(a)

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Question 12 is on the next page.

12	(a)	(i	i) 3	$\mathbf{S}^p =$	81

Write down the value of p.

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

Write down the value of q.

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

Find the value of *y*.

Answer(b) [3]

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