

CANDIDATE NAME

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

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CENTRE NUMBER	CANDIDATE NUMBER		

MATHEMATICS 0581/32

Paper 3 (Core) October/November 2010

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator Geometrical instruments

Mathematical tables (optional) Tracing paper (optional)

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.

You may use a pencil for any diagrams or graphs.

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

DO **NOT** WRITE IN ANY BARCODES.

Answer all questions.

If working is needed for any question it must be shown below that question.

Electronic calculators should be used.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.

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

The total of the marks for this paper is 104.

•	For
1	iner's
OA.	
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. 4	

A d	rink consists of water and fruit juice.	di
(a)	24% of the drink is water.	1
	Show that there is a total of 760 cm ³ of fruit juice in one litre of the drink.	
	Answer(a)	
		[2]
(b)	What fraction of one litre of the drink is fruit juice?	
	Give your answer in its simplest form.	
	Answer(b)	[2]
(c)	The 760 cm ³ of fruit juice in one litre of the drink is made from apple, mango and peach in following ratio.	the
	Apple : Mango : Peach = 6 : 15 : 17	
	Calculate the amount of apple juice.	
	Answer(c) cm ³	[2]
(d)	A shopkeeper buys bottles of the drink for 65 cents each. He sells them for 80 cents each.	
	Calculate the percentage profit he makes on each bottle he sells.	
	Answer(d) %	[3]

f and g are both integers greater than 1.

Write down one possible pair of values of f and g.

3

In 1.

The sof
$$f$$
 and g .

Answer(a)(i) f = g and g = g [1]

(ii) Find all the prime factors of 90.

(b) Six number cards are shown below.

0

4

9

5

1

8

One or more of the cards are chosen to make different numbers.

For example

5

9

makes the number 59.

Choosing a card or cards, write down

(i) a 2-digit odd number less than 40,

1 (1-)(;)	Г17
Answer(b)(1)	111
11.00,,0.	 L - J

(ii) the largest 3-digit even number,

$$Answer(b)(ii)$$
 [1]

(iii) a 2-digit square number greater than 50,

(iv) a cube number,

$$Answer(b)(iv) \qquad [1]$$

(v) a 2-digit multiple of 13,

$$Answer(b)(v)$$
 [1]

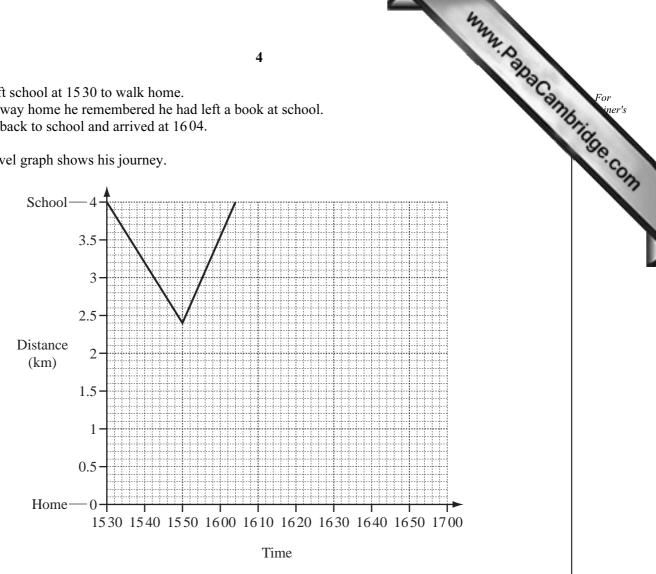
(vi) the cube root of 64,

$$Answer(b)(vi) \qquad [1]$$

(vii) a prime number between 100 and 120.

He ran back to school and arrived at 1604.

The travel graph shows his journey.



- (a) Use the graph to answer the following questions.
 - (i) At what time did Kim start to run back to school?

(ii) How far was he from school at this time?

(iii) How many minutes did he take to run back to school?

(iv) What was his speed, in kilometres per hour, on his journey back to school?

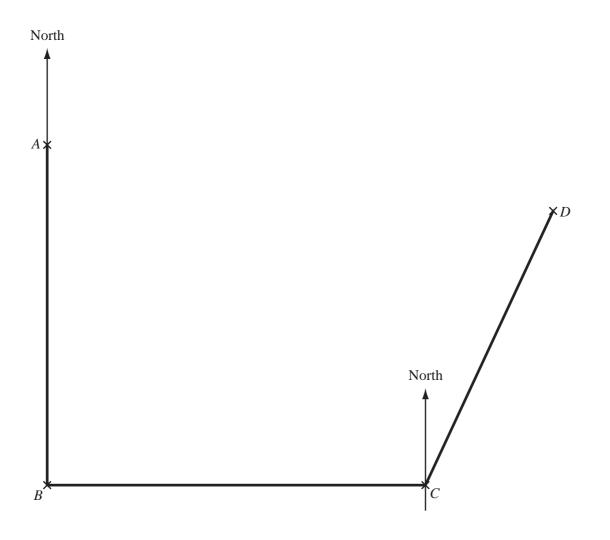
(b)	Kim spent 6 minutes at school collecting his book. He then walked home at a speed of 6 km/h.	For iner's
	(i) Complete the travel graph.	[3] 70%
	(ii) At what time did Kim arrive home?	.col
	Answer(b)(ii)	[1]
(c)	Kim's sister, Julie, left the school at 15 48. She walked at a steady speed, without stopping, and arrived home 46 minutes later.	
	(i) On the grid, draw the travel graph of Julie's journey home from school.	[2]
	(ii) Complete the sentence.	
	arrived home first by minutes.	[1]

	6			
4	An accurate scale drawing of three sides of a garden, AB, BC, and CD is shown on the opposite A is due north of B and C is due east of B.	aCanni		
	(a) A vegetable area is to be constructed in the garden.			
	Parts (i) and (iii) must be completed using a straight edge and compasses only.			
	On the scale drawing			
	(i) construct the perpendicular bisector of BC ,	[2]		
	(ii) mark the point S at the midpoint of BC ,	[1]		
	(iii) construct the bisector of angle ABC,	[2]		
	(iv) mark the point R where this line crosses the perpendicular bisector of BC ,	[1]		
	(v) mark the point Q on BA where $BQ = SR$,	[1]		
	(vi) draw the vegetable area, quadrilateral <i>BQRS</i> .	[1]		
	(b) On the scale drawing, 1 centimetre represents 6 metres.			
	Calculate the vegetable area in square metres.			
	Answer(b) m^2	[3]		
	(c) A tree, T , is on a bearing of 070° from A and 345° from C .			
	On the scale drawing, mark the position of <i>T</i> .	[2]		

(d) Draw accurately the locus of points which are 24 metres from the tree, T.

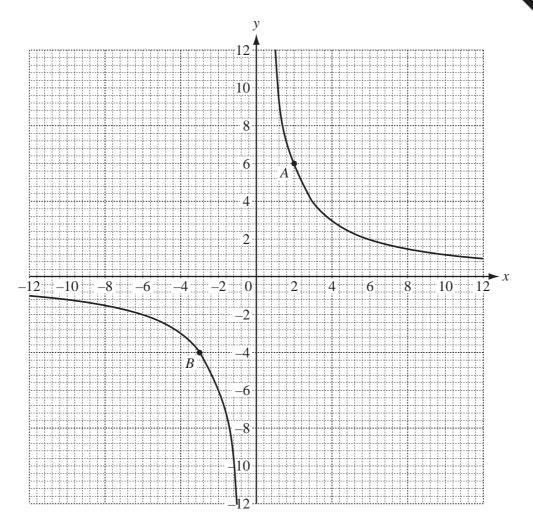
[2]

[2]



Scale: 1 cm = 6 m





A graph is drawn on the grid. Points *A* and *B* are marked on the curves.

(a) (i) Write down the co-ordinates of the points A and B.

(ii) The equation of the graph is xy = n.

Write down the value of n.

Answer(a)(ii) n = [1]

	The state of the s	
	Write down the order of rotational symmetry of the graph. Answer(b)(i)	
(b) (i)	Write down the order of rotational symmetry of the graph.	For
	Answer(b)(i)	bride
(ii)	On the grid, draw the lines of symmetry of the graph. [2]	ai
(iii)	Write down the equation of each line of symmetry.	
	Answer(b)(iii) and [2]	
(c) (i)	One line of symmetry crosses both curves.	
	Write down the <i>x</i> co-ordinates of the points where this line meets each curve. Give your answers to 1 decimal place.	
	$Answer(c)(i) x = \qquad \text{and } x = \qquad [2]$	
(ii)	On the grid, draw the line which passes through the point (0, 4) and is parallel to the line of symmetry in part (c)(i) .	
(iii)	Write down the equation of this line in the form $y = mx + c$.	
	Answer(c)(iii) y = [2]	
		1

6	(a)	The formula for finding the interior angle of a regular polygon with n sides is given below	-dy
		Interior angle = $\frac{180(n-2)}{}$	1

Ortice News

(i) Find the size of the interior angle of a regular polygon with 9 sides.

Answer(a)(i)	 [2]
(1)()	L .

(ii) Multiply out the brackets.

$$180(n-2)$$

(iii) A regular polygon has an interior angle of 156°.

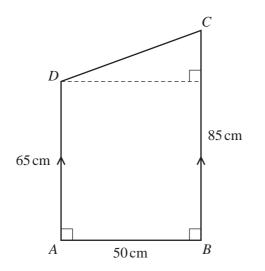
How many sides does this polygon have?

(b) Solve the simultaneous equations.

$$3x + 5y = 9$$
$$x + 2y = 4$$

$$Answer(b) x =$$

$$y =$$
 [3]



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The diagram represents the cross-section of a storage box. AB = 50 cm, AD = 65 cm and BC = 85 cm. AD is parallel to BC.

(a) Write down the geometrical name of the quadrilateral ABCD.

4 ()	F 1 7
Answer(a)	111
111151101	 L * J

(b) Calculate angle *DCB*.

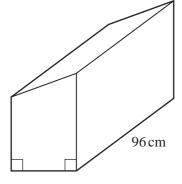
Answer(b) Angle
$$DCB =$$
 [3]

(c) Calculate the area of the cross-section ABCD.

Answer(c) cm^2 [2]

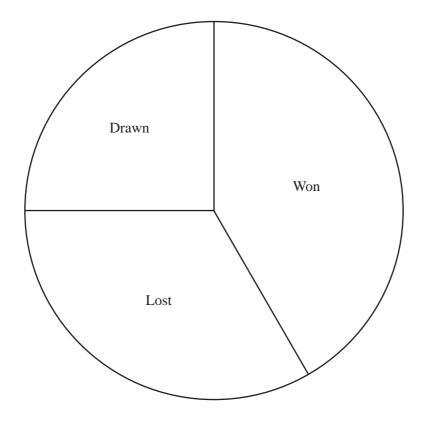
(d) The storage box is 96 cm long.

Calculate the volume of the box. Write down the units of your answer.



Answer(d) [2]

8 (a) The results of 24 games of hockey played by a school team in one year are shown in chart below.



(i)	Show that the	school team	won 10	games	during	the year.
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Answer(a)(i)

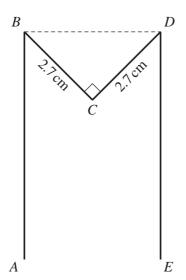
[2]

(ii) Find how many games were lost and how many games were drawn.

Answer(a)(ii) Lost

Drawn [3]

The numbe	er of goals sc	ored by the	hockey tear	n in each of	the 24 gan	nes are shov	vn below	SCS.
0	er of goals sc 2 0	1	1	0	3	2	5	13
3	0	2	3	2	1	4	0	
2	1	2	1	0	1	4	1	
(i) Comp	lete the frequ	uency table	below. You	may use the	tally colu	mn to help y	you.	
Number o	umber of goals per game		Tally			Number of games		
	0							
	1							
	2							
	3							
	4							
	5							
	down the mo	ode.	Ans	wer(b)(ii)				[1]
(iv) Calcul	late the mean	n number of		<i>wer(b)</i> (iii) ame.				[2]
			Ans	wer(b)(iv)				[3]



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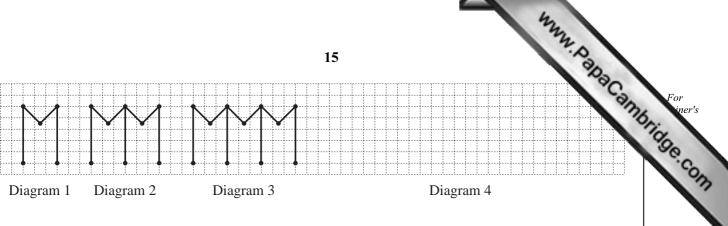
- (a) In the diagram above, AB and ED are vertical. The diagram is symmetrical about a line through C parallel to AB. Angle $BCD = 90^{\circ}$ and BC = CD = 2.7 cm.
 - (i) Calculate BD.

(ii) Complete the statement.

Triangle *BCD* is right-angled and [1]

(iii) Find the size of angle ABC.

$$Answer(a)$$
(iii) Angle $ABC =$ [1]



(b) The pattern of diagrams above is continued by adding more lines and dots.

(i) On the grid, draw diagram 4.

[1]

(ii) Complete the table below.

Diagram	1	2	3	4	5
Number of lines	4	7			

[2]

- (c) How many lines will there be in
 - (i) Diagram 9,

(ii) Diagram *n*?

Answer(c)(ii) [2]

(d) The number of lines in Diagram r is 76.

Find the value of r.

$$Answer(d) r =$$
 [2]

(e) Write down an expression, in terms of n, for the number of **dots** in Diagram n.

Answer(e)

[1]

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