

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

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CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

MATHEMATICS 0581/33

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.

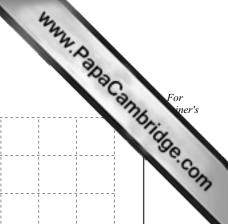
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

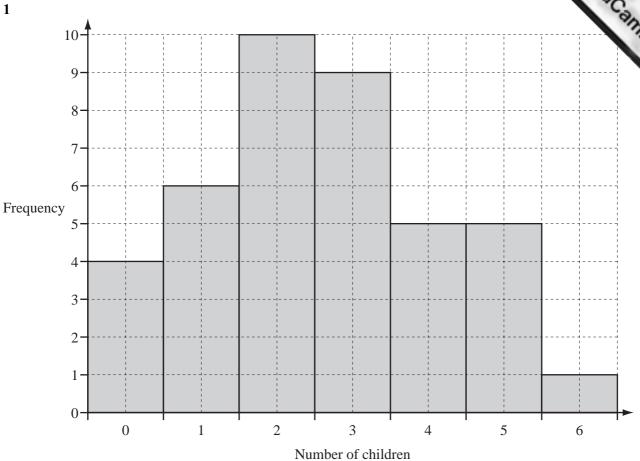
For π , use either your calculator value or 3.142.

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.





The number of children in each of 40 families was recorded. The bar chart shows the results.

(a) Complete the frequency table.

Number of children	0	1	2	3	4	5	6
Frequency	4	6					

[3]

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(i) the mode,

Answer(b)(i) [1]

(ii) the median,

Answer(b)(ii) [2]

(iii) the mean.

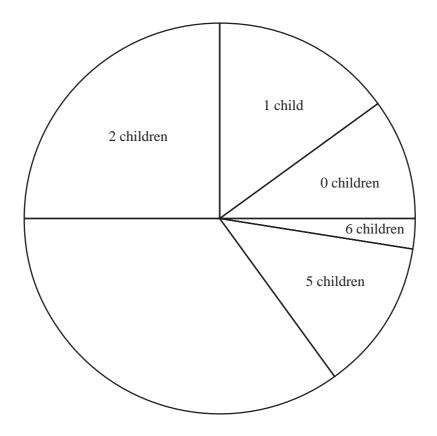
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Answer(b)(iii) [3]

- (c) A pie chart showing the information has been started.
 - (i) Calculate the angles of the sectors for 3 and 4 children.

Answer(c)(i) , [3]

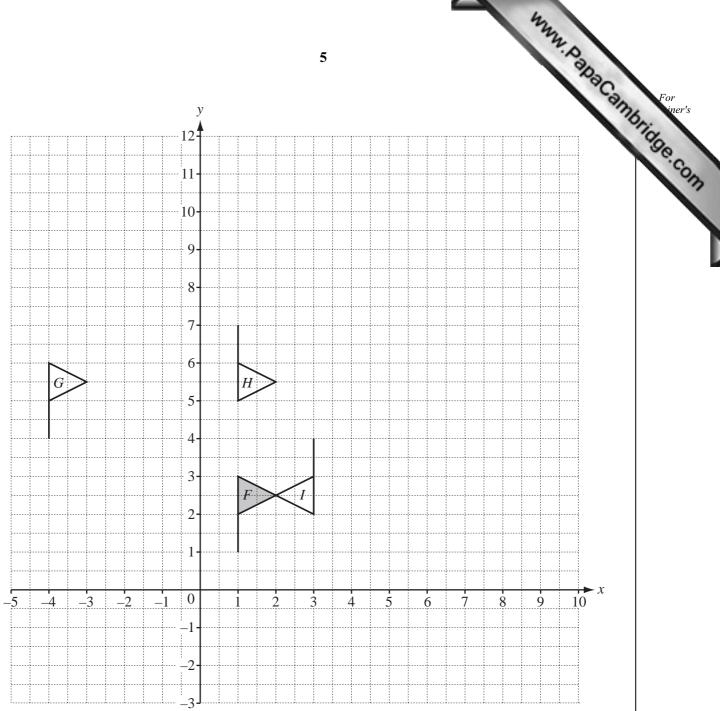
(ii) Complete the pie chart accurately.



[1]

		The state of the s	
		4	
Edu	ıardo	lives in Argentina and travels to Uruguay for a holiday.	OC OV
(a)		lives in Argentina and travels to Uruguay for a holiday. flight from Buenos Aires to Montevideo takes 55 minutes. plane departs at 1735. Write down the arrival time.	13
	(i)	Write down the arrival time.	
		Answer(a)(i)	[1]
	(ii)	The distance between Buenos Aires and Montevideo is 230 km.	
		Calculate the average speed of the plane.	
		Answer(a)(ii) km/h	[3]
(b)		he airport, Eduardo changed some Argentine pesos (ARS). received 9121 Uruguay pesos (UYU).	
	(i)	The exchange rate was ARS $1 = UYU 6.515$.	
		Calculate how many Argentine pesos Eduardo changed.	
		Answer(b)(i) ARS	[2]
	(ii)	Eduardo spent 1890 Uruguay pesos on meals.	
		Calculate this as a percentage of the UYU 9121.	
		Answer(b)(ii)%	[1]
	(iii)	At the end of his holiday, Eduardo has UYU 610 remaining. He changes this into Argentine pesos when the exchange rate is UYU 1 = ARS 0.149.	
		Calculate how much Eduardo receives in Argentine pesos. Give your answer to the nearest whole number.	
		Anguay (A) (;;;) ADS	[2]
		Answer(b)(iii) ARS	[2]

[2]



- (a) Describe fully the **single** transformation that maps
 - (i) flag F onto flag G,

The state of the s	
Answer(a)(i)	[2]
Answerianti	121

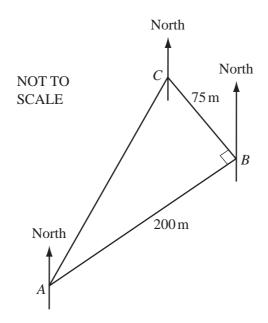
(ii) flag F onto flag H,

4 ()(::)	$\Gamma \cap T$	
Answerianiii	171	
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(iii) flag F onto flag I.

Answer(a)(iii)	[3]	
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- **(b)** On the grid, draw
 - (i) the reflection of flag F in the y-axis, [2]
 - (ii) the enlargement of flag F, centre (0, 0) and scale factor 4.



Dariella walks 200 m from A to B. She then turns through 90° and walks 75 m from B to C.

- (a) Calculate
 - (i) the distance AC,

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(ii) angle CAB.

$$Answer(a)$$
(ii) Angle $CAB =$ [2]

(b) The bearing of *B* from *A* is 065° .

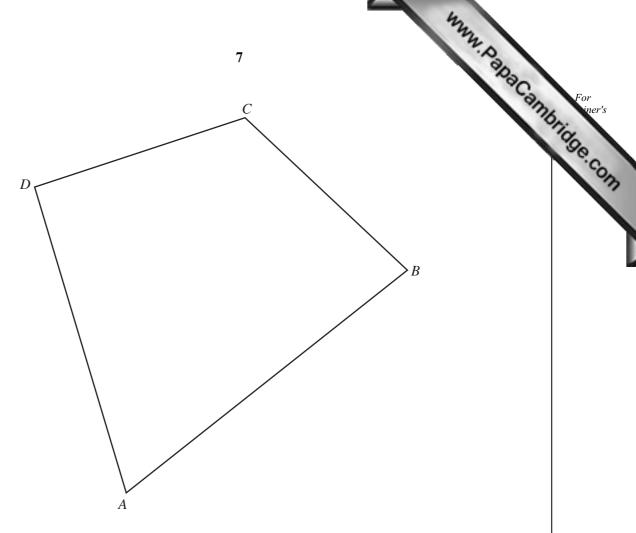
Find the bearing of

(i) C from A,

(ii) A from C,

(iii) C from B.

$$Answer(b)(iii)$$
 [2]



The diagram shows a quadrilateral ABCD.

(a) Using a straight edge and compasses only, construct

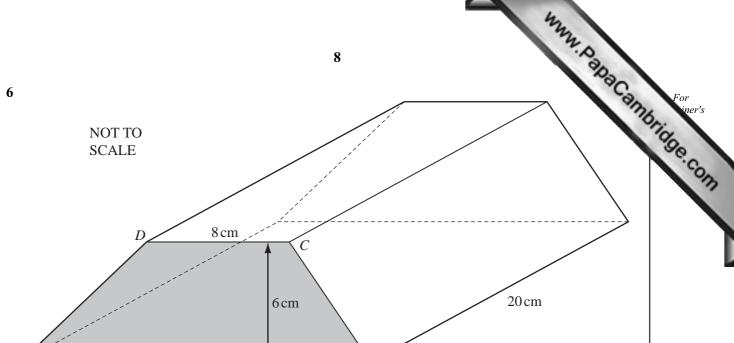
- (i) the perpendicular bisector of AB, [2]
- [2] (ii) the bisector of angle ADC.
- **(b)** Draw accurately the locus of points, inside the quadrilateral, that are 2 cm from BC. [2]
- (c) Shade the region, inside the quadrilateral, which is

nearer to B than to A

and nearer to DC than to DA

and more than 2 cm from BC.

[1]



В

The diagram shows a prism of length 20 cm.

12 cm

The cross-section of the prism is a trapezium, ABCD, with AB parallel to DC. $AB = 12 \,\mathrm{cm}$, $DC = 8 \,\mathrm{cm}$ and the perpendicular distance between AB and DC is $6 \,\mathrm{cm}$.

- (a) Calculate
 - (i) the area of the trapezium ABCD,

Answer(a)(i)	 cm^2	[2]

(ii) the volume of the prism.

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- **(b)** The prism is solid and made of brass.
 - (i) One cubic centimetre of brass has a mass of 8.5 grams.

Calculate the mass of the prism. Give your answer in kilograms.

Answer(h)(i)	kg	[2]

(ii) Brass costs \$2.26 for one kilogram.

How much will the brass cost to make this prism? Give your answer correct to 2 decimal places.

<i>Answer(b)</i> (11) \$		L2	[۲	
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	10 WMM. D	
He bu	has d dollars to spend. The spend of the sp	aCana
()		
(b) T	Answer(a) \$	[2]
I	Find the value of d.	
(c) I	Answer(b) d = How much does Alex have left after buying the book?	[2]
	Answer(c) \$	[1]

For iner's

$$A = \frac{\pi r^2}{5}$$

(a) Calculate the area when the radius is 7.5 cm.

Answer(a)
$$cm^2$$
 [2]

(b) Make r the subject of the formula.

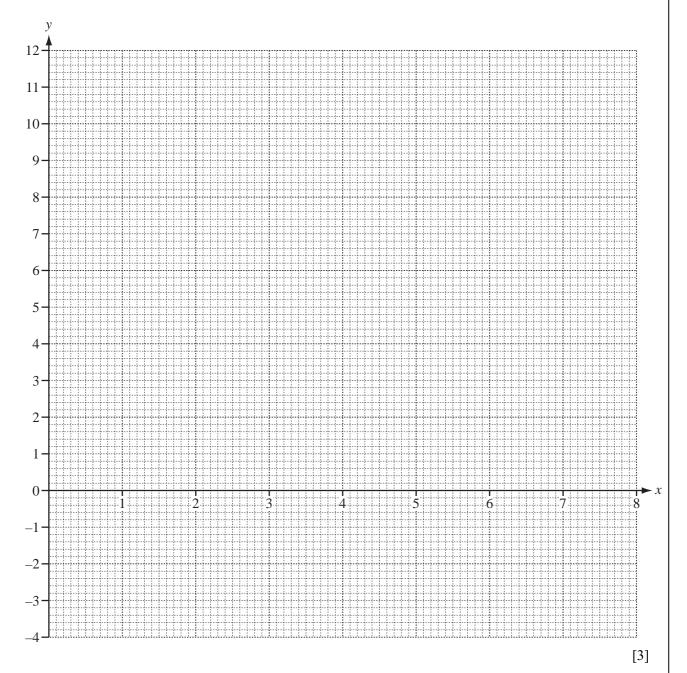
$$Answer(b) r = [3]$$

(c) Calculate r when $A = 4.8 \,\mathrm{cm}^2$.

(a) (i) Complete the table for $y = 12 - x^2$.

x	0	1	2	3	4
y	12	11			-4

(ii) On the grid, draw the graph of $y = 12 - x^2$ for $0 \le x \le 4$.



(iii) Use your graph to solve the equation $12 - x^2 = 0$.

Answer (a)(iii) x =[1]

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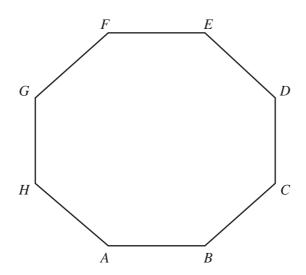
(b) (i) Complete the table for $y = \frac{12}{x}$, $x \neq 0$.

				13					m	For iner's
C	omplete the table f	for $y =$	$\frac{12}{x}$, $x \neq$	6 € 0 .						For iner's
	х	1	2	3	4	5	6	7	8	36.CO
	у	12	6	4		2.4		1.7		

[3]

(ii) On the grid opposite, draw the graph of
$$y = \frac{12}{x}$$
 for $1 \le x \le 8$. [3]

(c) Write down the co-ordinates of the points of intersection of the two graphs.



NOT TO SCALE

ABCDEFGH is a regular octagon.

(a) Show that angle $BCD = 135^{\circ}$.

Answer (a)

[2]

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- (b) Find
 - (i) angle *DEB*,

$$Answer(b)(i) Angle DEB = [1]$$

(ii) angle FEB.

$$Answer(b)(ii) Angle FEB = [1]$$

(c) R QGDН CS

NOT TO SCALE

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The sides of the octagon are extended to form the square *PQRS*. The length of each side of the octagon is 12 cm and the length of *BP* is 8.485 cm.

Calculate the area of

(i) triangle BPC,

 cm^2	[2]
	cm ²

(ii) the octagon ABCDEFGH.

	2	
Answer(c)(ii)	 cm ²	[3]

0, 1, 1, 2, 3, 5, 8, ...

This sequence has the rule:

After the first two terms, any term is the sum of the two previous terms.

The first two terms are 0 and 1, the 3rd term is 0 + 1 = 1, the 4th term is 1 + 1 = 2,

the 5th term is 1 + 2 = 3 and so on.

Show that the 8th term is 13.

Answer(a)(i) [1]

(ii) Each of the following sequences have the same rule as part (a)(i).

For each sequence write down the missing terms.

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(b) For the following sequences find the next term and the n th term.

(i) 1, 3, 5, 7, 9,
$$n \text{ th term} =$$
 [3]

(ii) 1, 4, 9, 16, 25,
$$n \text{ th term} =$$
 [2]

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