

CANDIDATE NAME

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

Original Constitution

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CENTRE NUMBER			CANDIDATE NUMBER		

MATHEMATICS 0581/12

Paper 1 (Core) October/November 2010

1 hour

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  $\pi$ , use either your calculator value or 3.142.

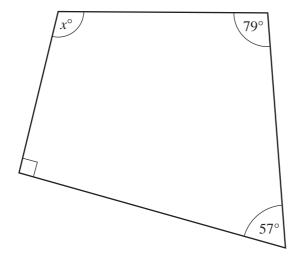
At the end of the examination, fasten all your work securely together.

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 56.



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The diagram shows a quadrilateral. Work out the value of *x*.

Answer x =	 [1]

2 Caroline changed £200 into New Zealand dollars (NZ\$). The exchange rate was £1 = NZ\$2.56.

How many New Zealand dollars did she receive?

Answer NZ\$ [1]

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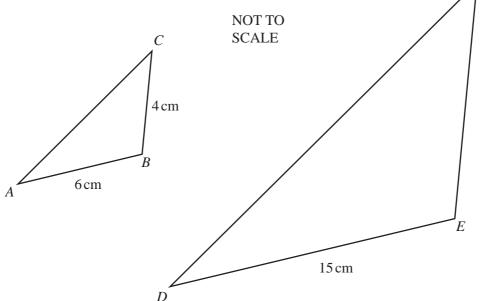
[2]

3	Francis recorded a temperature of -4°C on Sunday.
	By Monday it had gone down by 3°C.

	(a)	Find the temperature on Monday.					•
		4	Answer(a	a)		°C	[1]
	(b)	On Tuesday the temperature was $-1$ °C.					
		Find the change in temperature between M	onday an	nd T	uesday.		
		2	Answer(b	<i>b)</i>		°C	[1]
4	The	e distance from the Sun to the planet Saturn i	s 14294	400	000 kilometres.		
	Wri	ite this distance in standard form, correct to 3	3 signific	ant	figures.		
		1	Answer			km	[2]
5	A fa	actory makes doors that are each 900 millime	etres wid	le, c	orrect to the nearest millimetre.		
	Con	mplete the statement about the width, w milli	metres, c	of e	ach door.		

Answer

For iner's



The triangles ABC and DEF are similar. AB = 6 cm, BC = 4 cm and DE = 15 cm.

Calculate EF.

Answer 
$$EF =$$
 cm [2]

7 Maria puts \$600 into a bank account for 3 years at a rate of 3.4% per year **compound** interest.

Calculate how much will be in the account at the end of the 3 years.

Answer \$ [3]

$$8pq + 12pr$$

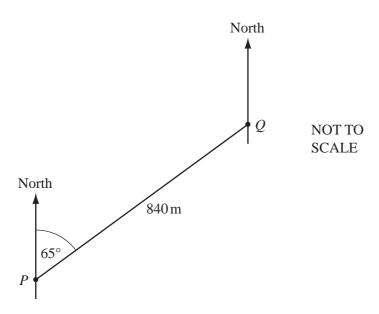
Answer(a) [2]

(b) Use your answer to part (a) to make p the subject of the formula below.

$$s = 8pq + 12pr$$

$$Answer(b) p = [1]$$

9



The diagram shows a straight road PQ. PQ = 840m and the bearing of Q from P is  $065^{\circ}$ .

(a) Work out the bearing of P from Q.

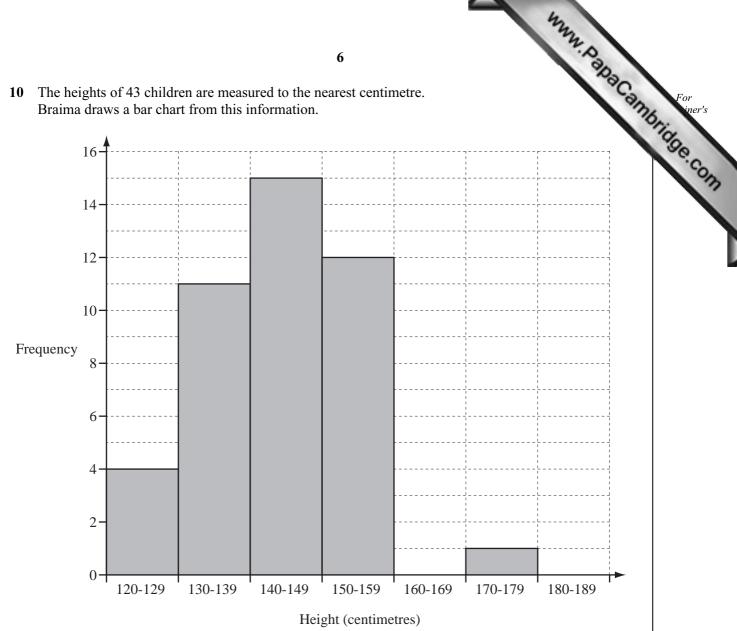
Answer(a)		- 111

**(b)** Calvin walks  $\frac{4}{7}$  of the distance from *P* to *Q*.

How far is he from Q?

Answer(b)	m	[2]
- ( - /		

The heights of 43 children are measured to the nearest centimetre. Braima draws a bar chart from this information.



A child is chosen at random. Write down, as a fraction, the probability that the child will be

(a) in the group  $140 - 149 \,\mathrm{cm}$ ,

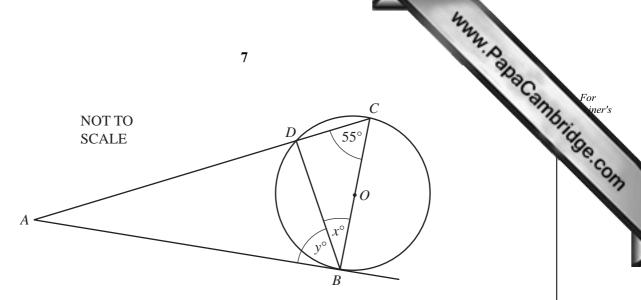
Answer(a) [1]

(b) less than 160 cm,

Answer(b) [1]

(c) in the group 160 - 169 cm.

Answer(c) [1]



The diagram shows a circle, centre O, with diameter BC. AB is a tangent to the circle at B and angle  $BCD = 55^{\circ}$ . A straight line from A meets the circle at D and C.

Calculate the value of

(a) x,

$$Answer(a) x =$$
 [2]

**(b)** *y*.

$$Answer(b) y =$$
 [1]

12 (a) Write down the value of x when

(i) 
$$5^x \div 5^2 = 5^4$$
,

$$Answer(a)(i) x =$$
 [1]

(ii) 
$$\frac{1}{49} = 7^x$$
.

$$Answer(a)(ii) x =$$
 [1]

**(b)** Write down the value of  $3p^0$ .

$$Answer(b)$$
 [1]

- 13 Dominic, Esther, Flora and Galena shared a pizza.
  - (a) Dominic ate  $\frac{1}{5}$  of the pizza and Esther ate  $\frac{2}{7}$  of the pizza.

Show that  $\frac{18}{35}$  of the pizza remained.

Do not use your calculator and show all your working.

Answer (a)

[2]

(b) Flora ate  $\frac{2}{3}$  of the pizza that remained.

Find the fraction of the pizza that was left for Galena.

Answer(b) [2]

14

$$\frac{9.6 \times 7.8 - 0.53 \times 86}{4.95}$$

(a) (i) Rewrite this calculation with each number written correct to 1 significant figure.

Answer(a)(i)

[1]

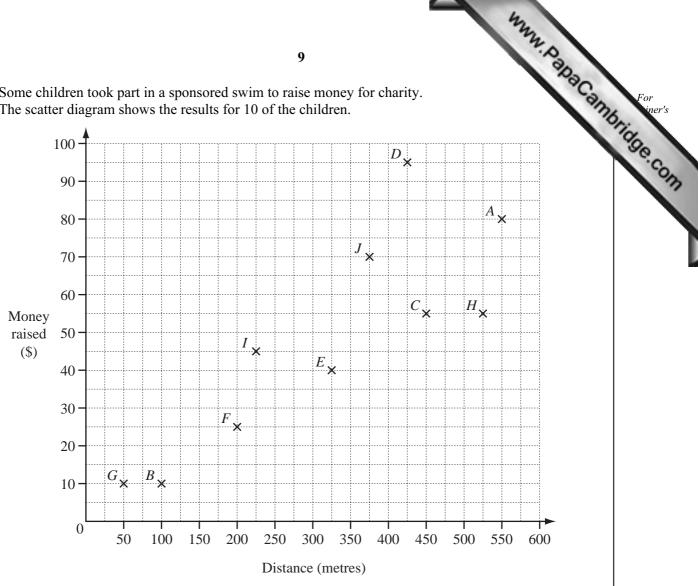
(ii) Work out the answer to your calculation in **part(a)(i)**. Do not use a calculator and show all your working.

 $Answer(a)(ii) \qquad [2]$ 

**(b)** Use your calculator to work out the correct answer to the original calculation.

 $Answer(b) \qquad [1]$ 

15 Some children took part in a sponsored swim to raise money for charity. The scatter diagram shows the results for 10 of the children.



(a) (i) How much further did A swim than J?

(ii) How much more money did D raise than F?

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

**(b)** The results for 2 more children are given in the table below.

Child	Distance (m)	Money raised (\$)
K	125	35
L	475	80

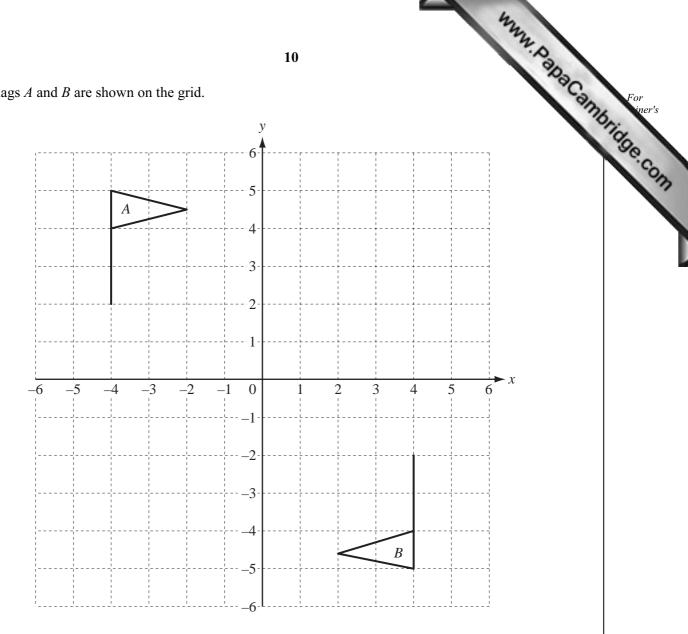
Plot the results for *K* and *L* on the scatter diagram.

[1]

(c) What type of correlation does the scatter diagram show?

4 ( )	E4-
Answer(c)	- 11
This wer (c)	 L*.

**16** Flags *A* and *B* are shown on the grid.



(a) Describe fully the **single** transformation which maps flag A onto flag B.

**(b)** On the grid, draw the translation of flag *A* by the vector  $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$ . [2]

$$\overrightarrow{AB} = \begin{pmatrix} 3 \\ -3 \end{pmatrix}$$

$$\overrightarrow{AC} = \begin{pmatrix} -5 \\ 0 \end{pmatrix}$$

(a) Calculate  $\overrightarrow{AB} + 3\overrightarrow{AC}$ .

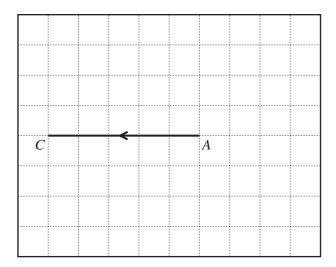
$$Answer(a) \qquad \qquad \boxed{2}$$

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**(b)** Write down  $\overrightarrow{BA}$ .

$$Answer(b) \overrightarrow{BA} = \left( \begin{array}{c} \\ \end{array} \right)$$
 [1]

(c)  $\overrightarrow{AC}$  is drawn on the grid below.



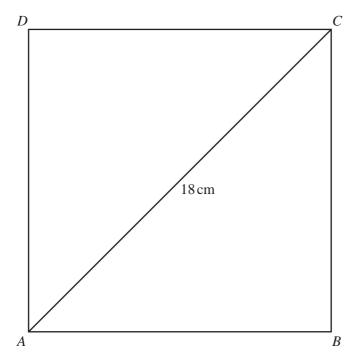
(i) On the grid, draw  $\overrightarrow{AB}$ .

[1]

(ii) Write down the obtuse angle between  $\overrightarrow{AB}$  and  $\overrightarrow{AC}$ .

*Answer(c)*(ii) [1]

Question 18 is printed on the next page.



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The diagram shows a square *ABCD*. The length of the diagonal *AC* is 18 cm.

- (a) Calculate
  - (i) the length of the side of the square,

Answer(a)(i)	cm	[2]

(ii) the area of the square.

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

**(b)** A, B, C and D lie on a circle with diameter AC.

Calculate the area of this circle.

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

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