



1 (a)

3 5 8 10 10

For the numbers above, find

(i) the mean,

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

(ii) the mode,

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

(iii) the median,

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

(iv) the range.

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

(v) A sixth number, **11**, is added to the list.

Write down which **one** of the mean, the mode, the median and the range will stay the same.

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

(b) The table shows the results of asking 24 children their favourite colour.

Colour	Red	Blue	Yellow	Green	Pink
Number of children	4	8	2	3	7

Write down the probability, as a fraction, that the favourite colour of a child chosen at random is

(i) blue,

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

(ii) **not** pink.

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

(c) The information in **part (b)** is to be shown in a pie chart.

Work out the sector angle for green.

Do not draw the pie chart.

Answer(c) ..... [2]

2 Three children have some marbles.  
Shireen has  $m$  marbles.  
Nazaneen has three times as many marbles as Shireen.  
Karly has 4 more marbles than Shireen.

(a) Write down an expression, in terms of  $m$ , for

(i) the number of marbles Nazaneen has,

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

(ii) the number of marbles Karly has.

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

(b) The three children have a total of 84 marbles between them.

(i) Write down an equation in  $m$ .

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

(ii) Solve your equation.

Answer(b)(ii)  $m =$  ..... [2]

(c) Shireen weighs the 84 identical marbles.  
Their total weight is 4.2 kg.

Calculate, in grams, the weight of one marble.

Answer(c) ..... g [2]

(d) The children now decide to share the 84 marbles in the ratio

$$\text{Shireen} : \text{Nazaneen} : \text{Karly} = 2 : 7 : 3 .$$

Calculate the number of marbles each receives.

Answer(d) Shireen .....

Nazaneen .....

Karly ..... [3]

3 (a) A shop has maps arranged in bookcases.

- (i) The length of one wall in the shop is 7.35 m.  
Each bookcase is 120 cm wide.

Work out the maximum number of bookcases that will fit along this wall.

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

- (ii) Each bookcase weighs 45 kg correct to the nearest 5 kg.

Write down the upper bound for the weight of a bookcase.

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

(b) During July and August the shop sells a total of 160 maps.  
Some of these maps are driving maps and the rest are walking maps.

- (i) Complete the table below.

	Driving maps	Walking maps	Total
July		15	
August	65		
Total		40	160

[2]

- (ii) Write down the fraction of the total number of **walking** maps that are sold in July.  
Give your answer in its simplest form.

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

- (c) The shopkeeper buys each map for \$5.50 .  
He sells each map for \$6.60 .
- (i) Calculate his percentage profit.

*Answer(c)(i)* ..... % [3]

- (ii) Each map has a price in dollars (\$) and euros (€).  
The price is \$6.60 or €3.52 .

Work out the exchange rate for €1 .

*Answer(c)(ii)* €1 = \$ ..... [2]

- (d) The shop is open for 312 days each year.  
The shopkeeper pays 3 employees \$47.66 each per day.

The total annual wage bill for the three employees is given by

$$3 \times 312 \times 47.66 .$$

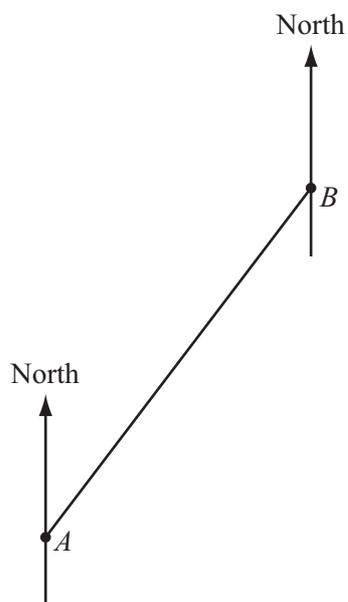
- (i) Rewrite this calculation so that **each** number is rounded to 1 significant figure.

$$3 \times \dots \times \dots \quad [1]$$

- (ii) Use your answer to **part (d)(i)** to work out an estimate for the total annual wage bill.

*Answer(d)(ii)* \$ ..... [1]

- 4 The diagram is part of a map showing the position of two towns Anderro, *A*, and Bratena, *B*. The scale is 1 centimetre represents 10 kilometres.



Scale: 1 cm to 10 km

- (a) Work out the distance, in kilometres, from Anderro to Bratena.

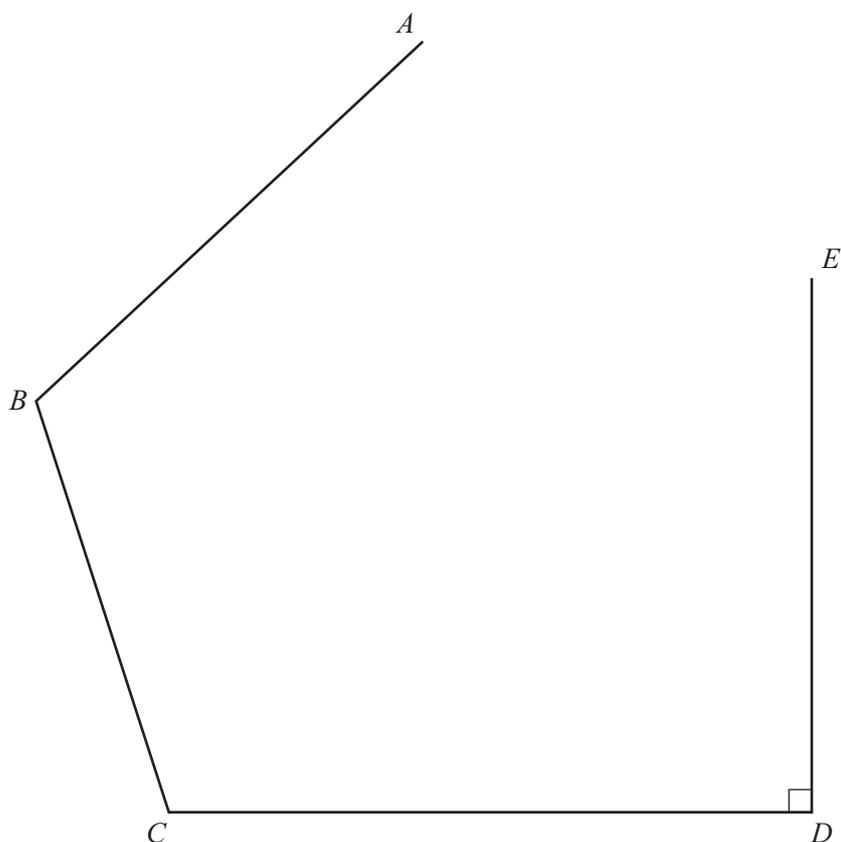
Answer(a) ..... km [2]

- (b) Measure the bearing of Bratena from Anderro.

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

- (c) Carribon is 80 km from Anderro.  
The bearing of Carribon from Anderro is  $304^\circ$ .

Mark the position of Carribon on the diagram. Label it *C*. [2]



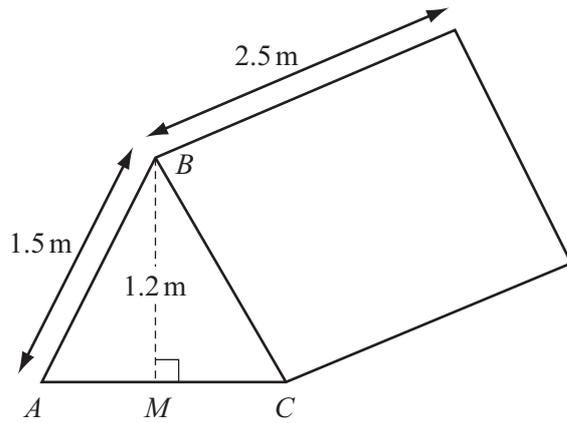
(a) In this part, all constructions must be completed using a straight edge and compasses only. All construction arcs must be clearly shown.

- (i) Construct the perpendicular bisector of  $DE$ . [2]
- (ii) Mark the midpoint of  $DE$  with the letter  $M$ . [1]
- (iii) Construct the bisector of angle  $BCD$ .  
Label the point,  $F$ , where this line crosses the line you have drawn in part (a)(i). [2]
- (iv) Write down the mathematical name of the quadrilateral  $CDMF$ .

Answer(a)(iv) .....

- (b) (i) Draw the locus of points which are 4 cm from  $A$ . [1]
- (ii) Draw the locus of points which are 3 cm from  $E$ . [1]
- (iii) Shade the region which is less than 3 cm from  $E$  and more than 4 cm from  $A$ . [1]

- 6 Finn is going camping.  
The diagram shows his tent.



NOT TO SCALE

$ABC$  is an isosceles triangle.  
 $M$  is the midpoint of  $AC$ .  
 $AB = 1.5$  m and  $BM = 1.2$  m.

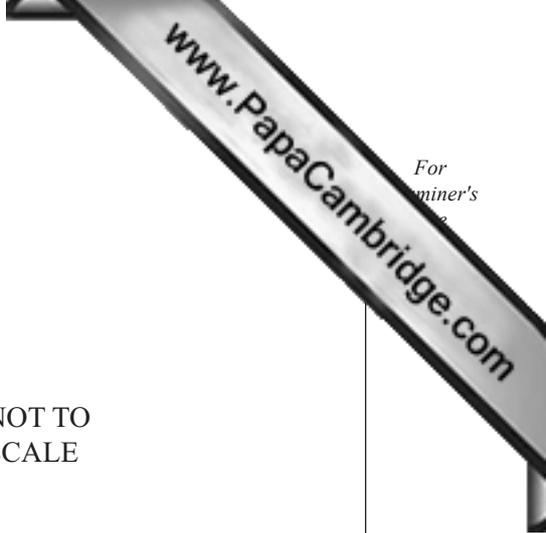
- (a) Show that  $AM = 0.9$  m.

*Answer(a)*

[2]

- (b) Use trigonometry to calculate angle  $ABM$ .

*Answer(b)* Angle  $ABM = \dots\dots\dots$  [2]



- (c) The tent is a prism of length 2.5 m.  
The area of triangle  $ABC$  is  $1.08 \text{ m}^2$ .

Calculate the volume of the tent.  
Give the units of your answer.

*Answer(c)* ..... [2]

- (d) Calculate the surface area of the tent, including the base.

*Answer(d)* .....  $\text{m}^2$  [3]

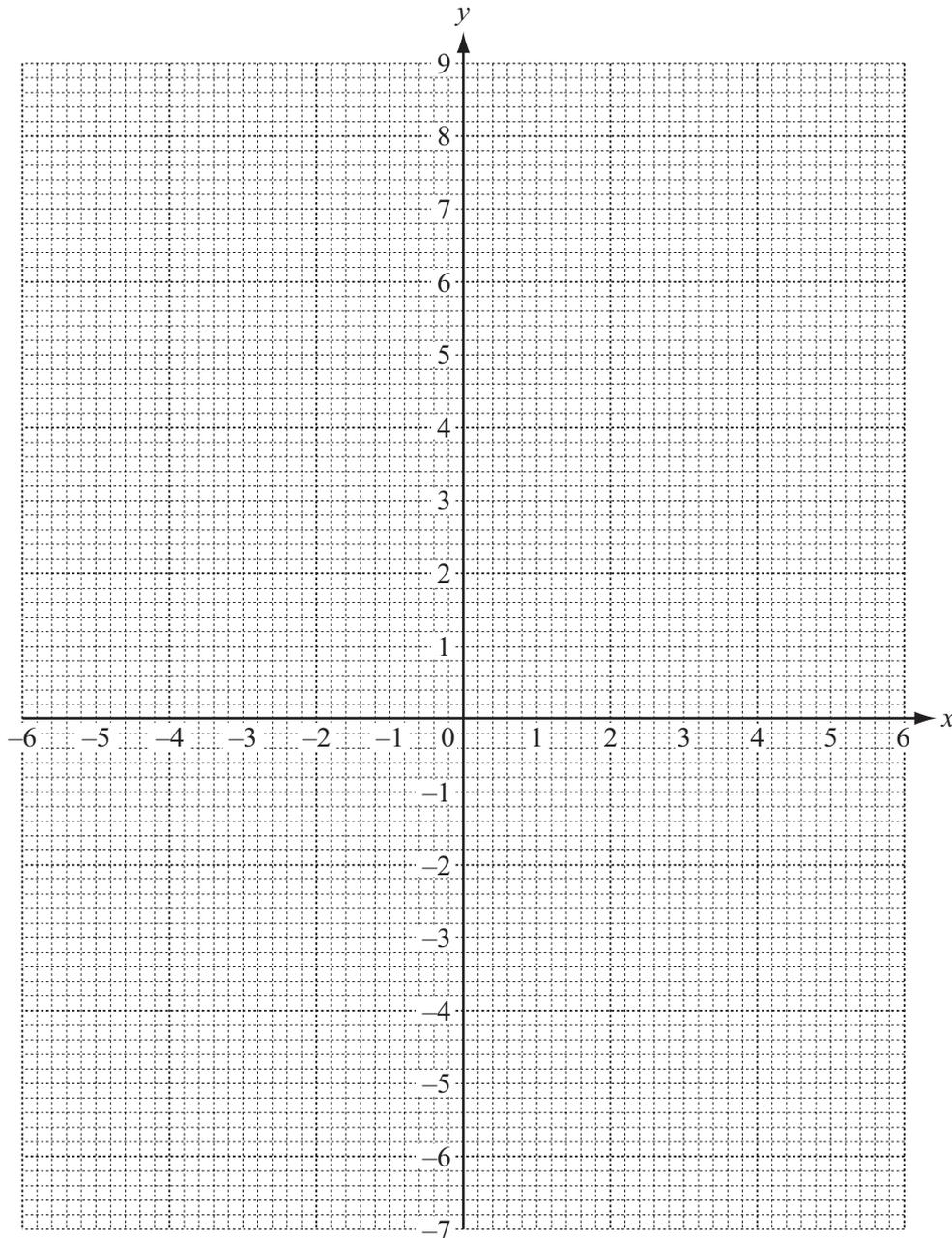
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- 7 (a) Complete the table of values for the function  $y = x^2 - 5x + 2$ .

$x$	-1	0	1	2	3	4	5
$y$			-2	-4	-4		2

[2]

- (b) On the grid, draw the graph of  $y = x^2 - 5x + 2$  for  $-1 \leq x \leq 5$ .



[4]

(c) (i) Write down the co-ordinates of the lowest point of the graph of  $y = x^2 - 5x + 2$ .

Answer(c)(i) (..... , .....)

(ii) On the grid, draw the line  $y = -1$ . [1]

(iii) Write down the  $x$  co-ordinates of the two points where  $y = -1$  crosses the graph of  $y = x^2 - 5x + 2$ .

Answer(c)(iii)  $x = \dots\dots\dots$  and  $x = \dots\dots\dots$  [2]

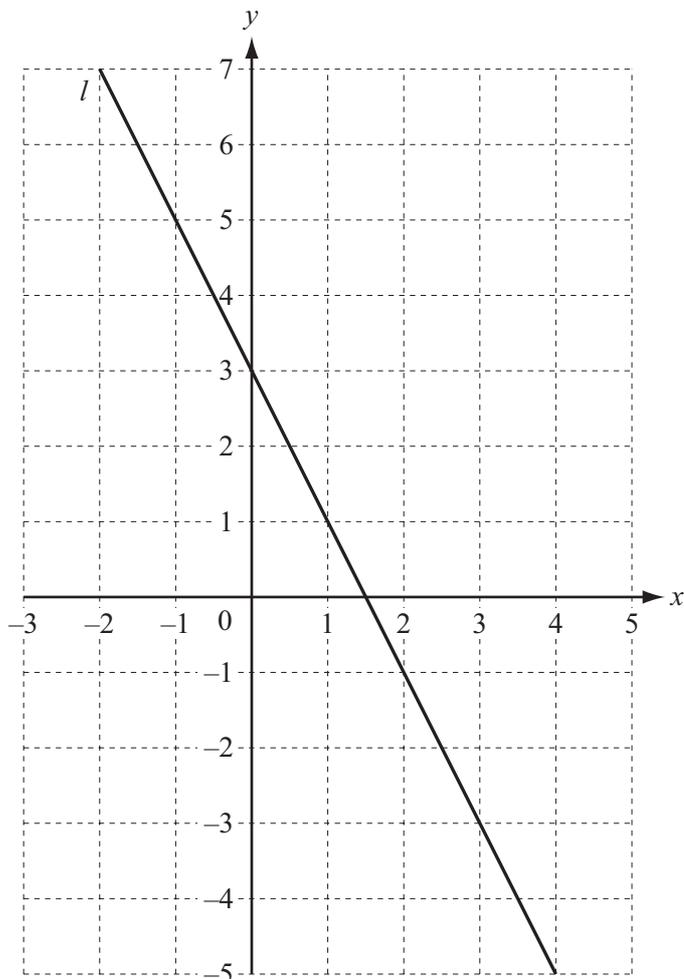
(d) The point (5, 2) is reflected in the  $y$ -axis.

Write down the co-ordinates of the image of the point.

Answer(d) (..... , .....)

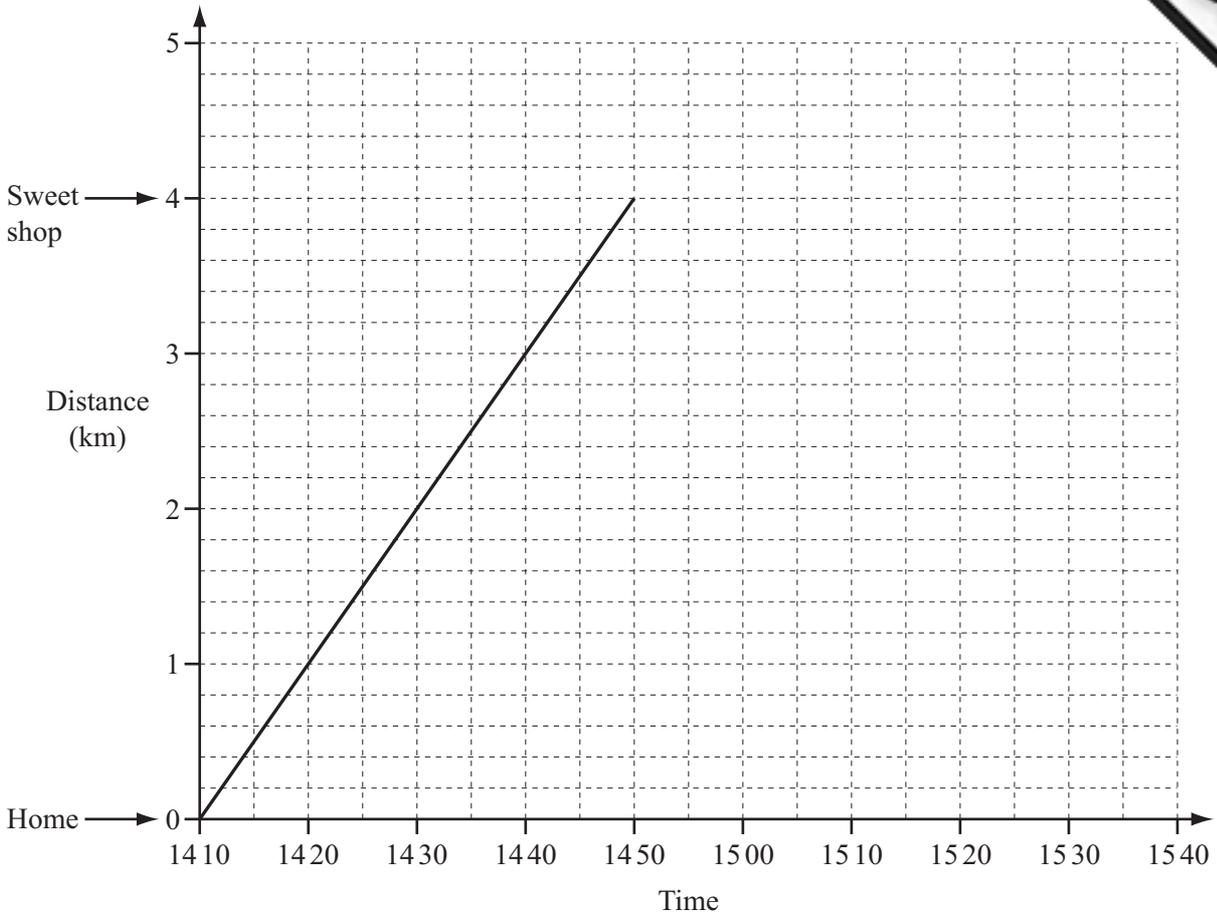
(e) Write down the equation of the line,  $l$ , drawn on the grid below.

Give your answer in the form  $y = mx + c$ .



Answer(e)  $y = \dots\dots\dots$  [3]

8



(a) Jono walked from his home to a sweet shop.

Use the travel graph to calculate his walking speed in kilometres per hour.

Answer(a) ..... km/h [2]

(b) Jono stayed in the sweet shop for 20 minutes.  
He then ran home at a steady speed of 12 km/h.

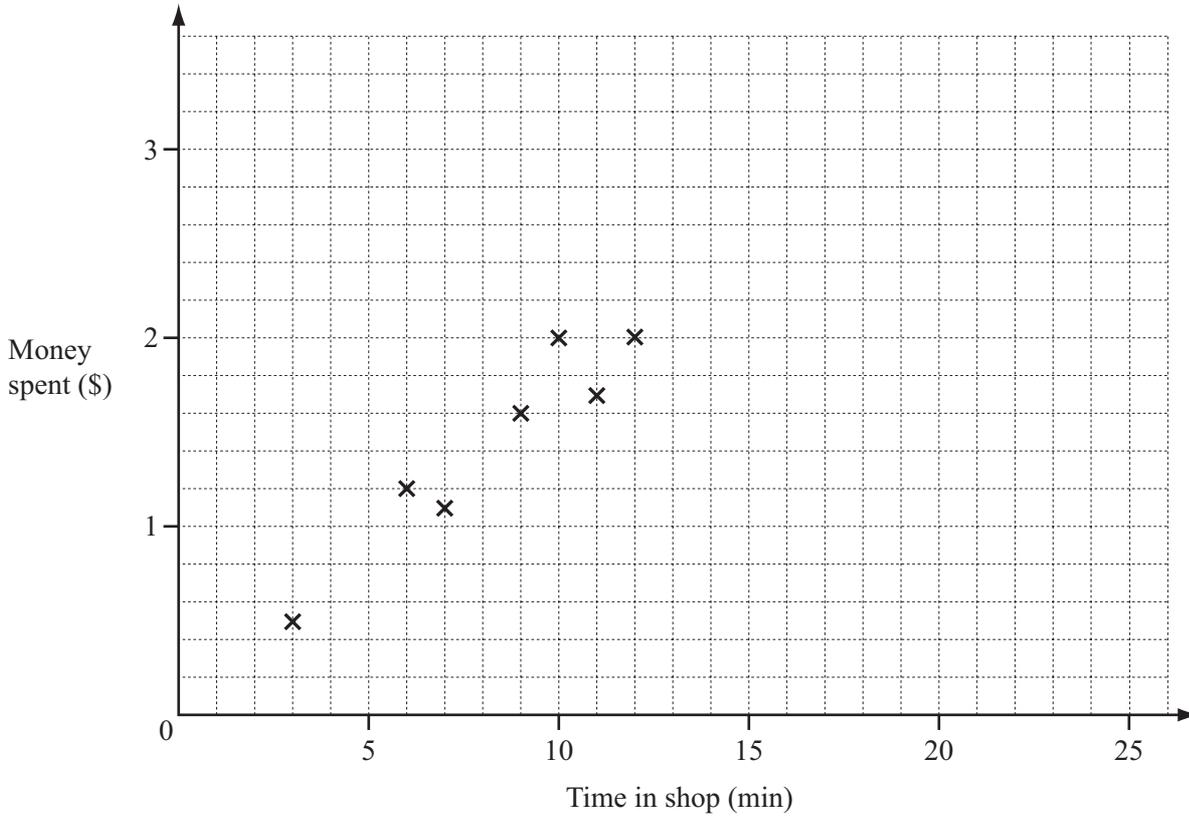
(i) On the grid above, complete the travel graph for Jono. [2]

(ii) Write down the time Jono arrived home.

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

(c) The sweet shop owner records how much time and how much money children spend in his shop.

Time in shop (min)	3	6	7	9	10	11	12	14	15	15	20
Money spent (\$)	0.50	1.20	1.10	1.60	2.00	1.70	2.00	2.80	2.30	2.90	3.00



(i) Complete the scatter diagram.  
The first seven points have been plotted for you. [2]

(ii) What type of correlation does this scatter diagram show?

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

(iii) On the grid, draw the line of best fit. [1]

(iv) A child spent \$2.50 in the shop.  
Use your line of best fit to estimate how long the child was in the shop.

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

- 9 A family of 2 adults and 3 children are on holiday.  
They each hire a mountain bike from the hotel.

Large mountain bike		Small mountain bike	
First hour	Each extra hour	First hour	Each extra hour
\$6	\$2	\$3.60	\$1.20

- (a) The family hire 2 large and 3 small mountain bikes for 5 hours.  
(i) Work out the total cost.

Answer(a)(i) \$ ..... [3]

- (ii) The hotel gives the family a discount of 15% on the total cost.  
Work out how much the family pays.

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

- (b) A wheel of a large bike has a radius of 32 cm.  
(i) Calculate the circumference of a wheel of a large bike.

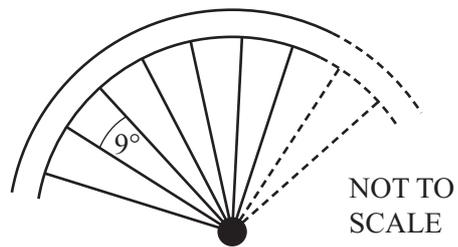
Answer(b)(i) ..... cm [2]

(ii) The family cross a bridge which is 24 m long.

Calculate how many **complete** turns a wheel of a large bike makes to cross the bridge.

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

(c) The diagram shows part of a wheel of a large bike. There is an angle of  $9^\circ$  between two metal spokes. Each spoke is 29 cm long.



Calculate the total length of metal, in metres, needed to make the spokes for one wheel.

Answer(c) ..... m [3]

**Question 10 is printed on the next page.**



10 (a) (i) Find the highest common factor (HCF) of 24 and 36.

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

(ii) Factorise.

$$24x + 36y$$

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

(b) Simplify.

(i)  $w + 8k - 5w + 2k$

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

(ii)  $(x^4)^5$

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

(c) Here are the first four terms of a sequence.

**7      11      15      19**

Find the  $n$ th term of this sequence.

Answer(c) ..... [2]

(d) Solve the simultaneous equations.

$$\begin{aligned} 3x + y &= 8 \\ x + 5y &= 5 \end{aligned}$$

Answer(d)  $x =$  .....

$y =$  ..... [3]

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