

1 A drink consists of water and fruit juice.

(a) 24% of the drink is water.

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 the following ratio.

$$\text{Apple : Mango : Peach} = 6 : 15 : 17$$

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]

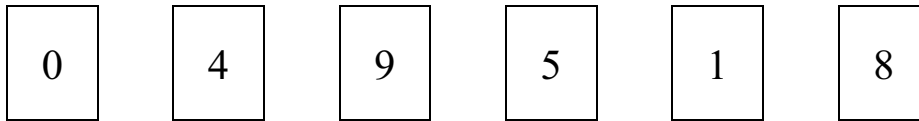
2 (a) (i) $f \times g = 90$

 f and g are both integers **greater than 1**.Write down one possible pair of values of f and g .Answer(a)(i) $f = \dots\dots\dots$ and $g = \dots\dots\dots$ [1]

(ii) Find all the prime factors of 90.

Answer(a)(ii) $\dots\dots\dots$ [3]

(b) Six number cards are shown below.



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,

Answer(b)(i) $\dots\dots\dots$ [1]

(ii) the largest 3-digit even number,

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

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

Answer(b)(iii) $\dots\dots\dots$ [1]

(iv) a cube number,

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

(v) a 2-digit multiple of 13,

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

(vi) the cube root of 64,

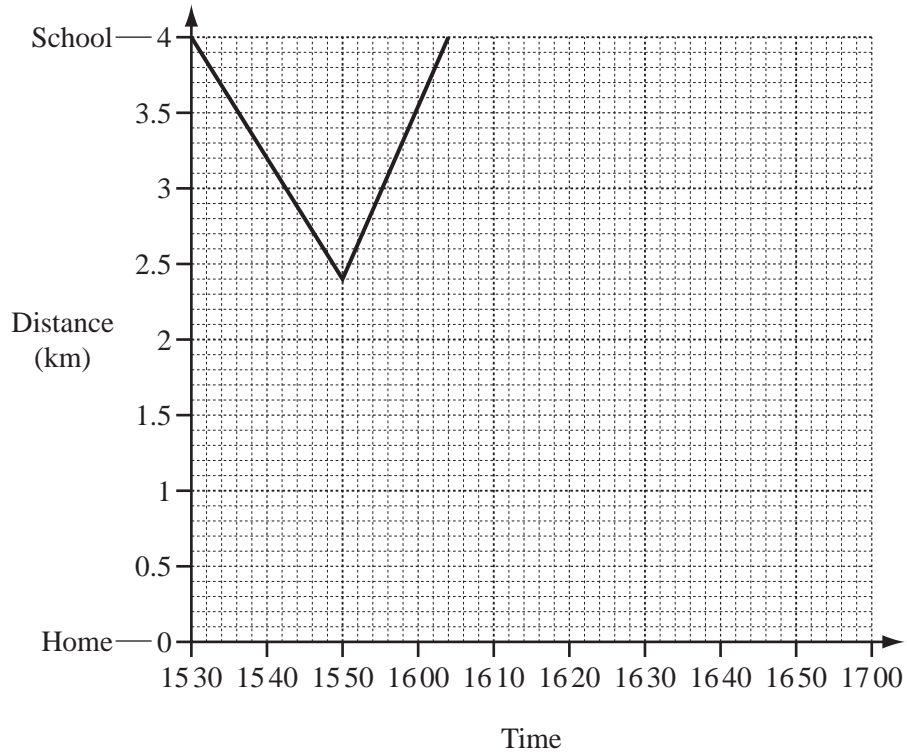
Answer(b)(vi) $\dots\dots\dots$ [1]

(vii) a prime number between 100 and 120.

Answer(b)(vii) $\dots\dots\dots$ [1]

- 3 Kim left school at 1530 to walk home. On the way home he remembered he had left a book at school. 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?

Answer(a)(i) [1]

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

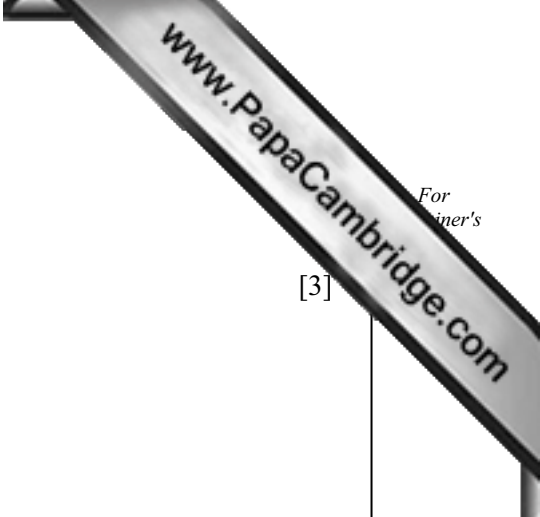
Answer(a)(ii) km [1]

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

Answer(a)(iii) min [1]

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

Answer(a)(iv) km/h [3]



(b) Kim spent 6 minutes at school collecting his book.
He then walked home at a speed of 6 km/h.

(i) Complete the travel graph. [3]

(ii) At what time did Kim arrive home?

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]

- 4 An accurate scale drawing of three sides of a garden, AB , BC , and CD is shown on the opposite page. A is due north of B and C is due east of B .

(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 $BQRS$. [1]
- (b) On the scale drawing, 1 centimetre represents 6 metres.

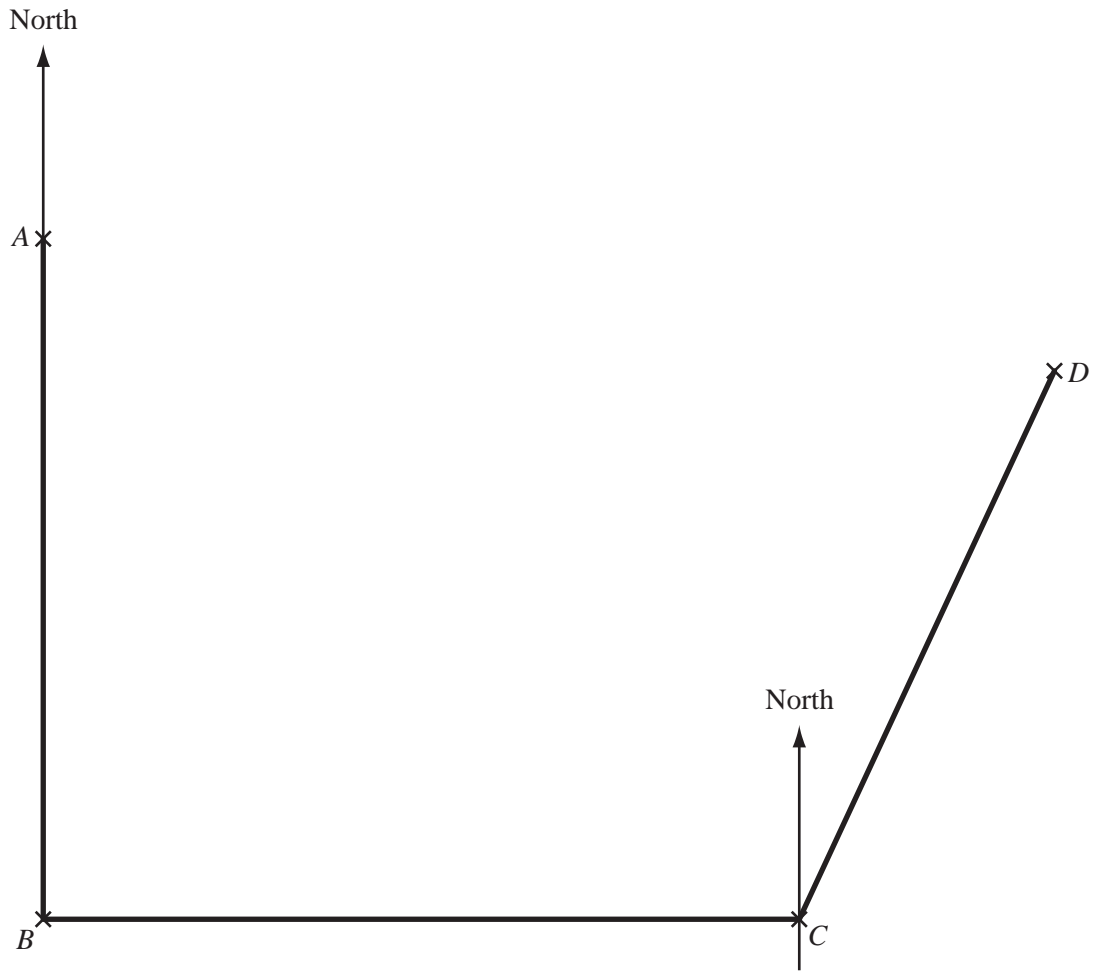
Calculate the vegetable area in square metres.

Answer(b) m² [3]

- (c) A tree, T , is on a bearing of 070° from A and 345° from C .

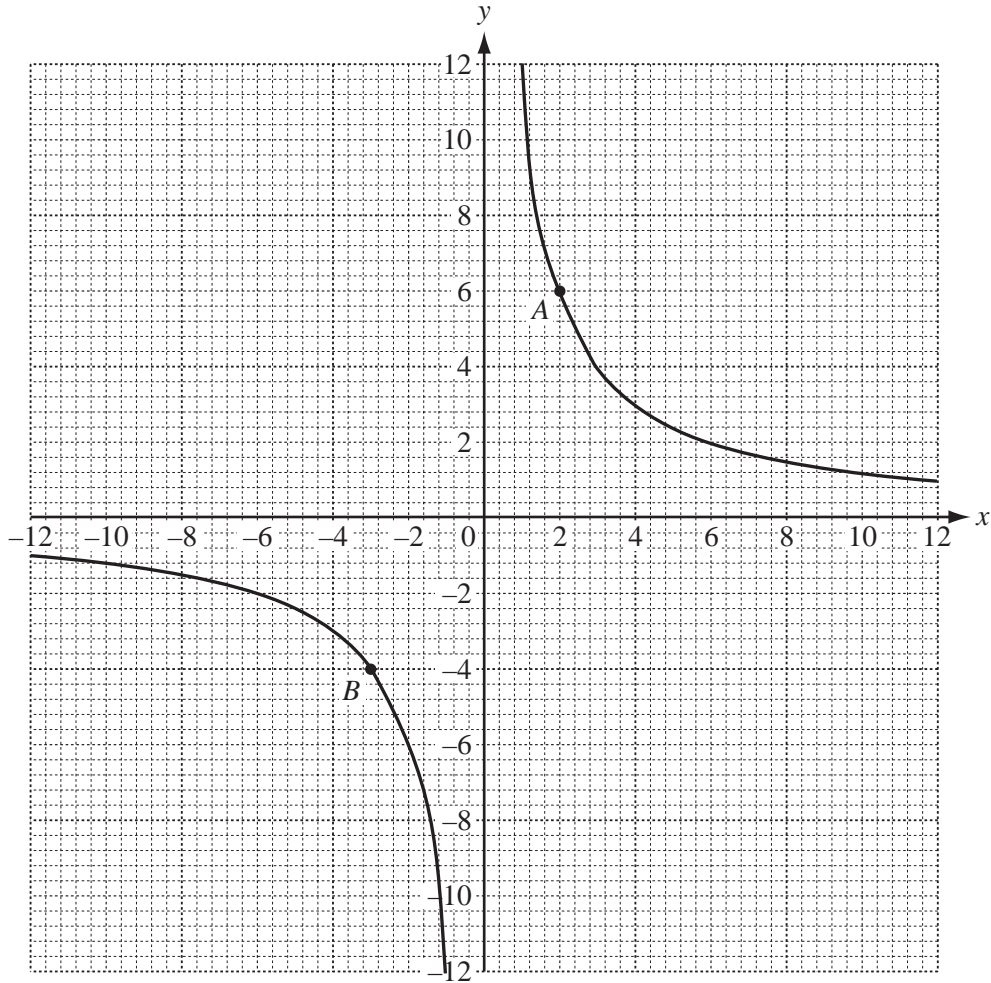
On the scale drawing, mark the position of T . [2]

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

Answer(a)(i) $A(\dots\dots\dots , \dots\dots\dots)$ and $B(\dots\dots\dots , \dots\dots\dots)$ [2]

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

Write down the value of n .

Answer(a)(ii) $n = \dots\dots\dots$ [1]

- (b) (i) Write down the order of rotational symmetry of the graph.

Answer(b)(i) [1]

- (ii) On the grid, draw the lines of symmetry of the graph. [2]

- (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 x co-ordinates of the points where this line meets each curve.
Give your answers to 1 decimal place.

Answer(c)(i) $x =$ and $x =$ [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)**. [1]

- (iii) Write down the equation of this line in the form $y = mx + c$.

Answer(c)(iii) $y =$ [2]

- 6 (a) The formula for finding the interior angle of a regular polygon with n sides is given below

$$\text{Interior angle} = \frac{180(n-2)}{n}$$

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

Answer(a)(i) [2]

- (ii) Multiply out the brackets.

$$180(n-2)$$

Answer(a)(ii) [1]

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

How many sides does this polygon have?

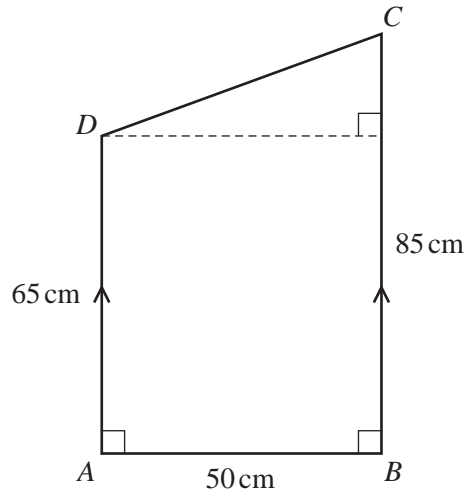
Answer(a)(iii) [3]

- (b) Solve the simultaneous equations.

$$\begin{aligned} 3x + 5y &= 9 \\ x + 2y &= 4 \end{aligned}$$

Answer(b) $x =$

$y =$ [3]



NOT TO SCALE

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 $ABCD$.

Answer(a) [1]

- (b) Calculate angle DCB .

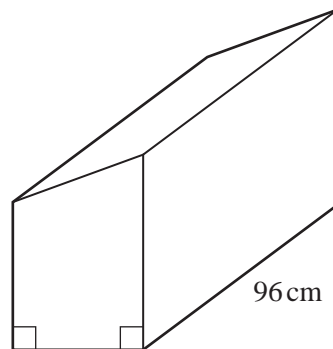
Answer(b) Angle $DCB =$ [3]

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

Answer(c) cm^2 [2]

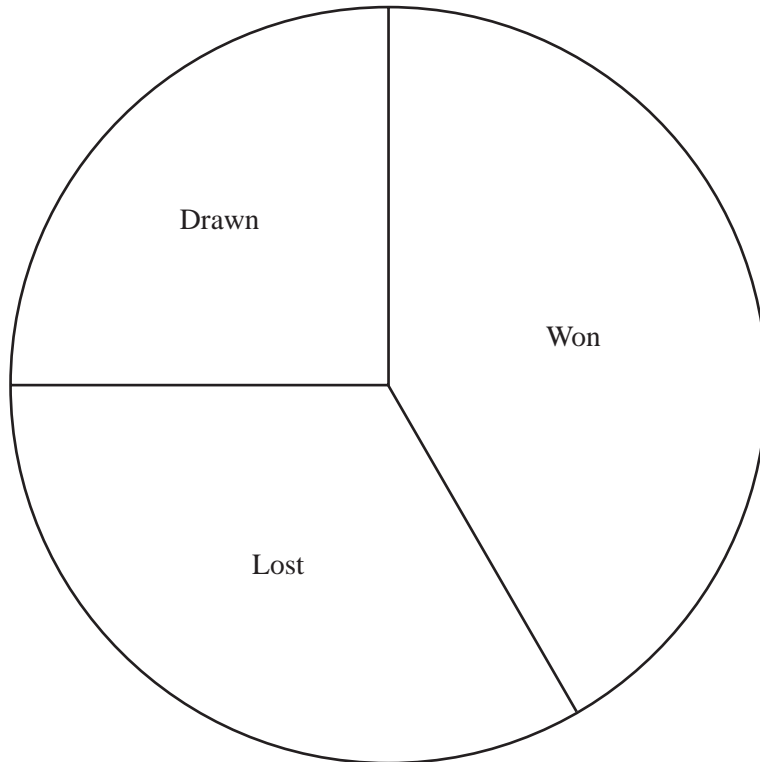
- (d) The storage box is 96 cm long.

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 the pie chart below.



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

Answer(a)(i)

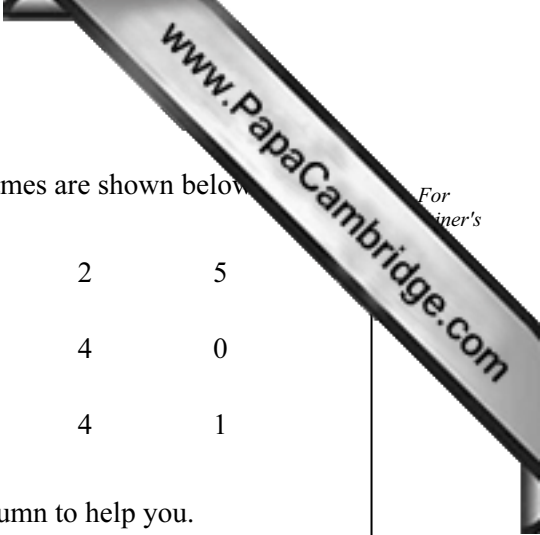
[2]

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

Answer(a)(ii) Lost

Drawn

[3]



(b) The number of goals scored by the hockey team in each of the 24 games are shown below.

0 2 1 1 0 3 2 5
 3 0 2 3 2 1 4 0
 2 1 2 1 0 1 4 1

(i) Complete the frequency table below. You may use the tally column to help you.

Number of goals per game	Tally	Number of games
0		
1		
2		
3		
4		
5		

[2]

(ii) Write down the mode.

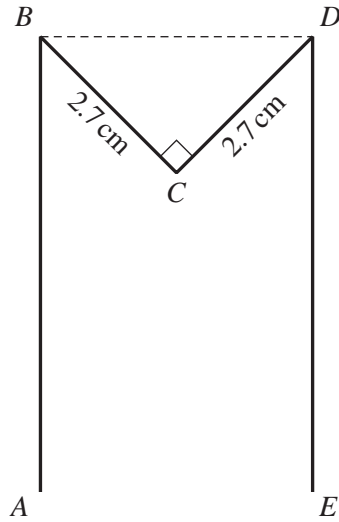
Answer(b)(ii) [1]

(iii) Find the median.

Answer(b)(iii) [2]

(iv) Calculate the mean number of goals per game.

Answer(b)(iv) [3]



NOT TO SCALE

- (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 .

Answer(a)(i) $BD =$ cm [2]

- (ii) Complete the statement.

Triangle BCD is right-angled and [1]

- (iii) Find the size of angle ABC .

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

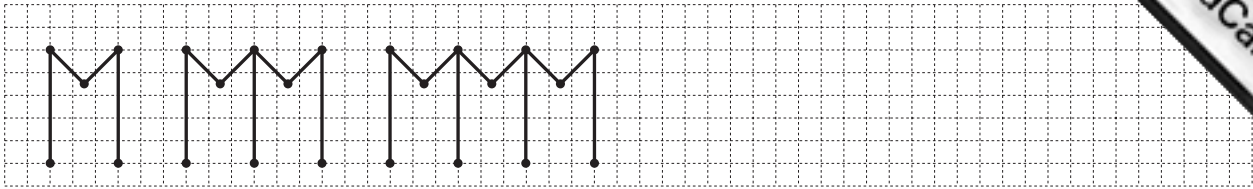


Diagram 1

Diagram 2

Diagram 3

Diagram 4

(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,

Answer(c)(i)

[1]

(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]

