



1 A drink consists of water and fruit juice.

(a) 24% of the drink is water.

Show that there is a total of  $760 \text{ cm}^3$  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  $760 \text{ cm}^3$  of fruit juice in one litre of the drink is made from apple, mango and peach in the following ratio.

Apple : Mango : Peach = 6 : 15 : 17

Calculate the amount of apple juice.

*Answer(c)* .....  $\text{cm}^3$  [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]

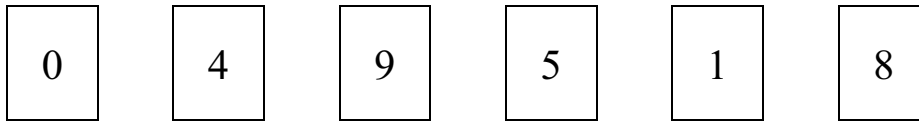
2 (a) (i)  $f \times g = 90$

 $f$  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
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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,

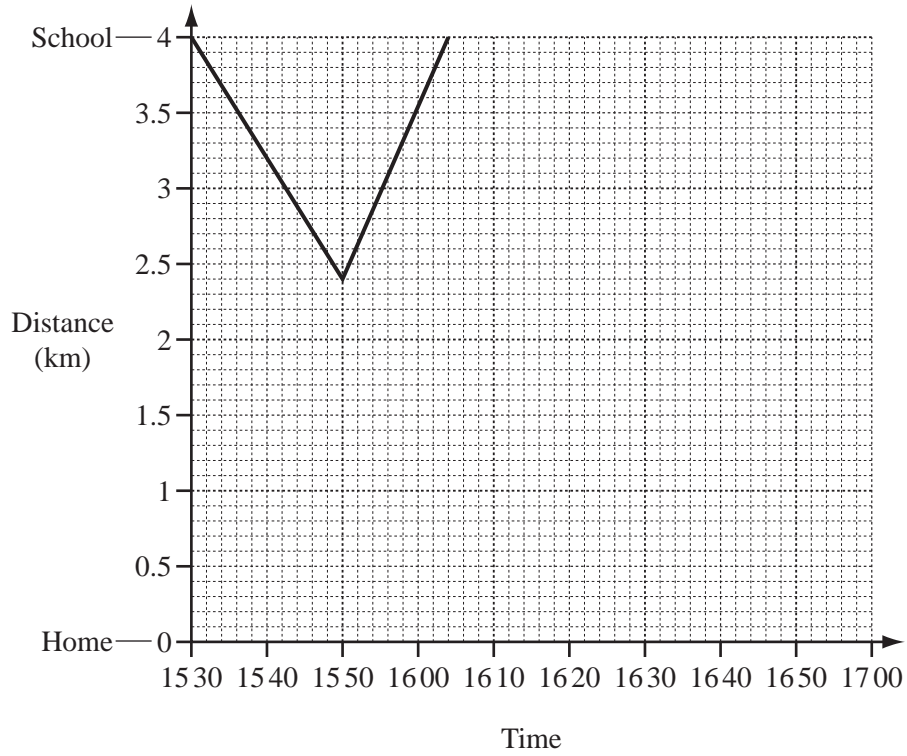
Answer(b)(vi)  $\dots\dots\dots$  [1]

(vii) a prime number between 100 and 120.

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

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- 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

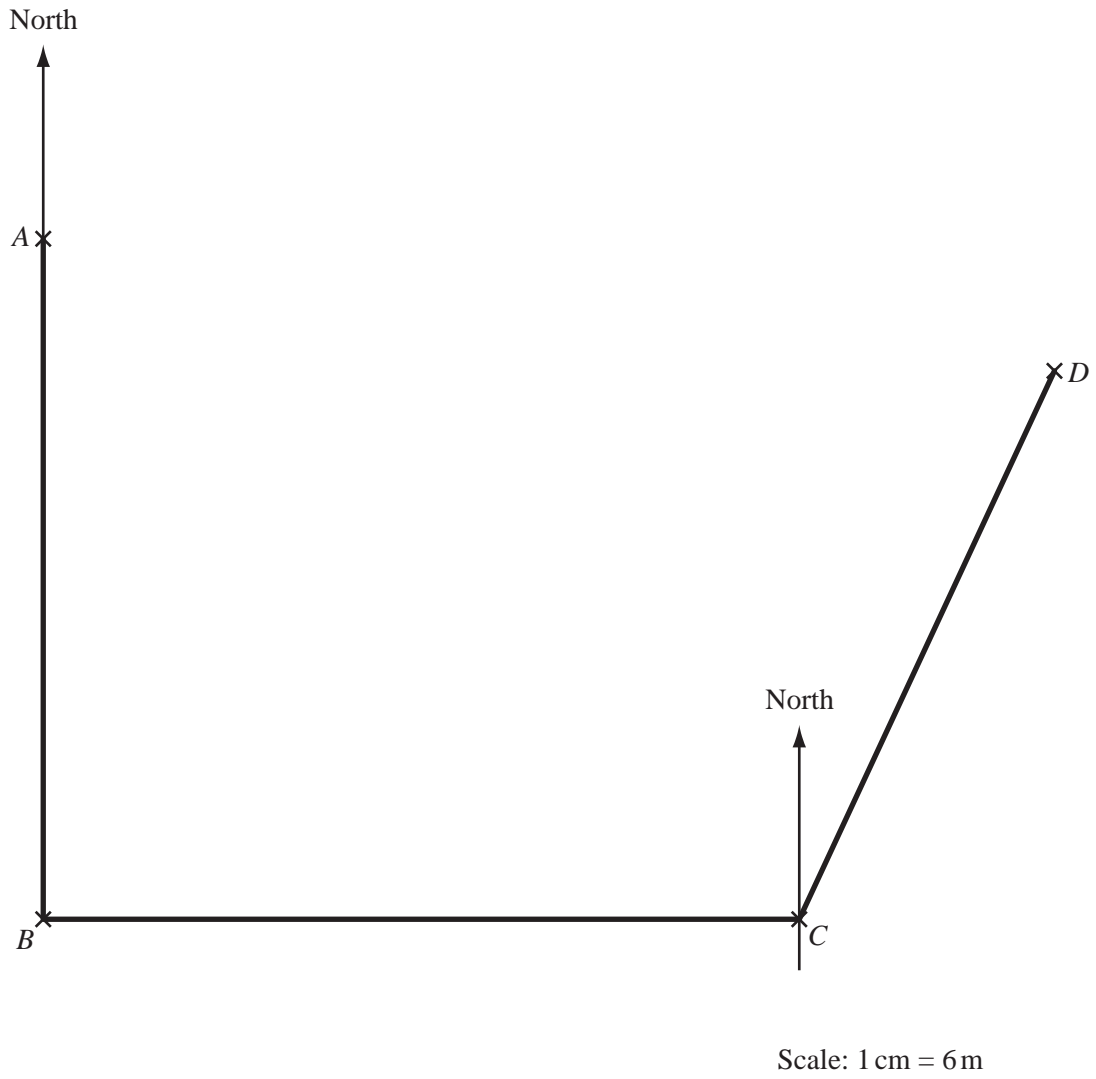
- (i) construct the perpendicular bisector of  $BC$ , [2]
- (ii) mark the point  $S$  at the midpoint of  $BC$ , [1]
- (iii) construct the bisector of angle  $ABC$ , [2]
- (iv) mark the point  $R$  where this line crosses the perpendicular bisector of  $BC$ , [1]
- (v) mark the point  $Q$  on  $BA$  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.

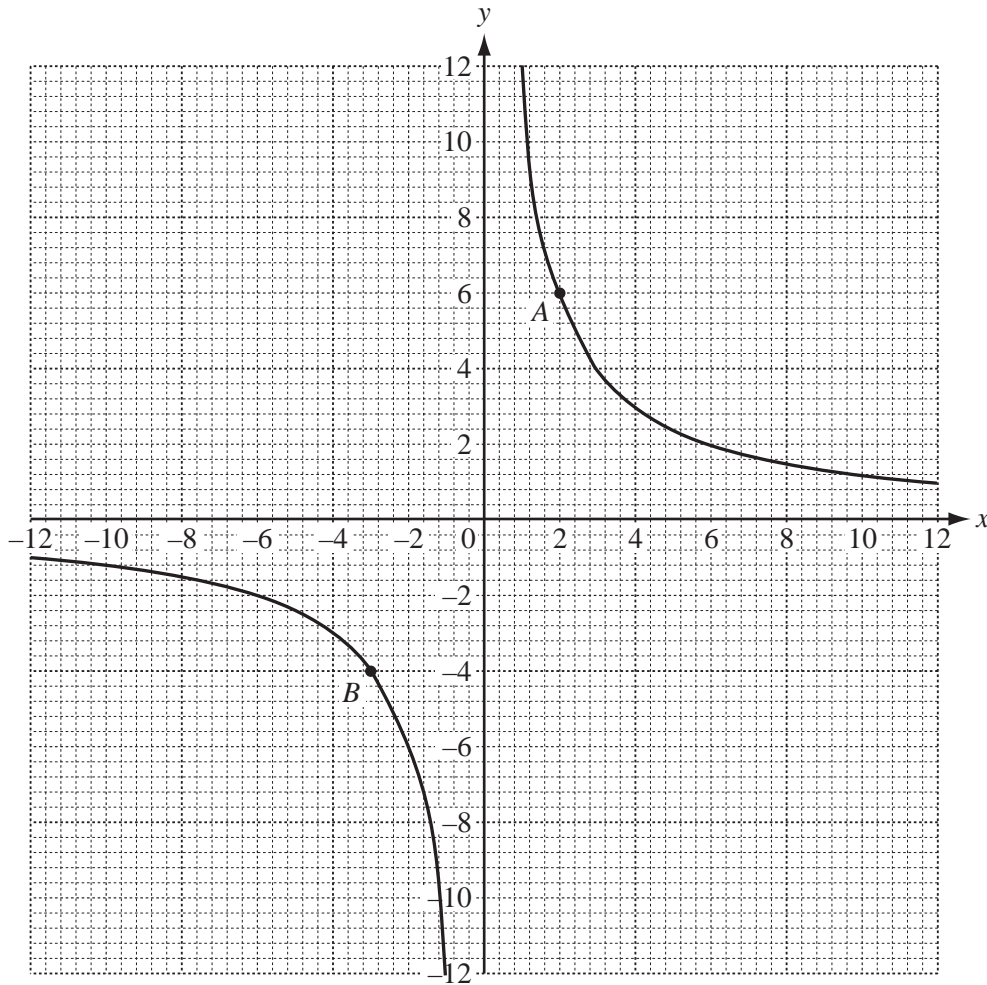
Answer(b) ..... m<sup>2</sup> [3]

- (c) A tree,  $T$ , is on a bearing of  $070^\circ$  from  $A$  and  $345^\circ$  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]





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]

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

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

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(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  $156^\circ$ .

How many sides does this polygon have?

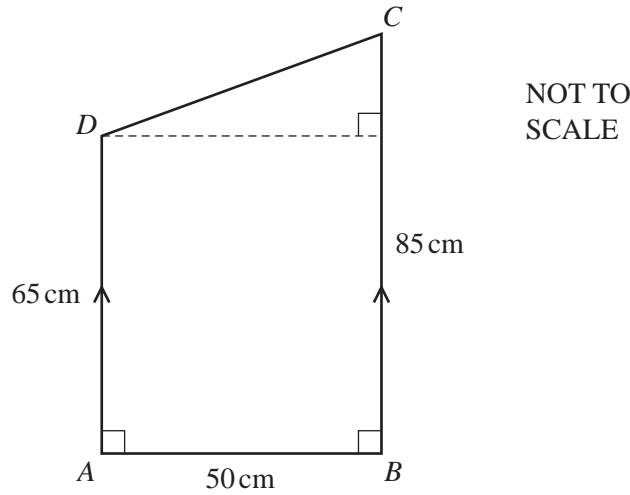
Answer(a)(iii) ..... [3]

(b) Solve the simultaneous equations.

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

Answer(b)  $x =$  .....

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



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  $DCB$ .

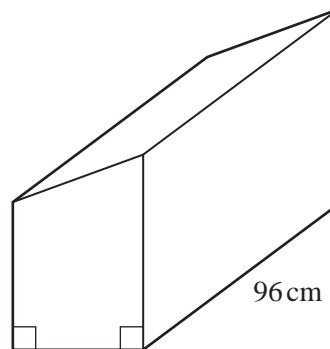
Answer(b) Angle  $DCB =$  ..... [3]

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

Answer(c) .....  $\text{cm}^2$  [2]

(d) The storage box is 96 cm long.

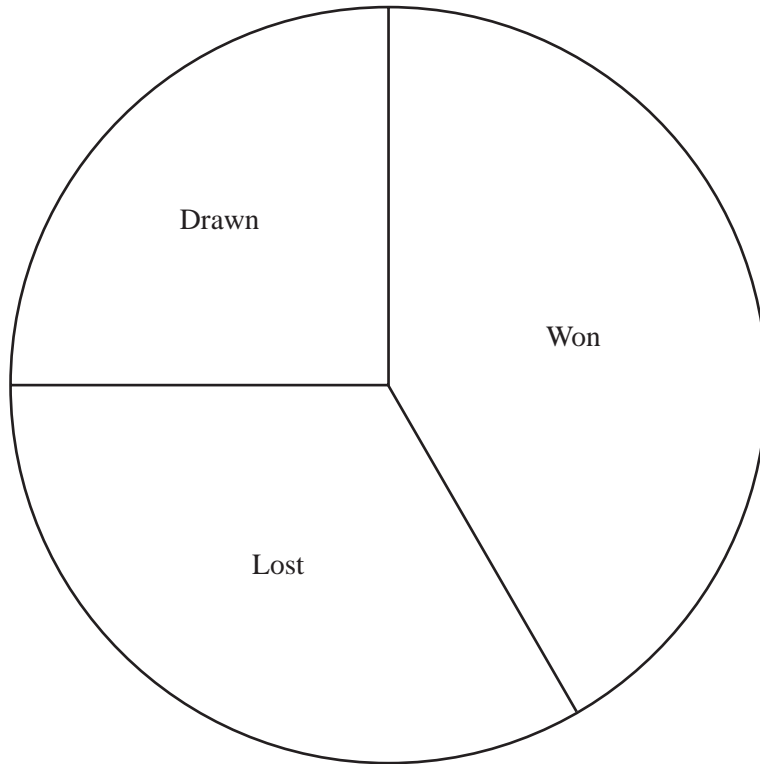
Calculate the volume of the box.  
 Write down the units of your answer.



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.

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- (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

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(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.

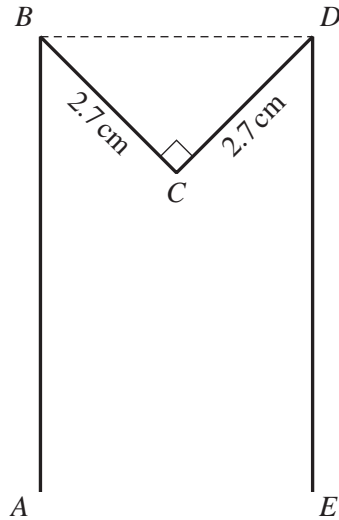
Answer(b)(ii) ..... [1]

(iii) Find the median.

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

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

Answer(b)(iv) ..... [3]



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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  $BD$ .

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]

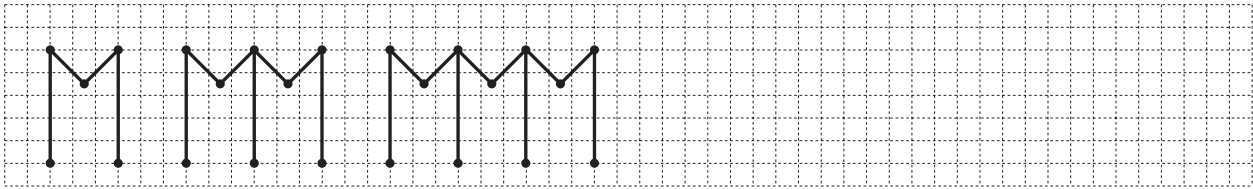


Diagram 1

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]

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