

1 Juana is travelling by plane from Spain to England.

- (a) Her case weighs 17.2 kilograms.
The maximum weight allowed is 20 kilograms.
By how much is the weight of her case below the maximum allowed?

Answer (a) kg [1]

- (b) She changes 150 euros (€) into pounds (£).
The exchange rate is €1 = £0.71.
Calculate how much she receives.

Answer (b) £ [1]

- (c) She travels from her home to the airport by train.
She catches a train at 09 55 and the journey takes 45 minutes.

- (i) Write down the time she arrives at the airport.

Answer (c)(i) [1]

- (ii) She has to wait until 12 10 to get on her plane.
Work out how long she has to wait.

Answer (c)(ii) h min [1]

- (d) The plane takes off at 12 40 Spanish time, which is 11 40 English time.
The flight takes $2\frac{1}{4}$ hours.
What is the time in England when she arrives?

Answer (d) [1]

- (e) The plane has seats for 420 passengers.
15% of the seats are empty.
How many passengers are on the plane?

Answer (e) [3]

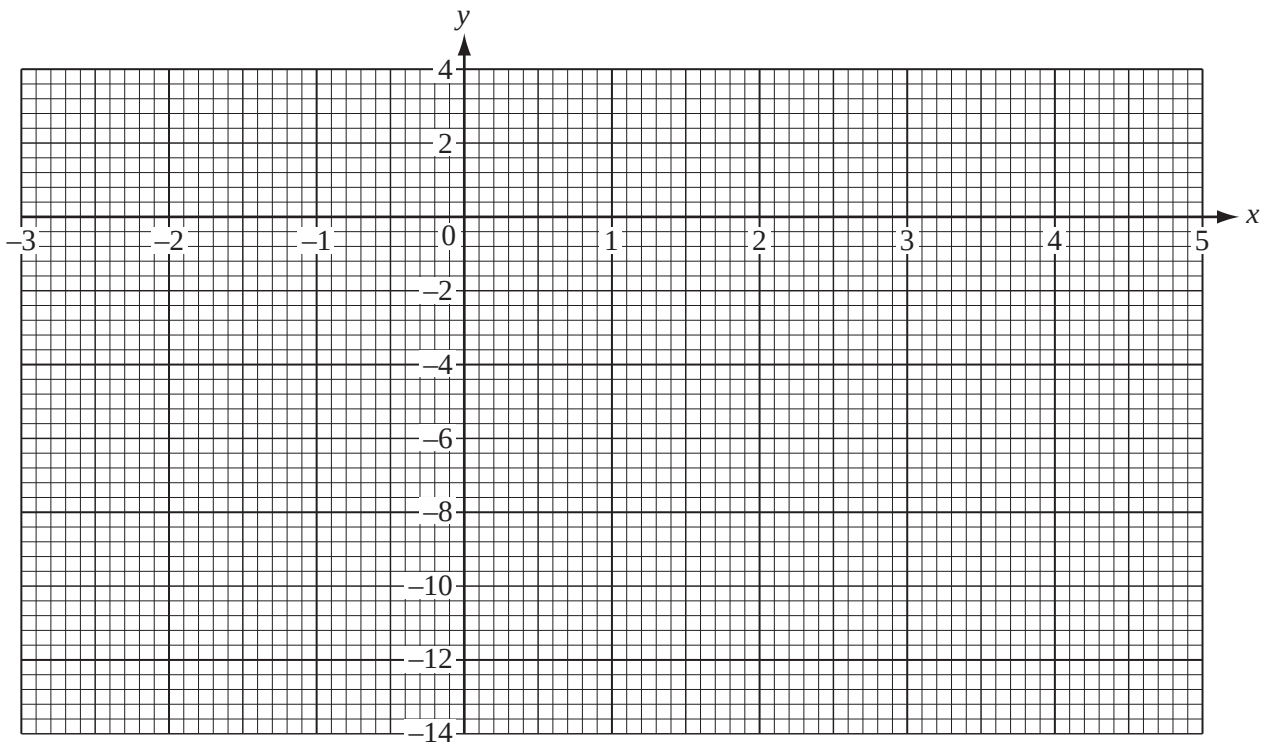
- 2 (a) Complete the table of values for $y = 1 + 2x - x^2$.

x	-3	-2	-1	0	1	2	3	4	5
y	-14	-7				1	-2		-14

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[3]

- (b) Draw the graph of $y = 1 + 2x - x^2$ on the grid below.



[4]

- (c) Use your graph to find the solutions to the equation $1 + 2x - x^2 = 0$.

Answer (c) $x =$

or $x =$ [2]

- (d) (i) On the grid, draw the line of symmetry of the graph. [1]

- (ii) Write down the equation of this line of symmetry.

Answer(d)(ii) [1]

3

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	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Minimum temperature °C	4	6	0	-2	-4	2	
Maximum temperature °C	8	10	5	7	2	7	

The table shows the minimum and maximum temperatures on six days of a week.

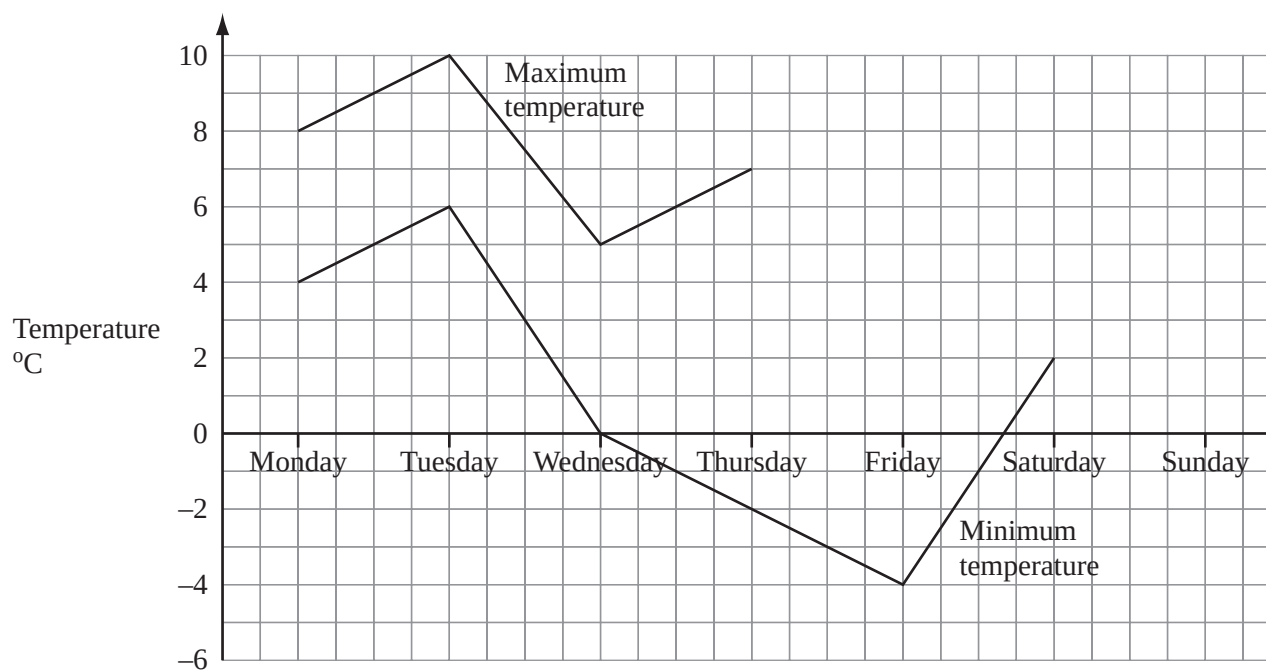
- (a) (i) On Sunday the minimum temperature was 5°C lower than on Saturday.
The maximum temperature was 2°C higher than on Saturday.
Use this information to complete the table.

[2]

- (ii) Find the difference between the minimum and maximum temperatures on Thursday.

Answer(a)(ii) $^{\circ}\text{C}$ [1]

- (b) Use the table to complete the graphs below for all seven days.



[2]

(c) Use your graphs to find

(i) on how many days the temperature fell below -1°C ,

Answer(c)(i) [1]

(ii) which day had the largest difference between minimum and maximum temperatures.

Answer(c)(ii) [1]

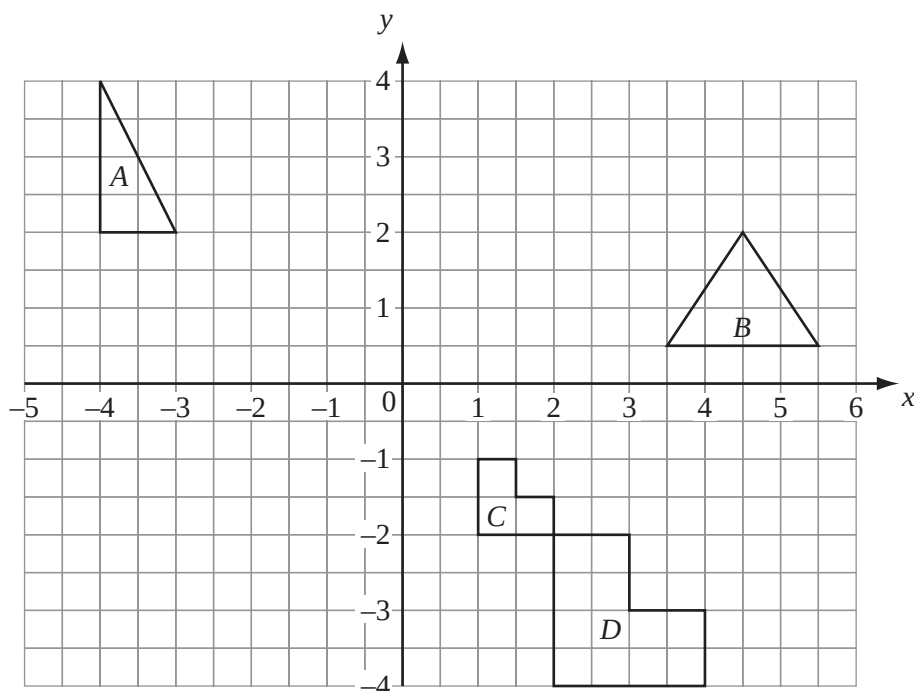
(d) The formula for changing degrees Celsius (C) to degrees Fahrenheit (F) is

$$F = \frac{9C}{5} + 32.$$

Use the formula to change 6 degrees Celsius to degrees Fahrenheit.
Show all your working.

Answer(d) [2]

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- (a) A translation is given by $\begin{pmatrix} 6 \\ 3 \end{pmatrix} + \begin{pmatrix} -3 \\ -4 \end{pmatrix}$.

(i) Write this translation as a single column vector.

Answer(a)(i) $\begin{pmatrix} \\ \end{pmatrix}$ [2]

(ii) On the grid, draw the translation of triangle A using this vector. [2]

- (b) Another translation is given by $-2 \begin{pmatrix} 1 \\ -1 \end{pmatrix}$

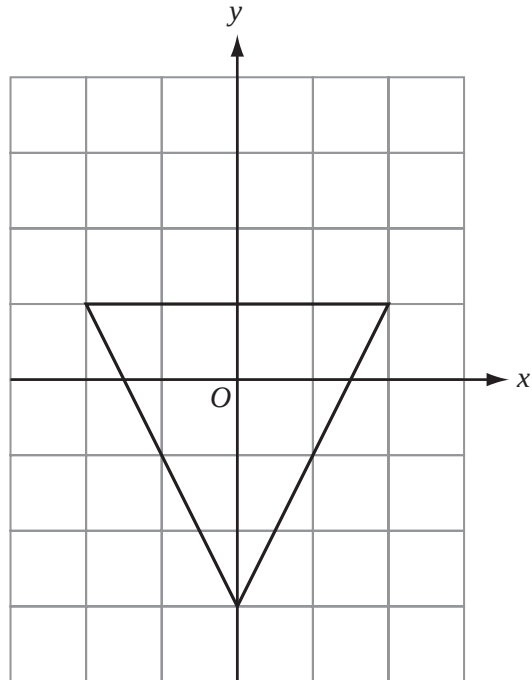
(i) Write this translation as a single column vector.

Answer(b)(i) $\begin{pmatrix} \\ \end{pmatrix}$ [2]

(ii) On the grid, draw the translation of triangle B using this vector. [2]

- (c) Describe fully the single transformation that maps shape C onto shape D .

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

(d)

The triangle in the diagram above is isosceles.

- (i)** How many lines of symmetry does this triangle have?

Answer(d)(i) [1]

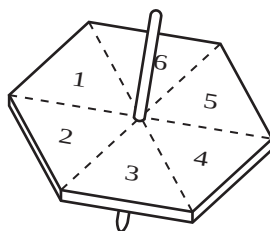
- (ii)** Write down the order of rotational symmetry of this triangle.

Answer(d)(ii) [1]

- (iii)** On the grid above, draw the rotation of this triangle about O through 180° . [2]

- (iv)** Describe fully another single transformation that maps this triangle onto your answer for part **(d)(iii)**.

Answer(d)(iv) [2]



- (a) Asif tests a six-sided spinner.

The results of 60 spins are shown below.

3	3	6	5	6	1	2	6	5	2
3	4	4	4	3	4	6	5	2	1
6	3	6	4	1	5	3	6	2	6
6	6	3	6	1	6	6	5	1	6
1	6	2	5	3	6	4	2	3	5
1	4	4	1	5	4	6	6	2	3

- (i) Use these results to complete the frequency table.

Number	Frequency
1	
2	
3	
4	
5	
6	

[3]

- (ii) Write down the mode.

Answer(a)(ii) [1]

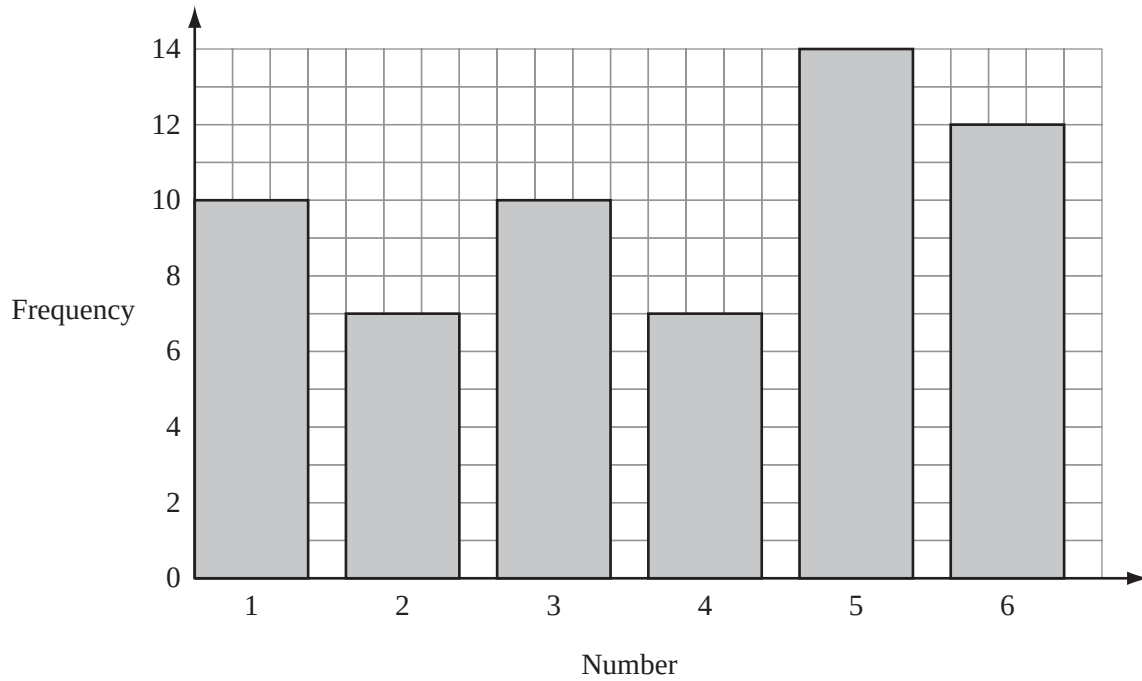
- (iii) Find the median.

Answer(a)(iii) [2]

- (iv) Calculate the mean.
Give your answer correct to one decimal place.

Answer(a)(iv) [3]

- (b) Asif tests a **different** six-sided spinner.
He draws a bar chart to show the results.



- (i) How many times did he spin this spinner?

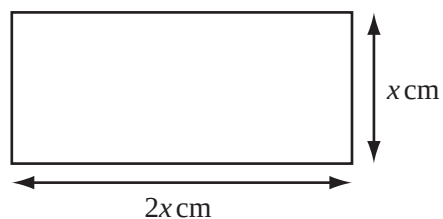
Answer(b)(i) [2]

- (ii) Calculate the mean score for this spinner.

Answer(b)(ii) [3]

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6 (a)

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The perimeter of the rectangle in the diagram above is 36 centimetres.

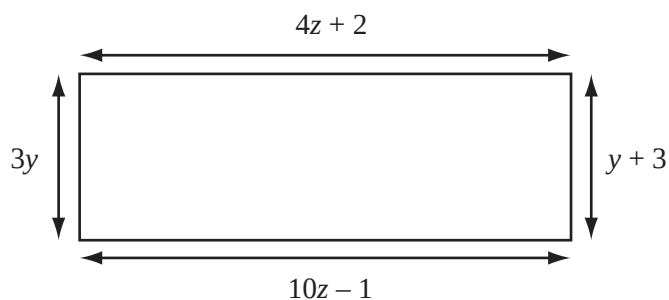
- (i) Find the value of x .

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

- (ii) Using this value of x , calculate the area of the rectangle.

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

(b)

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The diagram above shows another rectangle.

- (i) In this rectangle $3y = y + 3$.
Solve the equation to find y .

Answer(b)(i) $y =$ [2]

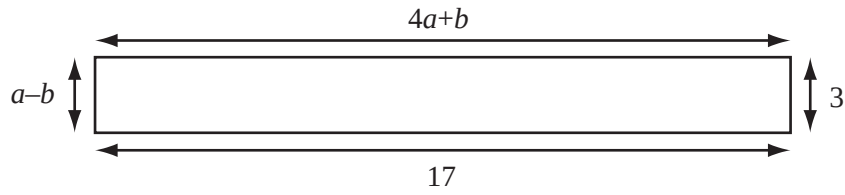
- (ii) Write down an equation in z .

Answer(b)(ii) [1]

- (iii) Solve the equation in part (b)(ii) to find z .

Answer(b)(iii) $z =$ [3]

(c)

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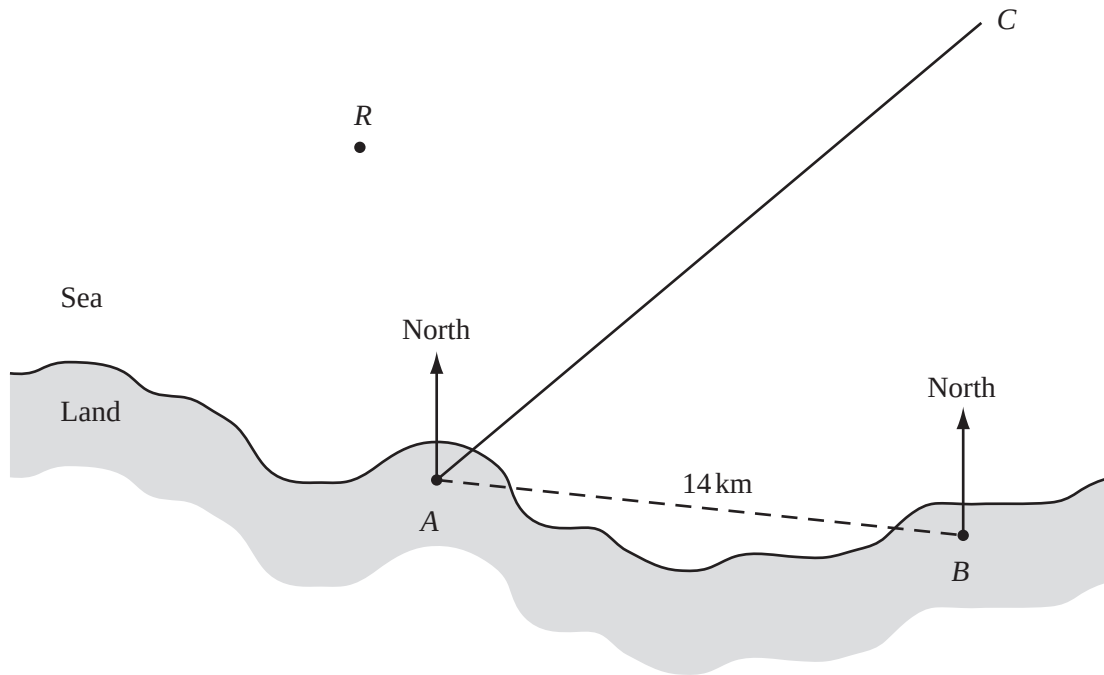
The diagram above shows another rectangle.

(i) Write down two equations in a and b .

Answer(c)(i)
 [2]

(ii) Solve these two equations simultaneously to find a and b .

Answer(c)(ii) $a =$
 $b =$ [3]



At midday, a ship is somewhere along the line from A to C .

- (a) By measuring an angle, write down the three figure bearing of the ship from A .

Answer(a) [2]

- (b) The coastguard at B sees the ship on a bearing of 350° .

(i) On the diagram draw accurately the line showing a bearing of 350° from B . [1]

(ii) On the diagram mark the position of the ship, S . [1]

- (c) (i) Measure the length, in centimetres, of the line AB on the diagram.

Answer(c)(i) cm [1]

- (ii) The distance from A to B is 14 kilometres.
Calculate the scale of the drawing.
Give your answer in the form $1:n$.

Answer(c)(ii) 1: [2]

- (d) The ship is sailing straight for the rocks, R .

There is a lighthouse at A .

The range of the light from the lighthouse is 10 kilometres.

- (i) Using your scale, draw the locus of points that are 10 kilometres from A . [2]

- (ii) Draw the line SR on the diagram.

How far is the ship from the rocks when the light from the lighthouse is first seen on the ship?

Answer(d)(ii) km [2]

- (e) If the ship does not alter course it will hit the rocks at 12 40.

A lifeboat sets off from the coastguard station, B , at 12 00 and sails straight towards the rocks.

- (i) Measure and calculate the distance, in kilometres, from the coastguard station, B , to the rocks, R .

Answer(e)(i) km [2]

- (ii) Calculate the speed, in kilometres per hour, at which the lifeboat must sail to reach the rocks by 12 40.

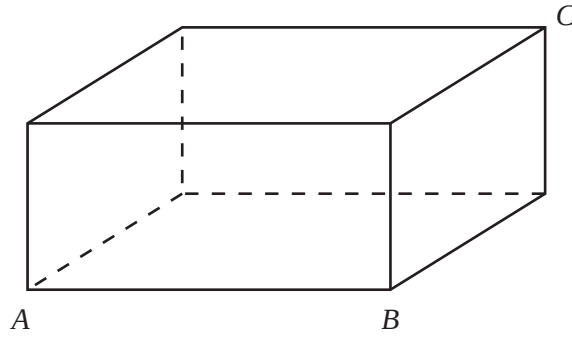
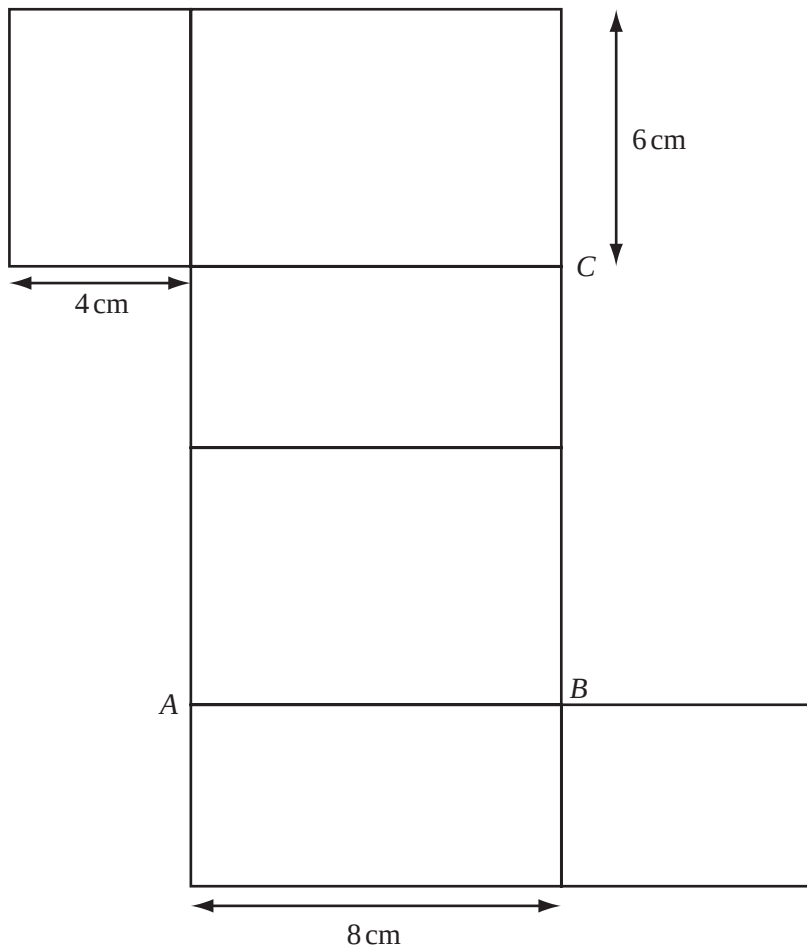
Answer(e)(ii) km/h [3]

- (iii) A knot is 1 nautical mile per hour.

One nautical mile is equal to 1.85 kilometres.

Calculate the speed found in part (e)(ii) in knots.

Answer(e)(iii) knots [2]

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The diagram above shows a cuboid and its net.

(a) Calculate the total surface area of the cuboid.

Answer(a) cm^2 [3]

- (b) Calculate the volume of the cuboid.

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Answer(b) cm^3 [2]

- (c) An ant walks directly from A to C on the surface of the cuboid.

- (i) Draw a straight line on the net to show this route. [1]

- (ii) **Calculate** the length of the ant's journey.

Answer(c)(ii) cm [3]

- (iii) **Calculate** the size of angle CAB on the net.

Answer(c)(iii) Angle CAB = [3]

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