

- 1 (a) (i) 1, 2 and 36 are factors of 36.

Write down all the other factors of 36.

Answer(a)(i) [2]

- (ii) 1 and 2 are common factors of 36 and 90.

Write down two more common factors of 36 and 90.

Answer(a)(ii) [2]

- (b) Write down all the square numbers between 20 and 50.

Answer(b) [3]

- (c) p and q are prime numbers.

$$p^3 \times q = 56$$

Find p and q .

Answer(c) $p =$

$q =$ [2]

- 2 Francis earns \$150 per week.
 He has \$132 left after he pays his tax.

(a) Calculate what percentage of his \$150 he pays in tax.

Answer(a) % [3]

(b) He divides the \$132 between expenses, savings and family in the ratio

$$\text{Expenses : Savings : Family} = 15 : 7 : 11.$$

Calculate his expenses.

Answer(b) \$ [3]

(c) His rent is \$24 per week.

What fraction of the \$132 is this?
 Give your answer as a fraction in its simplest form.

Answer(c) [2]

(d) His earnings of \$150 per week increase by 8%.

Calculate his new earnings.

Answer(d) \$ [2]

- 3 Mrs Sesay leaves home by car at 13 30.
After 15 minutes she stops at a shopping centre, 8 kilometres from home.

- (a) Calculate the average speed for her journey.
Give your answer in kilometres per hour.

Answer(a) km/h [2]

- (b) She leaves the shopping centre half an hour later.
She travels a further 12 kilometres at the speed of 36 km/h to Villeneuve.

- (i) Write down the time when she leaves the shopping centre.

Answer(b)(i) [1]

- (ii) Calculate the time, in minutes, that she takes to travel from the shopping centre to Villeneuve.

Answer(b)(ii) min [2]

- (iii) On the grid opposite, complete the travel graph showing her journey. [2]

- (c) Her son, Braima, also leaves home at 13 30 and cycles the 20 kilometres to Villeneuve.
He cycles at a speed of 15 km/h.

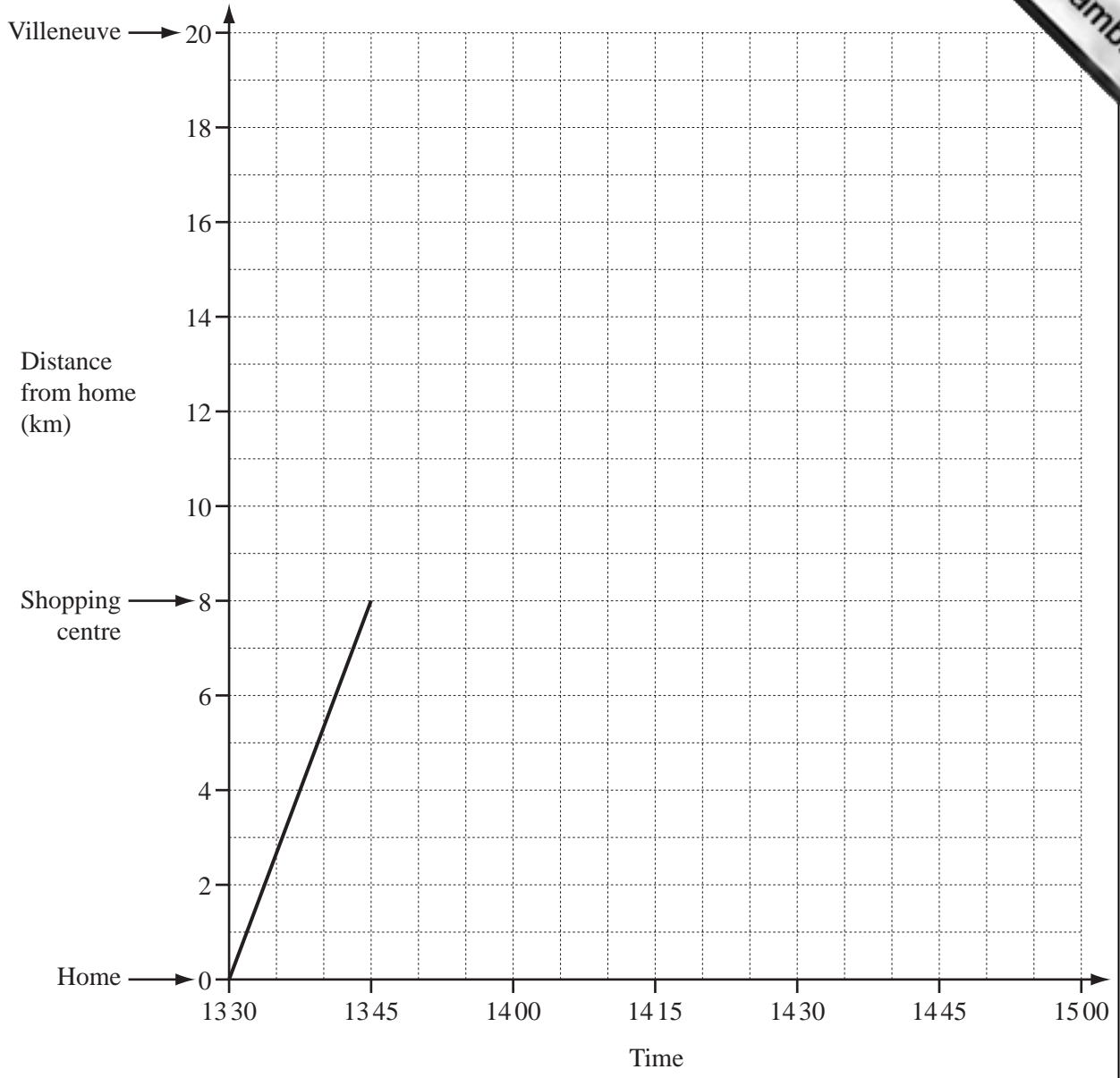
- (i) Calculate how long his journey takes.
Give your answer in hours and minutes.

Answer(c)(i) h min [2]

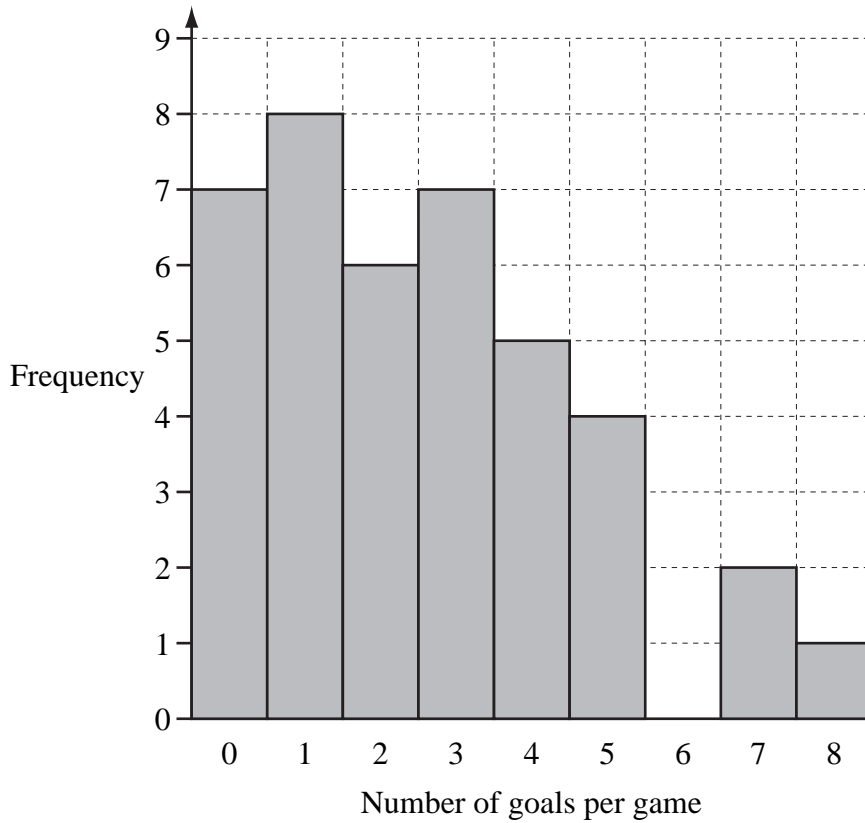
- (ii) Show his journey on the grid. [1]

- (iii) How many minutes after his mother does Braima arrive at Villeneuve?

Answer(c)(iii) min [1]



4



Karen keeps a record of how many goals United score in each of 40 games. She draws a bar chart to show this information.

(a) Use the information in the bar chart to complete the frequency table below.

Number of goals per game	0	1	2	3	4	5	6	7	8
Frequency							0	2	1
Frequency \times Number of goals							0	14	8

[2]

(b) (i) How many goals did United score in the 40 games?

Answer(b)(i)

[1]

(ii) Calculate the mean number of goals scored per game.

Answer(b)(ii)

[2]

(iii) Find the median.

Answer(b)(iii) [2]

(iv) Write down the mode.

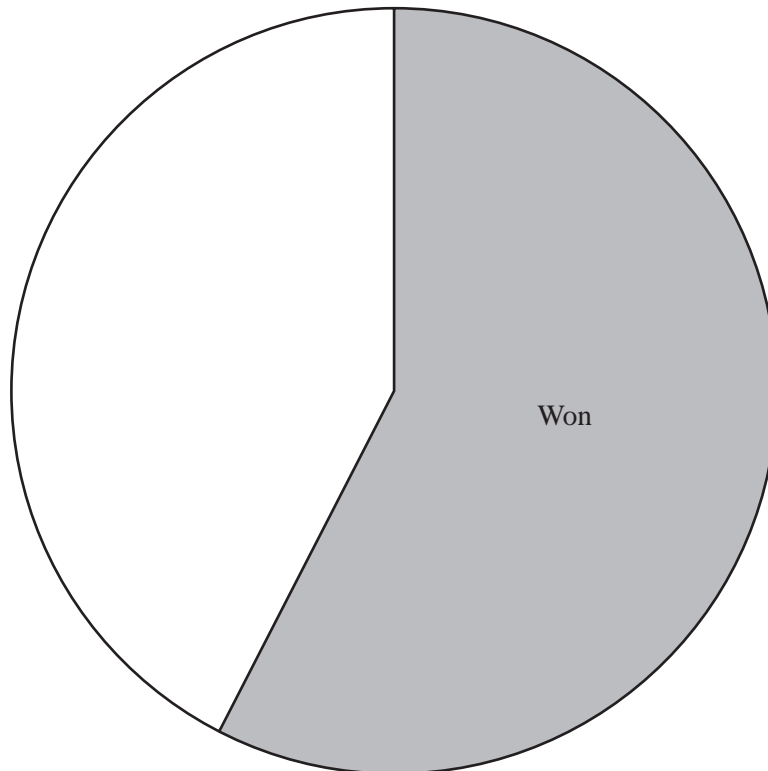
Answer(b)(iv) [1]

(c) United won 23 games and lost 12 games.
The other games ended in a draw.

(i) How many games ended in a draw?

Answer(c)(i) [1]

(ii) Complete the pie chart accurately to represent these results. Label the sectors.



[2]

(d) If one game from the 40 is chosen at random, use the information in **part (c)** to find the probability that United

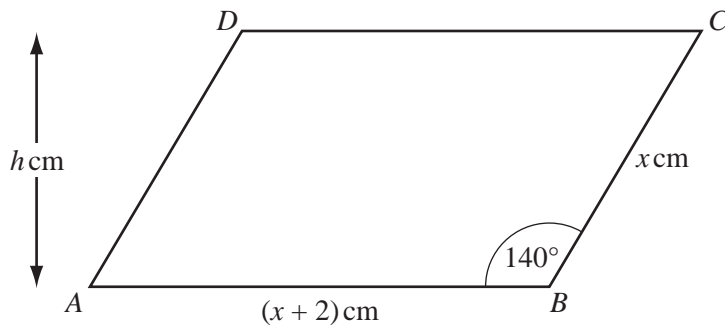
(i) won,

Answer(d)(i) [1]

(ii) did not draw.

Answer(d)(ii) [1]

5

NOT TO
SCALE

In the parallelogram $ABCD$, $AB = (x + 2)$ cm, $BC = x$ cm and angle $ABC = 140^\circ$.

(a) When $x = 10$,

(i) use trigonometry to calculate the height, h cm, of the parallelogram,

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

(ii) calculate the area of the parallelogram.

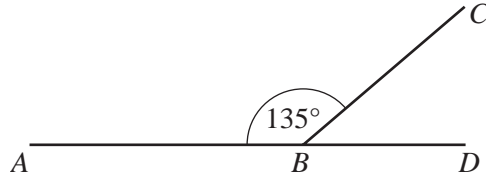
Answer(a)(ii) cm^2 [1]

(b) For a **different** value of x , the perimeter of the parallelogram is 38 cm.

Write down an equation in x and solve it.

Answer(b) $x =$ [3]

6 (a)



NOT TO SCALE

In the diagram, ABD is a straight line and angle $ABC = 135^\circ$.

(i) Find the size of angle CBD .

Answer(a)(i) Angle $CBD = \dots\dots\dots$ [1]

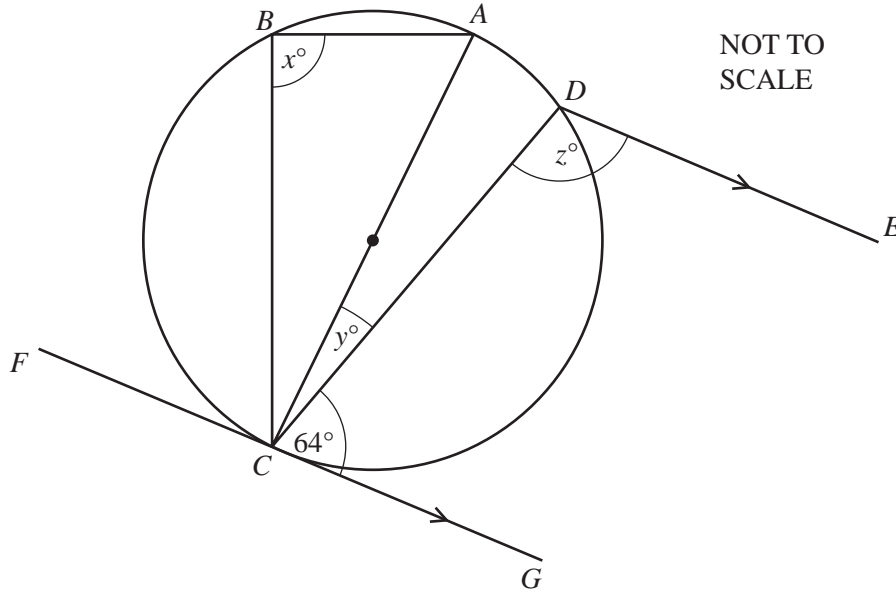
(ii) A regular polygon has interior angles of 135° .
Find the number of sides of the polygon.

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

(iii) Write down the name of the polygon in **part (a)(ii)**.

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

(b)



NOT TO SCALE

$A, B, C,$ and D lie on a circle. AC is a diameter.
 FCG is a tangent to the circle at C . DE is parallel to CG .
Find the values of x, y and z .

Answer(b) $x = \dots\dots\dots$

$y = \dots\dots\dots$

$z = \dots\dots\dots$ [5]

- 7 An area of land $ABCDEF$ is in the shape of a hexagon.
Part of a scale drawing of the land is shown on the opposite page.
A pond, P , is inside the hexagon.
On the plan, 1 centimetre represents 20 metres.

**Parts (a), (b), (c) and (f) must be completed using a ruler and compasses only.
All construction arcs must be clearly shown.**

- (a) On the land, $AF = 80$ m and $EF = 100$ m.

On the scale drawing, find the point F , by construction.
Draw the lines AF and EF . [2]

- (b) On the scale drawing, construct the perpendicular bisector of CD .
Label the point M where the bisector crosses CD . [2]

- (c) On the scale drawing, construct the bisector of angle BCD . [2]

- (d) The bisectors from **part (b)** and **part (c)** meet at L .

- (i) Measure and write down the length of LM in centimetres.

Answer(d)(i) cm [1]

- (ii) Find the distance between L and M on the land.
Give your answer in metres.

Answer(d)(ii) m [1]

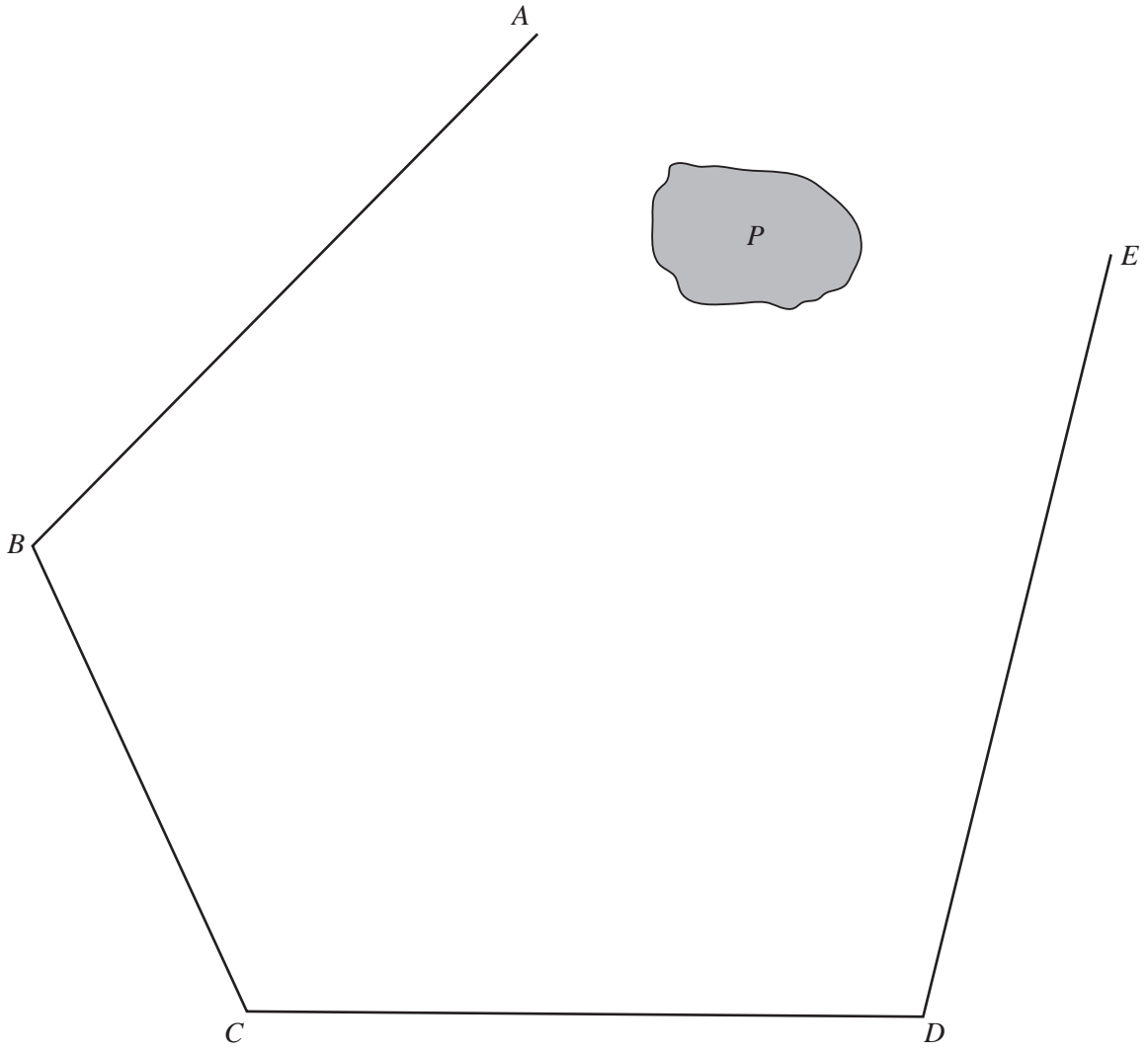
- (e) Triangle CML is a field for sheep.

Calculate the area of this field.

Answer(e) m^2 [2]

- (f) There is also a field for cows inside the hexagon.
This field is the region nearer to D than to C **and** less than 120 m from D .

By constructing a suitable locus on the scale drawing, find and label this region R . [2]

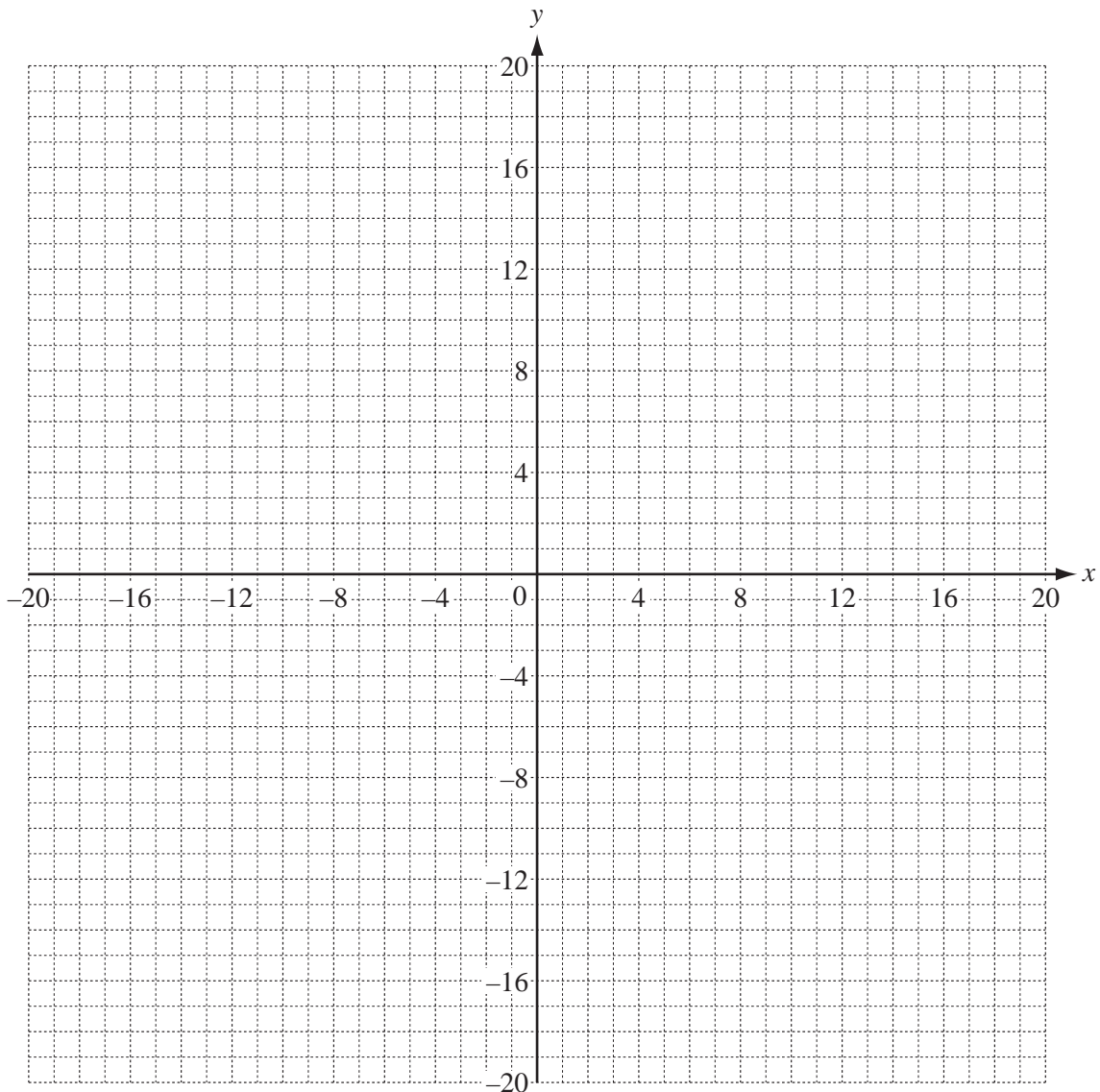


8 (a) Complete the table for the function $y = \frac{18}{x}$, ($x \neq 0$).

x	-18	-9	-6	-3	-2	-1		1	2	3	6	9	18
y				-6	-9	-18		18	9	6			

[3]

(b) On the grid below, draw the graph of $y = \frac{18}{x}$ for $-18 \leq x \leq -1$ and $1 \leq x \leq 18$.



[4]

(c) Write down the order of rotational symmetry of the graph.

Answer(c) [1]

(d) (i) On the grid, draw the graph of $y = x$.

(ii) Write down the co-ordinates of the points of intersection of $y = x$ and $y = \frac{18}{x}$.

Answer(d)(ii) (..... ,) and (..... ,) [2]

(e) On the grid, draw the reflection of $y = x$ in the y -axis. [1]

9 (a) Simplify the following expressions.

(i) $5k + 3p - 2 + p - 2k - 5$

Answer(a)(i) [2]

(ii) $5y^2 - 4x + 5x - 7y^2$

Answer(a)(ii) [2]

(b) Expand the following expressions.

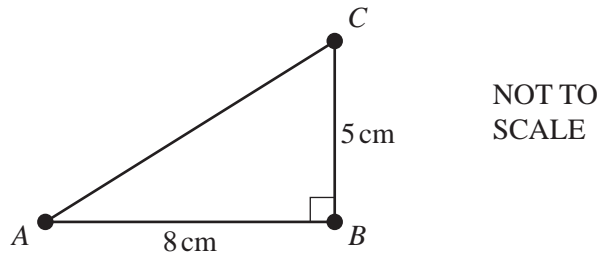
(i) $3(4 + 7g)$

Answer(b)(i) [1]

(ii) $5m(5m^2 - t^2)$

Answer(b)(ii) [2]

- 10 Three bolts at A , B and C join the rods AB , BC and CA to form the right-angled triangle, ABC . Angle $ABC = 90^\circ$, $AB = 8$ cm and $BC = 5$ cm.



(a) Calculate

- (i) the length of the rod AC ,

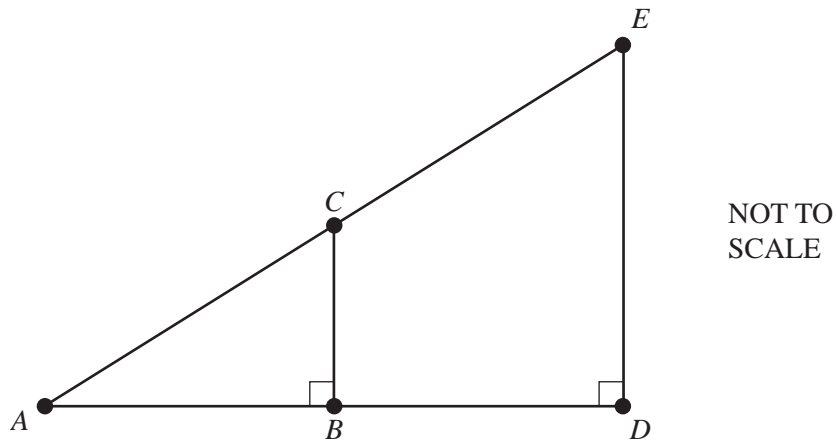
Answer(a)(i) $AC =$ cm [2]

- (ii) angle CAB .

Answer(a)(ii) Angle $CAB =$ [2]

(b) Another right-angled triangle, ADE , is formed by adding rods to triangle ABC .

AC is extended to E and AB is extended to D , with more bolts at D and E . Rods AB and BD are the same length.

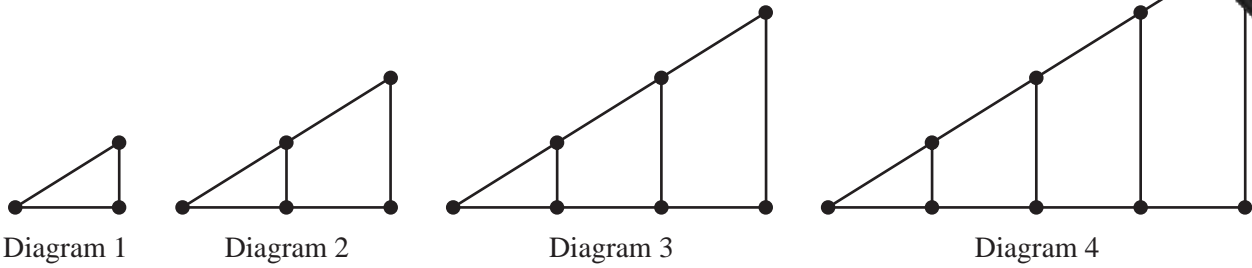


(i) Complete the following statement.

Triangle ADE is to triangle ABC . [1]

(ii) Describe clearly the **single** transformation which maps triangle ABC onto triangle ADE .

Answer(b)(ii) [3]



(c) The pattern of diagrams shown above is continued by adding more rods and bolts.

Complete the table below.

Diagram	1	2	3	4	5
Number of bolts	3	5	7		

[2]

(d) How many bolts are required for

(i) Diagram 10,

Answer(d)(i) [1]

(ii) Diagram n ?

Answer(d)(ii) [2]

(e) The number of bolts in Diagram n is 47.

Find the value of n .

Answer(e) $n =$ [2]

