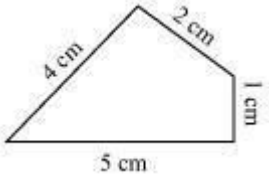
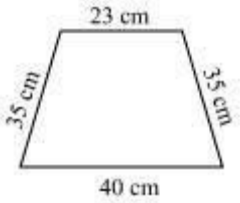
Exercise 10.1

Question 1:

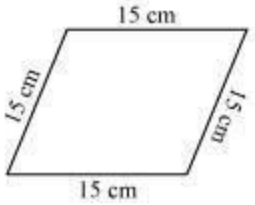
Find the perimeter of each of the following figures:



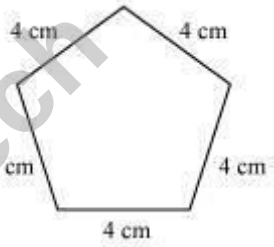
(a)



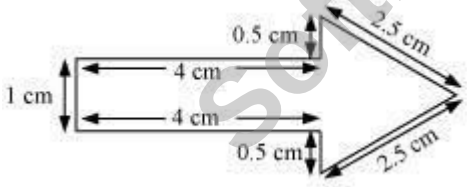
(b)



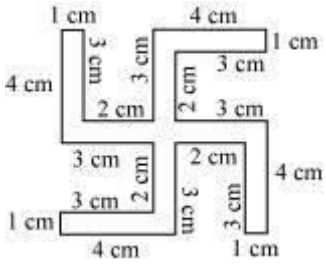
(c)



(d)



(e)



(f)

Answer:

Perimeter of a polygon is equal to the sum of the lengths of all sides of that polygon.

(a) Perimeter = (4 + 2 +1 + 5) cm = 12 cm

(b) Perimeter = (23 + 35 + 40 + 35) cm = 133 cm

(c) Perimeter = (15 + 15 + 15 + 15) cm = 60 cm

(d) Perimeter = (4 + 4 + 4 + 4 + 4) cm = 20 cm

(e) Perimeter = (1 + 4 + 0.5 + 2.5 + 2.5 + 0.5 + 4) cm = 15 cm

(f) Perimeter = (1 + 3 + 2 + 3 + 4 + 1 + 3 + 2 + 3 + 4 + 1 + 3 + 2 + 3 + 4 +

1 + 3 + 2 + 3 + 4) = 52 cm

Question 2:

The lid of a rectangular box of sides 40 cm by 10 cm is sealed all round with tape. What is the length of the tape required?

Answer:

Length (l) of rectangular box = 40 cm

Breadth (b) of rectangular box = 10 cm

Length of tape required = Perimeter of rectangular box

= 2 (l + b) = 2(40 + 10) = 100 cm

Question 3:

A table-top measures 2 m 25 cm by 1 m 50 cm. What is the perimeter of the table-top?

Answer:

Length (l) of table-top = 2 m 25 cm = 2 + 0.25 = 2.25 m

Breadth (b) of table-top = 1 m 50 cm = 1 + 0.50 = 1 .50 m

Perimeter of table-top = 2 (l + b)

= 2 × (2.25 + 1.50)

= 2 × 3.75 = 7.5 m

Question 4:

What is the length of the wooden strip required to frame a photograph of length and breadth 32 cm and 21 cm respectively?

Answer:

Length (l) of photograph = 32 cm

Breadth (b) of photograph = 21 cm

Length of wooden strip required = Perimeter of Photograph

= 2 × (l + b)

= 2 × (32 + 21) = 2 × 53 = 106 cm

Question 5:

A rectangular piece of land measures 0.7 km by 0.5 km. Each side is to be fenced with 4 rows of wires. What is the length of the wire needed?

Answer:

Length (l) of land = 0.7 km

Breadth (b) of land = 0.5 km

Perimeter = 2 × (l + b)

= 2 × (0.7 + 0.5) = 2 × 1.2 = 2.4 km

Length of wire required = 4 × 2.4 = 9.6 km

Question 6:

Find the perimeter of each of the following shapes:

(a) A triangle of sides 3 cm, 4 cm and 5 cm.

(b) An equilateral triangle of side 9 cm.

(c) An isosceles triangle with equal sides 8 cm each and third side 6 cm.

Answer:

(a) Perimeter = (3 + 4 + 5) cm = 12 cm

(b) Perimeter of an equilateral triangle = 3 × Side of triangle

= (3 × 9) cm = 27 cm

(c) Perimeter = (2 × 8) + 6 = 22 cm

Question 7:

Find the perimeter of a triangle with sides measuring 10 cm, 14 cm and 15 cm.

Answer:

Perimeter of triangle = Sum of the lengths of all sides of the triangle

Perimeter = 10 + 14 + 15 = 39 cm

Question 8:

Find the perimeter of a regular hexagon with each side measuring 8 m.

Answer:

Perimeter of regular hexagon = 6 × Side of regular hexagon

Perimeter of regular hexagon = 6 × 8 = 48 m

Question 9:

Find the side of the square whose perimeter is 20 m.

Answer:

Perimeter of square = 4 × Side

20 = 4 × Side

Side = $\frac{20}{4} = 5 \text{ m}$

Question 10:

The perimeter of a regular pentagon is 100 cm. How long is its each side?

Answer:

Perimeter of regular pentagon = 5 × Length of side

100 = 5 × Side

Side = $\frac{100}{5}$ = 20 cm

Question 11:

A piece of string is 30 cm long. What will be the length of each side if the string is used to form:

(a) a square?

(b) an equilateral triangle?

(c) a regular hexagon?

Answer:

(a) Perimeter = 4 × Side

30 = 4 × Side

Side = $\frac{30}{4} = 7.5 \text{ cm}$

(b) Perimeter = 3 × Side

30 = 3 × Side

Side = $\frac{30}{3} = 10 \text{ cm}$

(c) Perimeter = 6 × Side

30 = 6 × Side

Side = $\frac{30}{6} = 5 \text{ cm}$

Question 12:

Two sides of a triangle are 12 cm and 14 cm. The perimeter of the triangle is 36 cm. What is its third side?

Answer:

Perimeter of triangle = Sum of all sides of the triangle

36 = 12 + 14 + Side

36 = 26 + Side

Side = 36 − 26 = 10 cm

Hence, the third side of the triangle is 10 cm.

Question 13:

Find the cost of fencing a square park of side 250 m at the rate of Rs 20 per metre.

Answer:

Length of fence required = Perimeter of the square park

= 4 × Side

= 4 × 250 = 1000 m

Cost for fencing 1 m of square park = Rs 20

Cost for fencing 1000 m of square park = 1000 × 20

= Rs 20000

Question 14:

Find the cost of fencing a rectangular park of length 175 m and breadth 125 m at the rate of Rs 12 per metre.

Answer:

Length (l) of rectangular park = 175 m
Breadth (b) of rectangular park = 125 m

Length of wire required for fencing the park = Perimeter of the park

= 2 × (l + b)

= 2 × (175 + 125)

= 2 × 300

= 600 m

Cost for fencing 1 m of the park = Rs 12

Cost for fencing 600 m of the square park = 600 × 12

= Rs 7200

Question 15:

Sweety runs around a square park of side 75 m. Bulbul runs around a rectangular park with length 60 m and breadth 45 m. Who covers less

distance?

Answer:

Distance covered by Sweety = 4 × Side of square park

= 4 × 75 = 300 m

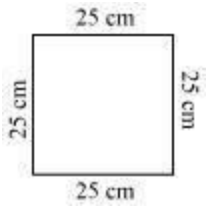
Distance covered by Bulbul = 2 × (60 + 45)

= 2 × 105 = 210 m

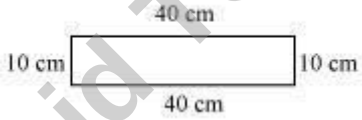
Therefore, Bulbul covers less distance.

Question 16:

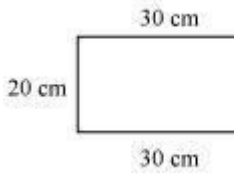
What is the perimeter of each of the following figures? What do you infer from the answers?



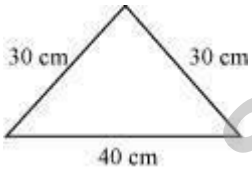
(a)



(b)



(c)



(d)

Answer:

(a) Perimeter of square = 4 × 25 = 100 cm

(b) Perimeter of rectangle = 2 × (10 + 40) = 100 cm

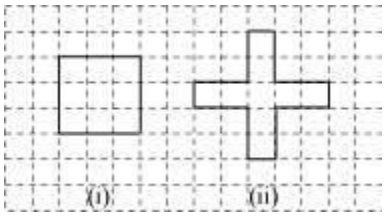
(c) Perimeter of rectangle = 2 × (20 + 30) = 100 cm

(d) Perimeter of triangle = 30 + 30 + 40 = 100 cm

It can be inferred that all the figures have the same perimeter.

Question 17:

Avneet buys 9 square paving slabs, each with a side of $\frac{1}{2}$ m. He lays them in the form of a square.



(a) What is the perimeter of his arrangement [figure (i)]?

(b) Shari does not like his arrangement. She gets him to lay them out like a cross. What is the perimeter of her arrangement [figure (ii)]?

(c) Which has greater perimeter?

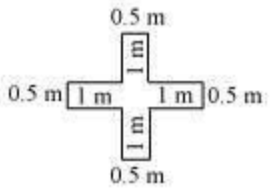
(d) Avneet wonders if there is a way of getting an even greater perimeter. Can you find a way of doing this? (The paving slabs must meet along complete edges i.e. they cannot be broken.)

Answer:

(a) Side of square = $\left(3\times\frac{1}{2}\right)\text{ m}=\frac{3}{2}\text{ m}$

Perimeter of square = $4\times\frac{3}{2}=6\text{ m}$

(b) Perimeter of cross = 0.5 + 1 + 1 + 0.5 + 1 + 1 + 0.5 + 1 + 1 + 0.5 + 1 + 1 = 10 m



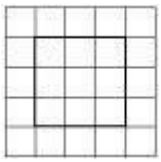
(c) The arrangement in the form of a cross has a greater perimeter.

(d) Arrangements with perimeters greater than 10 m cannot be determined.

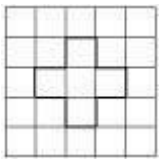
Exercise 10.2

Question 1:

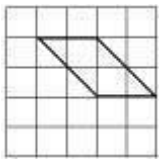
Find the areas of the following figures by counting square:



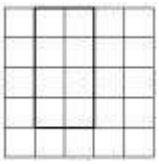
(a)



(b)

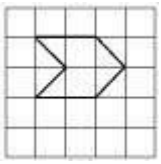


(c)

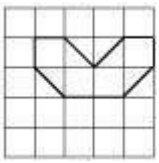


(d)

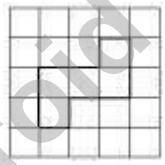
(e)



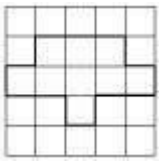
(f)



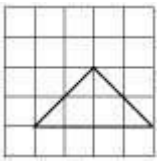
(g)



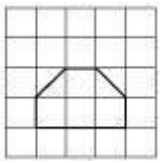
(h)



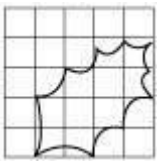
(i)



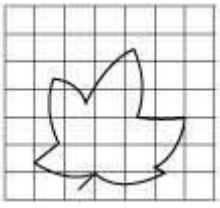
(j)



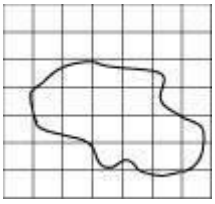
(k)



(l)



(m)



(n)

Answer:

(a) The figure contains 9 fully filled squares only. Therefore, the area of

this figure will be 9 square units.

(b) The figure contains 5 fully filled squares only. Therefore, the area of this figure will be 5 square units.

(c) The figure contains 2 fully filled squares and 4 half-filled squares. Therefore, the area of this figure will be 4 square units.

(d) The figure contains 8 fully filled squares only. Therefore, the area of this figure will be 8 square units.

(e) The figure contains 10 fully filled squares only. Therefore, the area of this figure will be 10 square units.

(f) The figure contains 2 fully filled squares and 4 half-filled squares. Therefore, the area of this figure will be 4 square units.

(g) The figure contains 4 fully filled squares and 4 half-filled squares. Therefore, the area of this figure will be 6 square units.

(h) The figure contains 5 fully filled squares only. Therefore, the area of this figure will be 5 square units.

(i) The figure contains 9 fully filled squares only. Therefore, the area of this figure will be 9 square units.

(j) The figure contains 2 fully filled squares and 4 half-filled squares. Therefore, the area of this figure will be 4 square units.

(k) The figure contains 4 fully filled squares and 2 half-filled squares. Therefore, the area of this figure will be 5 square units.

(l) From the given figure, it can be observed that,

Covered Area	**Number**	**Area estimate (sq units)**
Fully filled squares	2	2
Half filled squares	–	–
More than half – filled squares	6	6
Less than half – filled squares	6	0

Total area = 2 + 6 = 8 square units

(m) From the given figure, it can be observed that,

Covered Area	Number	Area estimate (sq units)
Fully filled squares	5	5
Half-filled squares	–	–
More than half-filled squares	9	9
Less than half-filled squares	12	0

Total area = 5 + 9 = 14 square units

(n) From the given figure, it can be observed that,

Covered Area	Number	Area estimate (sq units)
Fully filled squares	8	8
Half-filled squares	–	–
More than half-filled squares	10	10
Less than half-filled squares	9	0

Total area = 8 + 10 = 18 square units

Exercise 10.3

Question 1:

Find the areas of the rectangles whose sides are:

(a) 3 cm and 4 cm (b) 12 m and 21 m

(c) 2 km and 3 km (d) 2 m and 70 cm

Answer:

It is known that,

Area of rectangle = Length × Breadth

(a) l = 3 cm

b = 4 cm

Area = $l \times b$ = 3 × 4 = 12 cm^2

(b) l = 12 m

b = 21 m

Area = $l \times b$ = 12 × 21 = 252 m^2

(c) l = 2 km

b = 3 km

Area = $l \times b$ = 2 × 3 = 6 km^2

(d) l = 2 m

b = 70 cm = 0.70 m

Area = $l \times b$ = 2 × 0.70 = 1.40 m^2

Question 2:

Find the areas of the squares whose sides are:

(a) 10 cm (b) 14 cm (c) 5 m

Answer:

It is known that,

Area of square = $(Side)^2$

(a) Side = 10 cm

Area = $(10)^2$ =100 cm^2

(b) Side = 14 cm

Area = $(14)^2$ = 196 cm^2

(c) Side = 5 m

Area = $(5)^2$ = 25 m^2

Question 3:

The length and breadth of three rectangles are as given below:

(a) 9 m and 6 m (b) 17 m and 3 m (c) 4 m and 14 m

Which one has the largest area and which one has the smallest?

Answer:

It is known that,

Area of rectangle = Length × Breadth

(a) l = 9 m

b = 6 m

Area = $l \times b = 9 \times 6 = 54\ m^2$

(b) $l = 17$ m

$b = 3$ m

Area = $l \times b = 17 \times 3 = 51\ m^2$

(c) $l = 4$ m

$b = 14$ m

Area = $l \times b = 4 \times 14 = 56\ m^2$

It can be seen that rectangle (c) has the largest area and rectangle (b) has the smallest area.

Question 4:

The area of a rectangular garden 50 m long is 300 sq m. Find the width of the garden.

Answer:

Let the breadth of the rectangular garden be b.

$l = 50$ m

Area = $l \times b = 300$ square m

$50 \times b = 300$

$b = \frac{300}{50} = 6\ m$

Question 5:

What is the cost of tiling a rectangular plot of land 500 m long and 200 m wide at the rate of Rs 8 per hundred sq m?

Answer:

Area of rectangular plot = $500 \times 200 = 100000\ m^2$

Cost of tiling per 100 m^2 = Rs 8

Cost of tiling per 100000 m^2 = $\frac{8}{100} \times 100000$ = Rs 8000

Question 6:

A table-top measures 2 m by 1 m 50 cm. What is its area in square metres?

Answer:

Length (l) = 2 m

Breadth (b) = 1 m 50 cm = $\left(1 + \frac{50}{100}\right)\ m = 1.5\ m$

Area = $l \times b = 2 \times 1.5 = 3\ m^2$

Question 7:

A room is 4 m long and 3 m 50 cm wide. How many square metres of carpet is needed to cover the floor of the room?

Answer:

Length (l) = 4 m

Breadth (b) = 3 m 50 cm = 3.5 m

Area = $l \times b = 4 \times 3.5 = 14$ m^2

Question 8:

A floor is 5 m long and 4 m wide. A square carpet of sides 3 m is laid on the floor. Find the area of the floor that is not carpeted.

Answer:

Length (l) = 5 m

Breadth (b) = 4 m

Area of floor = $l \times b = 5 \times 4 = 20$ m^2

Area covered by the carpet = $(\text{Side})^2 = (3)^2 = 9$ m^2

Area not covered by the carpet = $20 - 9 = 11$ m^2

Question 9:

Five square flower beds each of sides 1 m are dug on a piece of land 5 m long and 4 m wide. What is the area of the remaining part of the land?

Answer:

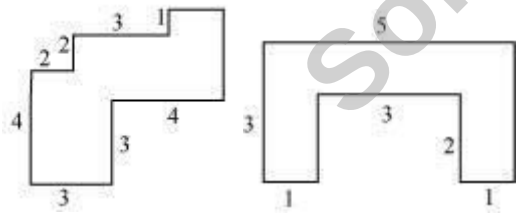
Area of the land = $5 \times 4 = 20$ m^2

Area occupied by 5 flower beds = $5 \times (\text{Side})^2 = 5 \times (1)^2 = 5$ m^2

∴ Area of the remaining part = $20 - 5 = 15$ m^2

Question 10:

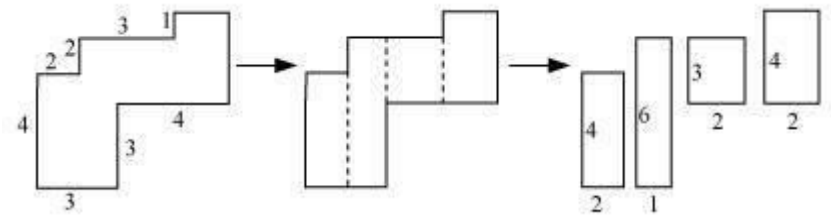
By splitting the following figures into rectangles, find their areas (The measures are given in centimetres).



(a) (b)

Answer:

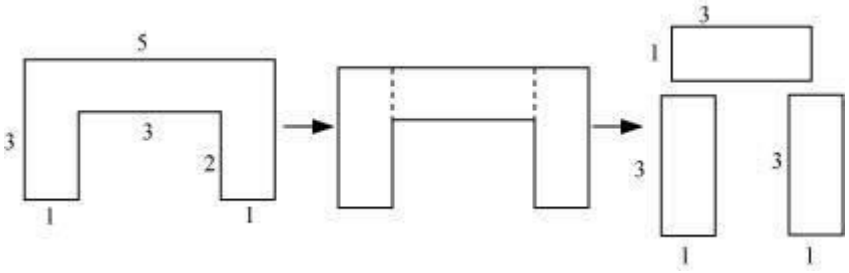
(a) The given figure can be broken into rectangles as follows.



Area of 1st rectangle = $4 \times 2 = 8$ cm^2

Area of 2nd rectangle = 6 × 1 = 6 cm^2
Area of 3rd rectangle = 3 × 2 = 6 cm^2
Area of 4th rectangle = 4 × 2 = 8 cm^2
Total area of the complete figure = 8 + 6 + 6 + 8 = 28 cm^2

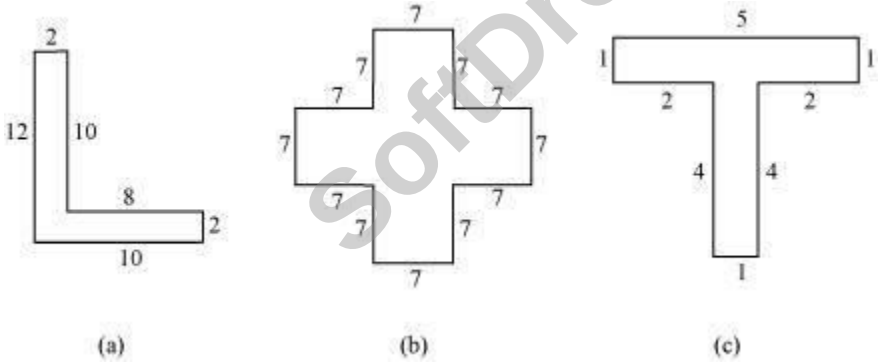
(b) The given figure can be broken into rectangles as follows.



Area of 1st rectangle = 3 × 1 = 3 cm^2
Area of 2nd rectangle = 3 × 1 = 3 cm^2
Area of 3rd rectangle = 3 × 1 = 3 cm^2
Total area of the complete figure = 3 + 3 + 3 = 9 cm^2

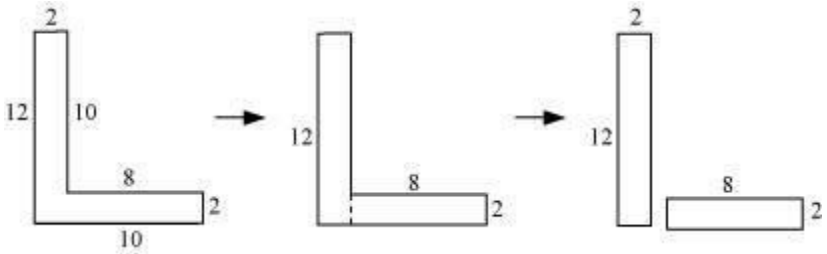
Question 11:

Split the following shapes into rectangles and find their areas. (The measures are given in centimetres)



Answer:

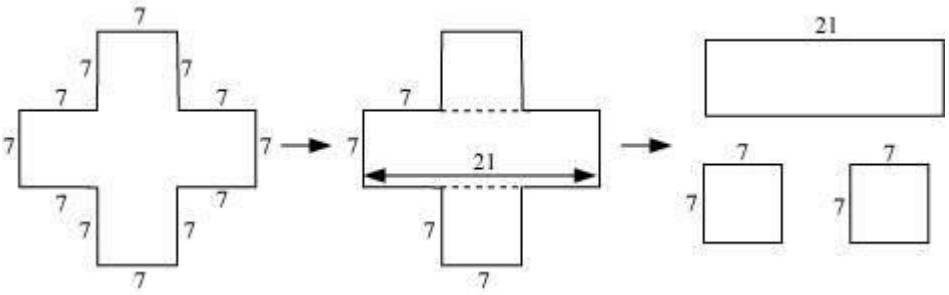
(a) The given figure can be broken into rectangles as follows.



Area of 1st rectangle = 12 × 2 = 24 cm^2
Area of 2nd rectangle = 8 × 2 = 16 cm^2

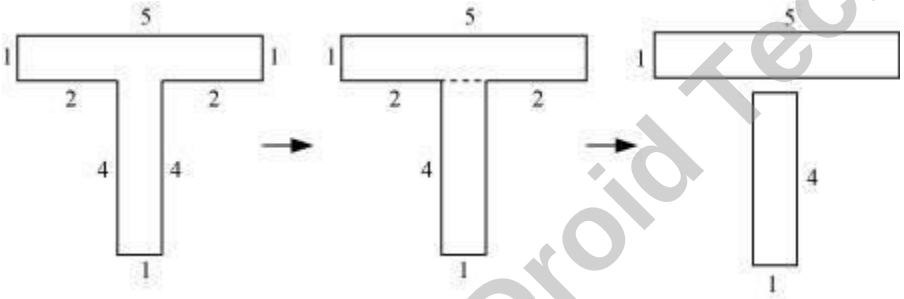
Total area of the complete figure = 24 + 16 = 40 cm^2

(b) The given figure can be broken into rectangles as follows.



Area of 1st rectangle = 21 × 7 = 147 cm^2
Area of 2nd square = 7 × 7 = 49 cm^2
Area of 3rd square = 7 × 7 = 49 cm^2
Total area of the complete figure = 147 + 49 + 49 = 245 cm^2

(c) The given figure can be broken into rectangles as follows.



Area of 1st rectangle = 5 × 1 = 5 cm^2
Area of 2nd rectangle = 4 × 1 = 4 cm^2
Total area of the complete figure = 5 + 4 = 9 cm^2

Question 12:

How many tiles whose length and breadth are 12 cm and 5 cm respectively will be needed to fit in a rectangular region whose length and breadth are respectively:

(a) 100 cm and 144 cm

(b) 70 cm and 36 cm

Answer:

(a) Total area of the region = 100 × 144 = 14400 cm^2
Area of one tile = 12 × 5 = 60 cm^2

Number of tiles required = $\frac{14400}{60} = 240$

Therefore, 240 tiles are required.

(b) Total area of the region = 70 × 36 = 2520 cm^2

Area of one tile = 60 cm^2

Number of tiles required = $\frac{2520}{60} = 42$

Therefore, 42 tiles are required.