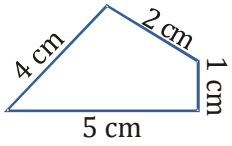
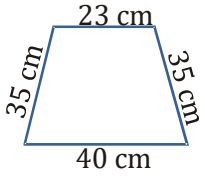
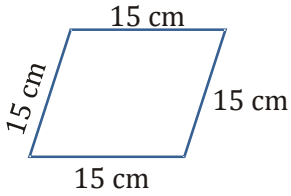
NCERT QUESTIONS WITH SOLUTIONS

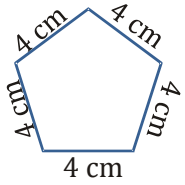
EXERCISE : 10.1

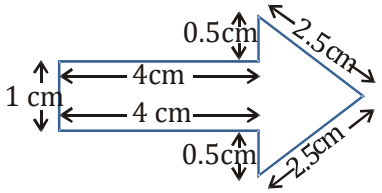
1. Find the perimeter of each of the following figures :

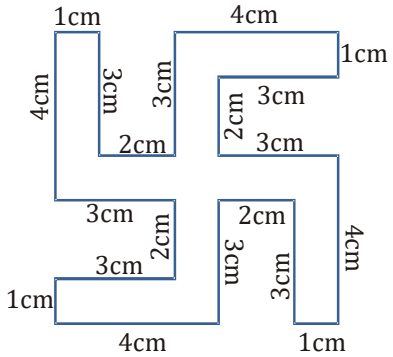
(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

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

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

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

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

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

(f) Perimeter = 1 cm + 3 cm + 2 cm + 3 cm + 4 cm + 1 cm + 3 cm + 2 cm + 3 cm + 4 cm + 1 cm + 3 cm + 2 cm + 3 cm +4 cm + 1 cm + 3 cm+ 2 cm + 3 cm + 4 cm
= 52 cm

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?

Sol. Length of the tape required
= Perimeter of the rectangular box
= 2 × (Length + Breadth) = 2 × (40 + 10)
= 2 × (50) = 100 cm = 1 m

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

Sol. Perimeter of the table-top
= 2 × (Length + Breadth)
= 2 × (2 m 25 cm + 1 m 50 cm)
= 2 × (2.25 m + 1.50 m)
= 2 × (3.75 m) = 7.5 m

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

Sol. Length of the wooden strip required
= 2 × (Length + Breadth)
= 2 × (32 cm + 21 cm) [∵ 1m = 100 cm]
= 2 × (53 cm)
= 106 cm = 1.06 m

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?

Sol. Perimeter of the rectangular piece of land.
= 2 × (Length + Breadth)
= 2 × (0.7 km + 0.5 km)
= 2 × (1.2 km) = 2.4 km
Length of the wire needed
= 4 × Perimeter of the rectangle
= 4 × (2.4 km) = 9.6 km

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.

Sol. (a) Perimeter of the triangle
= 3 cm + 4 cm + 5 cm = 12 cm
(b) Perimeter of the equilateral triangle
= 3 × Length of a side
= 3 × (9 cm) = 27 cm
(c) Perimeter of the isosceles triangle
= 8 cm + 8 cm + 6 cm = 22 cm

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

Sol. Perimeter of a triangle = Sum of a length of its three sides = 10 cm + 14 cm + 15 cm = 39 cm

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

Sol. Perimeter of a regular hexagon
= 6 × Length of a side
= 6 × 8 = 48 m

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

Sol. Perimeter of a square
= 4 × Length of a side

$$\Rightarrow \text{Length of a side} = \frac{\text{Perimeter of a square}}{4}$$

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

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

Sol. Perimeter of a regular pentagon
= 5 × Length of a side
⇒ Length of one side

$$= \frac{\text{Perimeter of a regular pentagon}}{5}$$

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

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?

Sol. (a) Perimeter of a square
= 4 × Length of a side

$$\Rightarrow \text{Length of a side} = \frac{\text{Perimeter of a square}}{4}$$

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

(b) Perimeter of an equilateral triangle

= 3 × Length of a side

⇒ Length of a side

$= \frac{\text{Perimeter of an equilateral triangle}}{3}$

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

(c) Perimeter of a regular hexagon

= 6 × Length of side

⇒ Length of a side

$= \frac{\text{Perimeter of a regular hexagon}}{6}$

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

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?

Sol. Perimeter of a triangle = Sum of the lengths of its three sides

⇒ 36 cm = 12 cm + 14 cm + Length of the third side

⇒ 36 cm = 26 cm + Length of the third side

⇒ Length of the third side = 36 cm – 26 cm

= 10 cm

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

Sol. Perimeter of the square park = 4 × Length of a side = 4 × (250 m) = 1000 m

∴ Cost of fencing the square park at the rate of ₹ 20 per metre = 1000 × 20

= ₹ 20,000

14. Find the cost of fencing a rectangular park of length 175 m and breadth 125 m at the rate of ₹ 12 per meter.

Sol. Perimeter of the rectangular park

= 2 × (Length + Breadth)

= 2 × (175 m + 125 m)

= 2 × (300 m) = 600 m

∴ Cost of fencing a rectangular park

= 600 × 12 = ₹7200

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?

Sol. Perimeter of the square park = 4 × Length of a side = 4 × (75 m) = 300 m

Perimeter of the rectangular park

= 2 × (Length + Breadth)

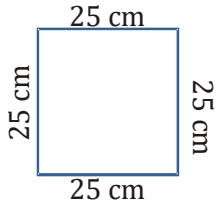
= 2 × (60 m + 45 m)

= 2 × (105 m) = 210 m

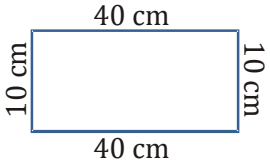
Since, the perimeter of the rectangular park is less than the perimeter of the square park, therefore, Bulbul covers less distance.

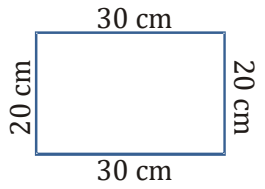
16. What is the perimeter of each of the following figures? What do you infer from the answers?

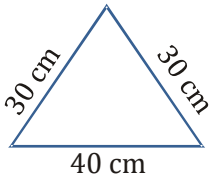
(a)



(b)



(c) 

(d) 

Sol. (a) Perimeter = Sum of the length of all the sides

=25 cm+25 cm + 25 cm + 25 cm = 100 cm

(b) Perimeter = Sum of the length of all the sides

= 40 cm + 10 cm + 40 cm + 10 cm

= 100 cm

(c) Perimeter = Sum of the lengths of all the sides

= 30 cm + 20 cm + 30 cm + 20 cm

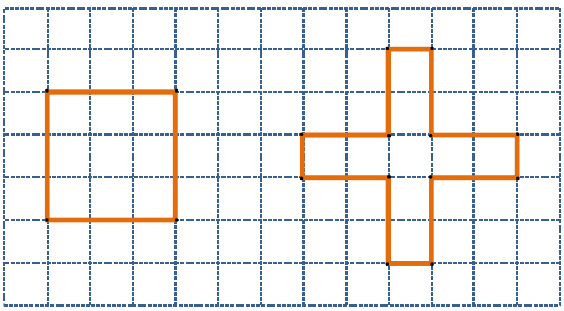
= 100 cm

(d) Perimeter = Sum of the length of all the sides

= 30 cm + 30 cm + 40 cm = 100 cm

Inference from the answers : All the figures have same perimeter.

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.



(i) (ii)

(a) What is the perimeter of his arrangement (Fig. 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 (Fig. 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.)

Sol. (a) Perimeter of his arrangement

= 4 × Length of one side

$= 4 \times \left(\frac{1}{2}m + \frac{1}{2}m + \frac{1}{2}m\right)$

$= 4 \times \left(\frac{3}{2}m\right) = 6\ m$

(b) Perimeter of her arrangement

= Sum of the length of all the sides

$= \frac{1}{2}m + \left(\frac{1}{2}m + \frac{1}{2}m\right) + \left(\frac{1}{2}m + \frac{1}{2}m\right) + \frac{1}{2}m$

$+ \left(\frac{1}{2}m + \frac{1}{2}m\right) + \left(\frac{1}{2}m + \frac{1}{2}m\right) +$

$\frac{1}{2}m + \left(\frac{1}{2}m + \frac{1}{2}m\right) + \left(\frac{1}{2}m + \frac{1}{2}m\right) + \frac{1}{2}m$

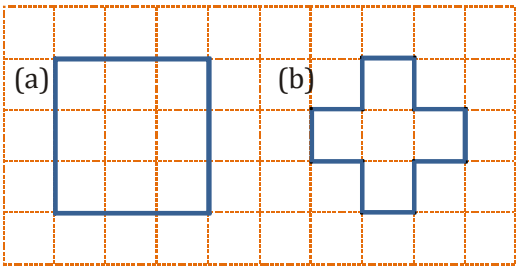
$+ \left(\frac{1}{2}m + \frac{1}{2}m\right) + \left(\frac{1}{2}m + \frac{1}{2}m\right) = 10\ m$

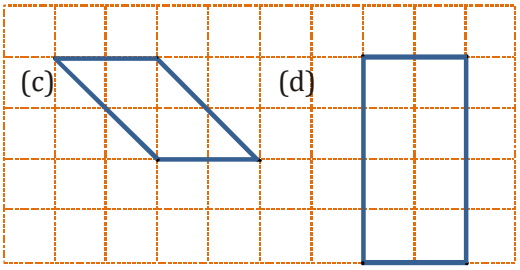
(c) Cross (fig. ii) has greater perimeter.

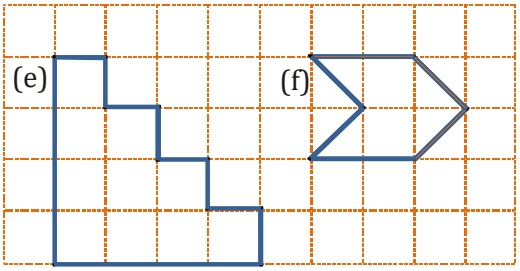
(d) Arrangements for a greater perimeter cannot be determined.

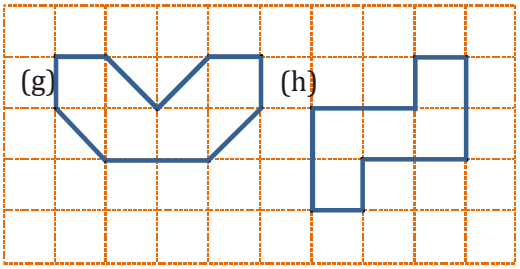
EXERCISE : 10.2

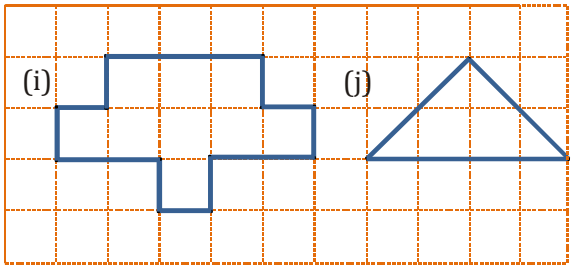
1. Find the areas of the following figures :

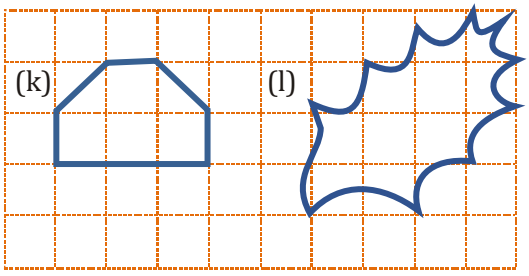


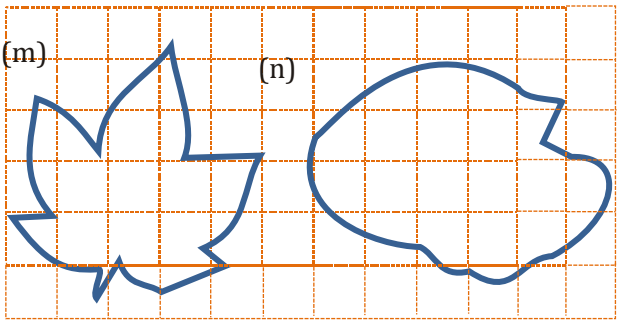












Sol. (a)

	Cover	Number	Area Estimate
(i)	Full-filled squares	9	9 Sq. units
(ii)	Half-filled squares	0	0 Sq. unit
(iii)	More than half-filled squares	0	0 Sq. unit
(iv)	Less than half filled squares	0	0 Sq. unit

$\therefore$ Total area of the figure = 9 sq. units

(b)

	Cover	Number	Area Estimate
(i)	Full-filled squares	5	5 Sq. units
(ii)	Half-filled squares	0	0 Sq. unit
(iii)	More than half-filled squares	0	0 Sq. unit
(iv)	Less than half filled squares	0	0 Sq. unit

$\therefore$ Total area of the figure = 5 sq. units

(c) Full-filled squares = 2

Half-filled squares = 4

$\therefore$ Total area of figure = 2 sq. units + $\frac{1}{2}\times 4$

= 4 sq. units

(d) Full-filled squares = 8

$\therefore$ Total area = Area covered by full-filled squares

= 8 × 1 sq. unit = 8 sq. units

(e) Full-filled squares = 10

$\therefore$ Total area = Area covered by full squares

= 10 × 1 sq. unit = 10 sq. units

(f) Full-filled squares = 2

Half-filled squares = 4

Area covered by full squares

= 2 × 1 sq. unit = 2 sq. units

Area covered by half squares

= $4 \times \frac{1}{2}$ sq. unit = 2 sq. units

$\therefore$ Total area = 2 sq. units + 2 sq. units

= 4 sq. units

(g) Full-filled squares = 4

Half-filled squares = 4

Area covered by full squares

= 4 × 1 sq. unit = 4 sq. units

Area covered by half squares

= 4 × sq. unit = 2 sq. units

$\therefore$ Total area = 4 sq. units + 2 sq. units

= 6 sq. units

(h) Full-filled squares = 5

$\therefore$ Total area = Area covered by full squares

= 5 × 1 sq. unit = 5 sq. units

(i) Full-filled squares = 9

$\therefore$ Total area = Area covered by full squares

= 9 × 1 sq. unit = 9 sq. units

(j) Full-filled squares = 2

Half-filled squares = 4

Area covered by full squares

= 2 × 1 sq. unit = 2 sq. units

Area covered by half squares

= $4 \times \frac{1}{2}$ sq. unit = 2 sq. units

$\therefore$ Total area = 2 sq. units + 2 sq. units

= 4 sq. units

(k) Full-filled squares = 4

Half-filled squares = 2

Area covered by full squares

= 4 × 1 sq. unit = 4 sq. units

Area covered by half squares

= $2 \times \frac{1}{2}$ sq. unit = 1 sq. unit

$\therefore$ Total area = 4 sq. units + 1 sq. unit

= 5 sq. units

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

Covered Area	Number	Area estimate (sq. units)
Full-filled squares	2	2
Half-filled squares	0	0
More than Half-filled squares	6	6
Less than Half-filled squares	6	0

∴ Total Area = Number of complete squares + $\frac{1}{2}$ (Number of half squares) + Number of more than half-filled squares + Number of less than half-filled squares

∴ Total Area

=2 sq. units + $\frac{1}{2}$ × 0 sq. units + 6 sq. units + 6 × 0 sq. units

= 2 + 0 + 6 = 8 sq. units

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

Covered Area	Number	Area estimate (sq. units)
Full-filled squares	5	5
Half-filled squares	0	0
More than Half-filled squares	9	9
Less than Half-filled squares	12	0

∴ Total Area = Number of complete squares + $\frac{1}{2}$ (Number of half squares) + Number of more than half-filled squares Number of less than half-filled squares

∴ Total Area = 5 sq. units+ $\frac{1}{2}$ × 0 sq. units + 9 sq. units + 12 0 sq. units

= 5 + 0 + 9 = 14 sq. units

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

Covered Area	Number	Area estimate (sq. units)
Full-filled squares	8	8
Half-filled squares	0	0
More than Half filled squares	10	10
Less than Half-filled squares	9	0

∴ Total Area = Number of complete squares + $\frac{1}{2}$ (Number of half squares) + Number of more than half-filled squares + Number of less than half-filled squares

∴ Total Area = 8 sq. units + $\frac{1}{2}$ × 0 sq. units + 10 sq. units + 9 × 0 units

= 8 + 0 + 10 = 18 sq. units

EXERCISE : 10.3

1. Find the area 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

Sol. (a) Area of the rectangle = Length × Breadth

= 3 × 4 sq. cm = 12 sq. cm

(b) Area of the rectangle = Length × Breadth = 12 m × 21 m = 252 sq. m

(c) Area of the rectangle = Length × Breadth = 2 km × 3 km = 6 sq. km

(d) Area of the rectangle = Length × Breadth

2m = 2 × 100 cm = 200 cm

Area of the rectangle = Length × Breadth

= 200 × 70 sq. cm = 14000 sq. cm

2. Find the areas of the squares whose sides are :
(a) 10 cm (b) 14 cm (c) 5 m

Sol. (a) Area of the square = Side × Side
= 10 cm × 10 cm = 100 sq. cm
(b) Area of the square = Side × Side
= 14 cm × 14 cm = 196 sq. cm
(c) Area of the square = Side × Side
= 5 m × 5 m = 25 sq. m

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?

Sol. (a) Area of the rectangle = Length × Breadth
= 9 m × 6 m = 54 sq. m
(b) Length of the rectangle = Length × Breadth = 17 m × 3 m = 51 sq. m
(c) Length of rectangle = Length × Breadth
= 4 m × 14 m = 56 sq. m
The rectangle (c) has the largest area, and the rectangle (b) has the smallest area.

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

Sol. Area of the rectangular garden = 300 sq. m
Length of the rectangular garden = 50 m
∴ Width of the rectangular garden = $\frac{\text{Area of the rectangular garden}}{\text{Length of the rectangular garden}}$
= $\frac{300}{50}$ m = 6 m
Hence, the width of the garden is 6 meters

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

Sol. Area of the rectangular piece of land = Length × Breadth
= 500 m × 200 m = 100000 sq. m
∵ Cost of tiling 100 sq. m = ₹ 8
∴ Cost of tiling 1 sq. m = ₹ $\frac{8}{100}$
∴ Cost of tiling 100000 sq. m = ₹ $\frac{8}{100}$ × 100000
= ₹ 8000.

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

Sol. Length of the table-top = 2 m
Breadth of the table-top = 1 m 50 cm = 1.50 m
∴ Area of the table-top = Length × Breadth
= 2 m × 1.50 m = 3.0 sq. m

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?

Sol. Length of the room = 4 m
Breadth of room = 3 m 50 cm = 3.50 m
∴ Area of the room = Length × Breadth
= 4 × 3.5 sq. m = 14.0 sq. m
Hence, 14.0 square metres of carpet is needed to cover the floor of the room.

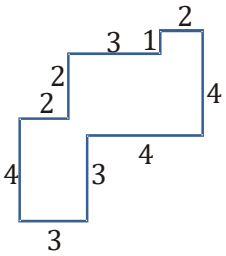
8. A floor is 5 m long and 4 m wide. A square carpet of sides 3 m is laid on the floor. Find the area of the floor that is not carpeted.

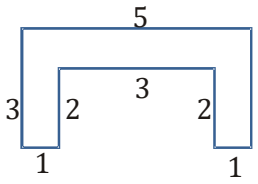
Sol. Length of the floor = 5 m
Breadth of the floor = 4 m
∴ Area of the floor = Length × Breadth
= 5 m × 4 m = 20 sq. m
Area of the square carpet = Side × Side
= 3 m × 3 m = 9 sq. m
∴ Area of the floor that is not carpeted = 20 sq. m – 9 sq. m = 11 sq. m

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 land?

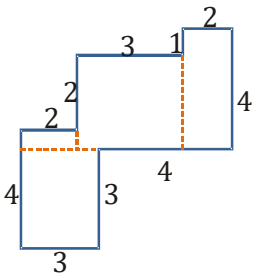
Sol. Area of square flower bed = Side × Side
= 1 m × 1 m = 1 sq. m
∴ Area of 5 square flower beds = 5 × 1 sq. m
= 5 sq. m
Length of the piece of land = 5 m
Breadth of the piece of land = 4 m
∴ Area of the piece of land = Length × Breadth
= 5 m × 4 m = 20 sq. m
∴ Area of the remaining part of land
= 20 sq. m – 5 sq. m = 15 sq. m.

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

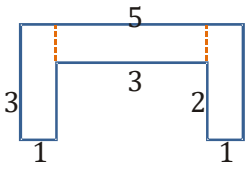
(a) 

(b) 

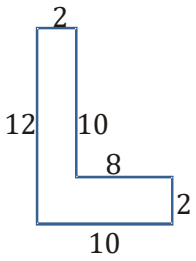
Sol. (a) Area of the figure = (3 × 3 + 1 × 2 + 3 × 3 + 4 × 2) sq. cm
= (9 + 2 + 9 + 8)sq. cm = 28 sq. cm

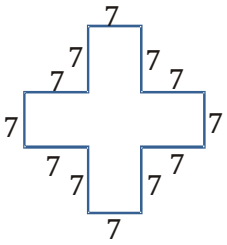


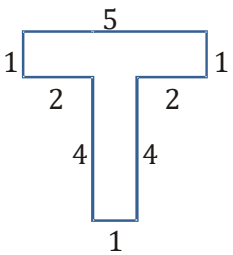
(b) Area of the figure= (3×1 + 3×1 + 3×1)sq. cm
= (3 + 3 + 3) sq. cm = 9 sq. cm



11. Split the following shapes into rectangle and find the area of each (The measures are given in centimetres).

(a) 

(b) 

(c) 

Sol. (a) Area of the shape = (8 × 2 + 12 × 2) sq. cm
= (16 + 24) sq. cm = 40 sq. cm

(b) Area of the shape= (7×7 + 7×7 + 7 × 7 + 7 × 7 + 7 × 7) sq. cm
= (49 + 49 + 49 + 49 + 49) sq. cm
= 245 sq. cm

(c) Area of the shape= (5×1 + 4 × 1) sq. cm
= (5 + 4) sq. cm = 9 sq. cm

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?

Sol. (a) Length of the region = 100 cm
Breadth of the region = 144 cm
∴ Area of the region
= Length × Breadth
= 100 cm × 144 cm = 14400 sq. cm
Length of tile = 12 cm
Breadth of tile = 5 cm
∴ Area of tile = Length × Breadth
= 12 × 5 sq. cm = 60 sq. cm
∴ Number of tiles needed to fit the region

$$= \frac{\text{Area of the region}}{\text{Area of a tile}}$$

$$= \frac{14400}{60} = 240 \text{ tiles}$$

(b) Length of the region = 70 cm
Breadth of the region = 36 cm
∴ Area of the rectangular region
= 70 × 36 sq. cm
= 2520 sq. cm
Area of a tile = 60 sq. cm
∴ Number of tiles needed to fit the region

$$= \frac{\text{Area of the region}}{\text{Area of a tile}}$$

$$= \frac{2520}{60} = 42 \text{ tiles}$$