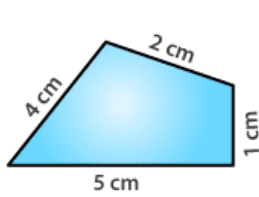


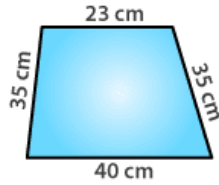
CHAPTER 10: MENSURATION
CLASS 6 NCERT SOLUTION

Exercise 10.1 Page no: 212

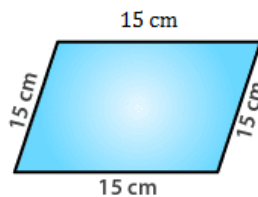
1. Find the perimeter of each of the following figures:



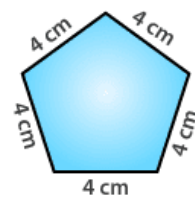
(a)



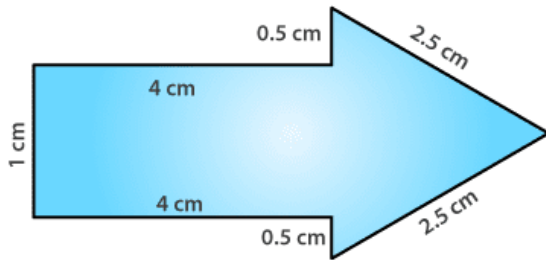
(b)



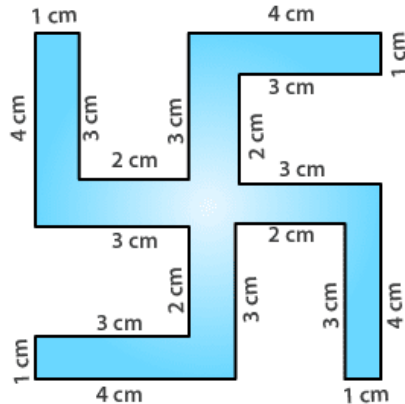
(c)



(d)



(e)



(f)

Solutions:

(a) Perimeter = Sum of all the sides

$$= 1 + 2 + 4 + 5$$

$$= 12 \text{ cm}$$

(b) Perimeter = Sum of all the sides

$$= 23 + 35 + 35 + 40$$

$$= 133 \text{ cm}$$

(c) Perimeter = Sum of all the sides

$$= 15 + 15 + 15 + 15$$

$$= 60 \text{ cm}$$

(d) Perimeter = Sum of all the sides

$$= 4 + 4 + 4 + 4 + 4$$

$$= 20 \text{ cm}$$

(e) Perimeter = Sum of all the sides

$$= 1 + 4 + 0.5 + 2.5 + 2.5 + 0.5 + 4$$

$$= 15 \text{ cm}$$

(f) Perimeter = Sum of all the sides

$$= 4 + 1 + 3 + 2 + 3 + 4 + 1 + 3 + 2 + 3 + 4 + 1 + 3 + 2 + 3 + 4 + 1 + 3 + 2 + 3$$

$$= 52 \text{ cm}$$

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

Solutions:

Length of required tape = Perimeter of rectangle

$$= 2 (\text{Length} + \text{Breadth})$$

$$= 2 (40 + 10)$$

$$= 2 (50)$$

$$= 100 \text{ cm}$$

∴ Required length of tape is 100 cm

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

Solutions:

Length of table top = 2 m 25 cm = 2.25 m

Breadth of table top = 1 m 50 cm = 1.50 m

Perimeter of table top = 2 (Length + Breadth)

$$= 2 (2.25 + 1.50)$$

$$= 2 (3.75)$$

$$= 2 \times 3.75$$

$$= 7.5 \text{ m}$$

∴ The perimeter of the table top is 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?

Solutions:

Required length of wooden strip = Perimeter of photograph

$$= 2 (\text{Length} + \text{Breadth})$$

$$= 2 (32 + 21)$$

$$= 2 (53)$$

$$= 2 \times 53$$

$$= 106 \text{ cm}$$

∴ Required length of the wooden strip is 106 cm

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?

Solutions:

Perimeter of the field = $2 (\text{Length} + \text{Breadth})$

$$= 2 (0.7 + 0.5)$$

$$= 2 (1.2)$$

$$= 2 \times 1.2$$

$$= 2.4 \text{ km}$$

Each side is to be fenced with 4 rows = 4×2.4

$$= 9.6 \text{ km}$$

∴ Total length of the required wire is 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.

Solutions:

(a) Perimeter of triangle = $3 + 4 + 5$

= 12 cm

(b) Perimeter of an equilateral triangle = $3 \times \text{side}$

= 3×9

= 27 cm

(c) Perimeter of isosceles triangle = $8 + 8 + 6$

= 22 cm

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

Solutions:

Perimeter of triangle = $10 + 14 + 15$

= 39 cm

∴ The perimeter of triangle is 39 cm

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

Solutions:

Perimeter of hexagon = 6×8

= 48 m

∴ Perimeter of regular hexagon is 48 m

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

Solutions:

Perimeter of square = $4 \times \text{side}$

$20 = 4 \times \text{side}$

Side = $20 / 4$

Side = 5 m

∴ The side of the square is 5 m

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

Solutions:

Perimeter of regular pentagon = 100 cm

$$5 \times \text{side} = 100 \text{ cm}$$

$$\text{Side} = 100 / 5$$

$$\text{Side} = 20 \text{ cm}$$

∴ Side of the pentagon is 20 cm

11. A piece of strings 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?

Solutions:

(a) Perimeter of square = 30 cm

$$4 \times \text{side} = 30$$

$$\text{Side} = 30 / 4$$

$$\text{Side} = 7.5 \text{ cm}$$

(b) Perimeter of an equilateral triangle = 30 cm

$$3 \times \text{side} = 30$$

$$\text{Side} = 30 / 3$$

$$\text{Side} = 10 \text{ cm}$$

(c) Perimeter of a regular hexagon = 30 cm

$$6 \times \text{side} = 30$$

$$\text{Side} = 30 / 6$$

$$\text{Side} = 5 \text{ cm}$$

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?

Solutions:

Let x cm be the third side

$$\text{Perimeter of triangle} = 36 \text{ cm}$$

$$12 + 14 + x = 36$$

$$26 + x = 36$$

$$x = 36 - 26$$

$$x = 10 \text{ cm}$$

∴ The third side is 10 cm

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

Solutions:

Side of square = 250 m

Perimeter of square = $4 \times \text{side}$

$$= 4 \times 250$$

$$= 1000 \text{ m}$$

Cost of fencing = ₹ 20 per m

Cost of fencing for 1000 m = ₹ 20×1000

$$= ₹ 20,000$$

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

Solutions:

Length = 175 cm

Breadth = 125 m

Perimeter of rectangular park = $2 (\text{Length} + \text{Breadth})$

$$= 2 (175 + 125)$$

$$= 2 (300)$$

$$= 2 \times 300$$

$$= 600 \text{ m}$$

Cost of fencing = 12×600

$$= 7200$$

∴ Cost of fencing is ₹ 7,200

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?

Solutions:

Perimeter of square = $4 \times \text{side}$

$$= 4 \times 75$$

$$= 300 \text{ m}$$

\therefore Distance covered by Sweety is 300 m

Perimeter of rectangular park = $2 (\text{Length} + \text{Breadth})$

$$= 2 (60 + 45)$$

$$= 2 (105)$$

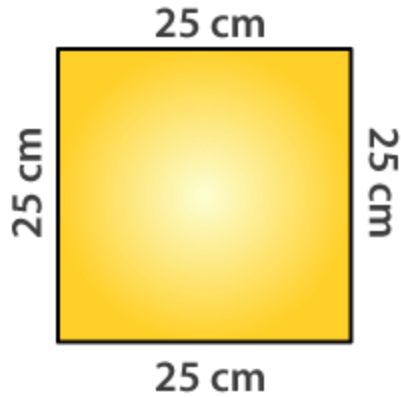
$$= 2 \times 105$$

$$= 210 \text{ m}$$

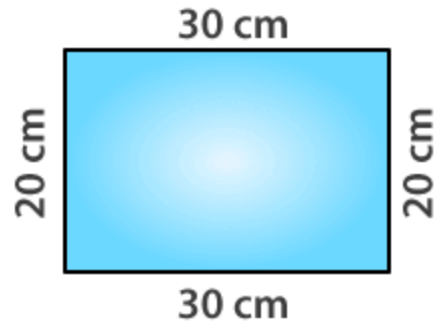
\therefore Distance covered by Bulbul is 210 m

Hence, Bulbul covers less distance than Sweety.

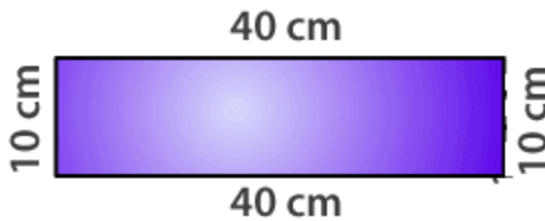
**16. What is the perimeter of each of the each of the following figures?
What do you infer from the the answers?**



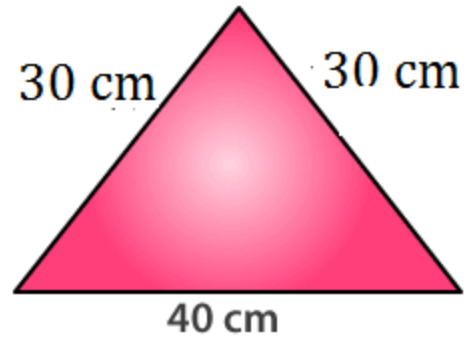
(a)



(c)



(b)



(d)

Solutions:

(a) Perimeter of square = $4 \times \text{side}$

$$= 4 \times 25$$

$$= 100 \text{ cm}$$

(b) Perimeter of rectangle = $2 (40 + 10)$

$$= 2 \times 50$$

$$= 100 \text{ cm}$$

(c) Perimeter of rectangle = $2 (\text{Length} + \text{Breadth})$

$$= 2 (30 + 20)$$

$$= 2 (50)$$

$$= 2 \times 50$$

= 100 cm

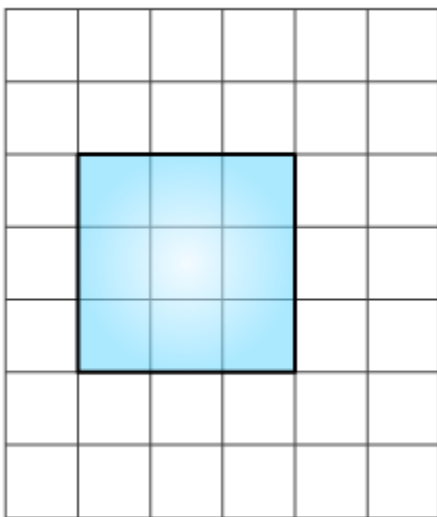
(d) Perimeter of triangle = $30 + 30 + 40$

= 100 cm

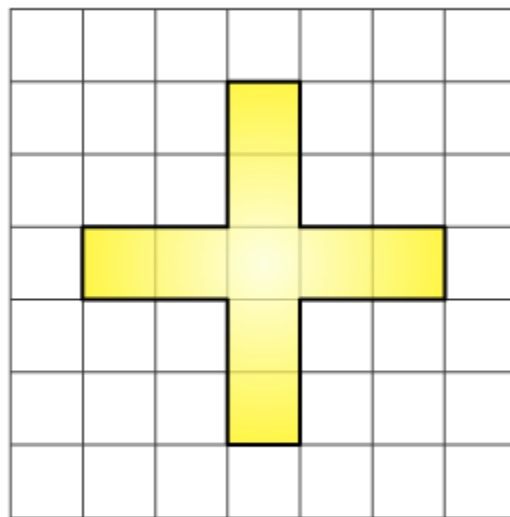
All the figures have same perimeter.

17. Avneet buys 9 square paving slabs, each with a side of $1/2$ m. He lays them in the form of a square.

(a) What is the perimeter of his arrangement [fig 10.7(i)]?



(i)



(ii)

(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 10.7 (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.)

Solutions:

(a) Side of square = $3 \times$ side

= $3 \times 1/2$

= $3/2$ m

$$\text{Perimeter of Square} = 4 \times 3 / 2$$

$$= 2 \times 3$$

$$= 6 \text{ m}$$

$$\text{(b) Perimeter} = 0.5 + 1 + 1 + 0.5 + 1 + 1 + 0.5 + 1 + 1 + 0.5 + 1 + 1$$

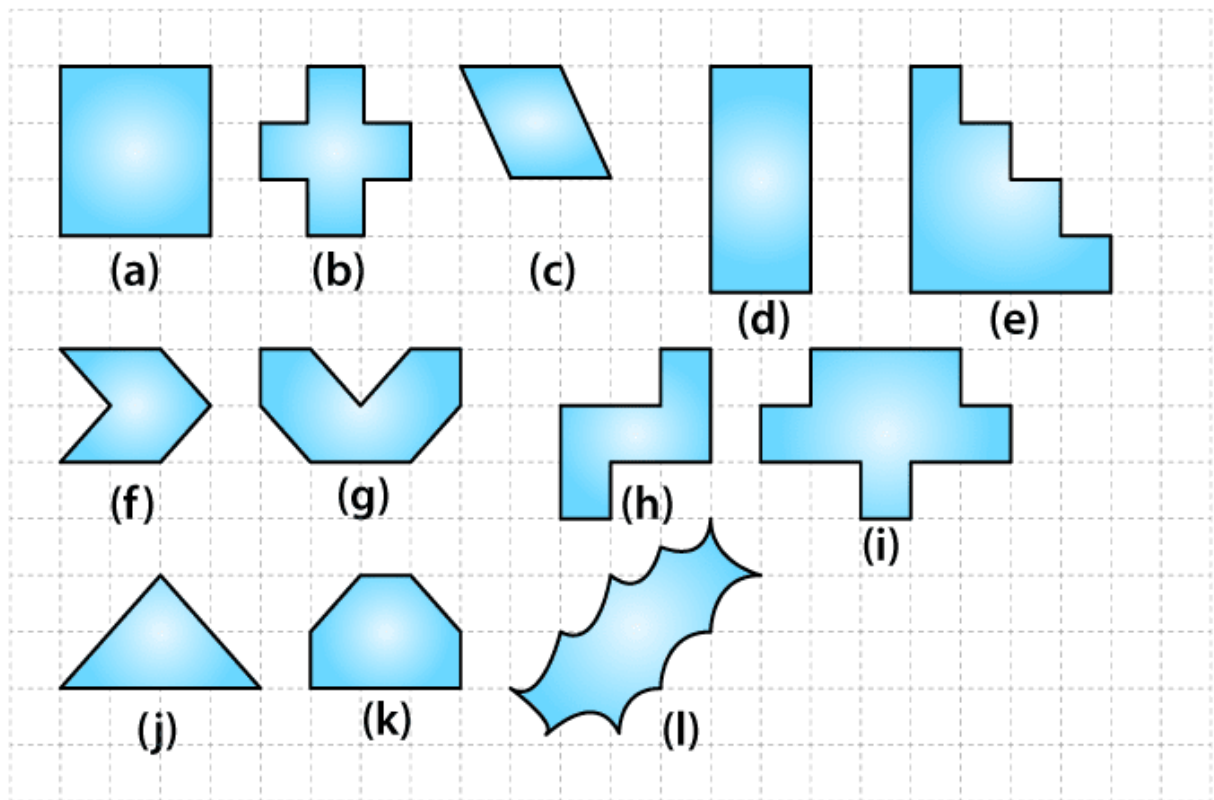
$$= 10 \text{ m}$$

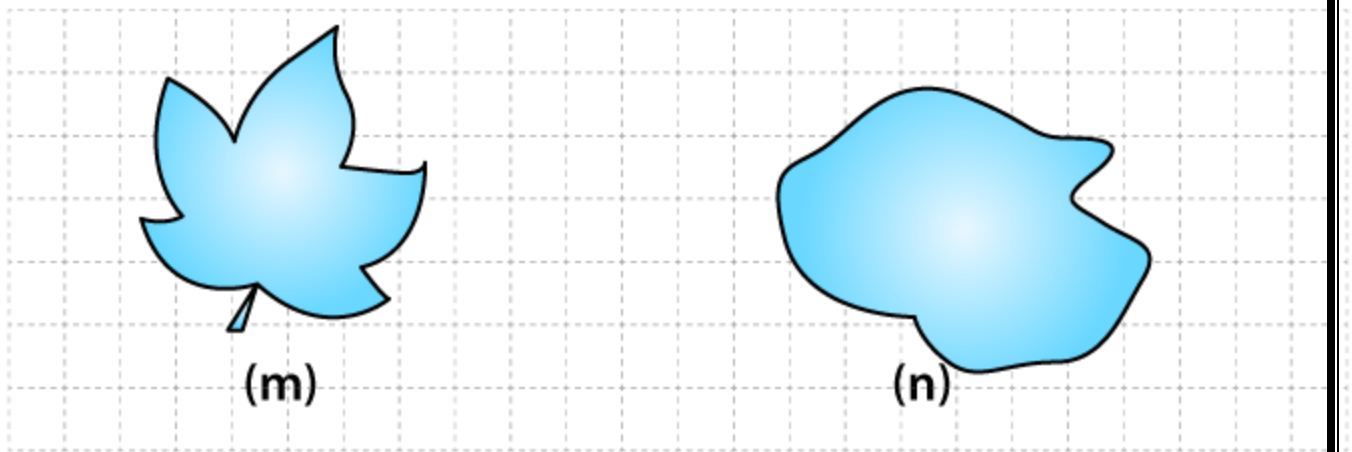
(c) The arrangement in the form of cross has greater perimeter

(d) Perimeters greater than 10 m cannot be determined.

Exercise 10.2 page no: 216

1. Find the areas of the following figures by counting square:





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

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

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

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

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

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

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

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

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

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

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

(l) From the given figure, we observe

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

Therefore total area = $2 + 6$

= 8 square units.

(m) From the given figure, we observe

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

Therefore total area = $5 + 9$

= 14 square units

(n) From the given figure, we observe

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

Therefore total area = $8 + 10 = 18$ square units

Exercise 10.3 page no: 219

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

Solutions:

We know that

Area of rectangle = Length \times Breadth

(a) $l = 3$ cm and $b = 4$ cm

Area = $l \times b = 3 \times 4$

= 12 cm²

(b) $l = 12$ m and $b = 21$ m

Area = $l \times b = 12 \times 21$

= 252 m²

(c) $l = 2$ km and $b = 3$ km

Area = $l \times b = 2 \times 3$

= 6 km²

(d) $l = 2$ m and $b = 70$ cm = 0.70 m

Area = $l \times b = 2 \times 0.70$

= 1.40 m²

2. Find the areas of the squares whose sides are:

(a) 10 cm

(b) 14 cm

(c) 5 m

Solutions:

(a) Area of square = side²

$$= 10^2$$

$$= 100 \text{ cm}^2$$

(b) Area of square = side²

$$= 14^2$$

$$= 196 \text{ cm}^2$$

(c) Area of square = side²

$$= 5^2$$

$$= 25 \text{ cm}^2$$

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?

Solutions:

(a) Area of rectangle = l × b

$$= 9 \times 6$$

$$= 54 \text{ m}^2$$

(b) Area of rectangle = l × b

$$= 17 \times 3$$

$$= 51 \text{ m}^2$$

(c) Area of rectangle = l × b

$$= 4 \times 14$$

$$= 56 \text{ m}^2$$

Area of rectangle 56 m² i.e (c) is the largest area and area of rectangle 51 m² i.e (b) is the smallest area

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

Solutions:

Area of rectangle = length × width

$$300 = 50 \times \text{width}$$

$$\text{width} = 300 / 50$$

$$\text{width} = 6 \text{ m}$$

∴ The width of the garden is 6 m

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.?

Solutions:

Area of land = length × breadth

$$= 500 \times 200$$

$$= 1,00,000 \text{ m}^2$$

$$\therefore \text{Cost of tiling } 1,00,000 \text{ sq m of land} = (8 \times 1,00,000) / 100$$

$$= ₹ 8000$$

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

Solutions:

Given

$$l = 2\text{m}$$

$$b = 1\text{m } 50 \text{ cm} = 1.50 \text{ m}$$

$$\text{Area} = l \times b = 2 \times 1.50$$

$$= 3 \text{ m}^2$$

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?

Solutions:

Given

$$l = 4\text{ m}$$

$$b = 3\text{ m } 50\text{ cm} = 3.50\text{ m}$$

$$\text{Area} = l \times b = 4 \times 3.50$$

$$= 14\text{ m}^2$$

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.

Solutions:

$$\text{Area of floor} = l \times b = 5 \times 4$$

$$= 20\text{ m}^2$$

$$\text{Area of square carpet} = 3 \times 3$$

$$= 9\text{ m}^2$$

$$\text{Area of floor that is not carpeted} = 20 - 9$$

$$= 11\text{ m}^2$$

\therefore Area of the floor that is not carpeted is 11 m^2

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?

Solutions:

$$\text{Area of flower square bed} = 1 \times 1$$

$$= 1\text{ m}^2$$

$$\text{Area of 5 square bed} = 1 \times 5$$

$$= 5\text{ m}^2$$

$$\text{Area of land} = 5 \times 4$$

$$= 20\text{ m}^2$$

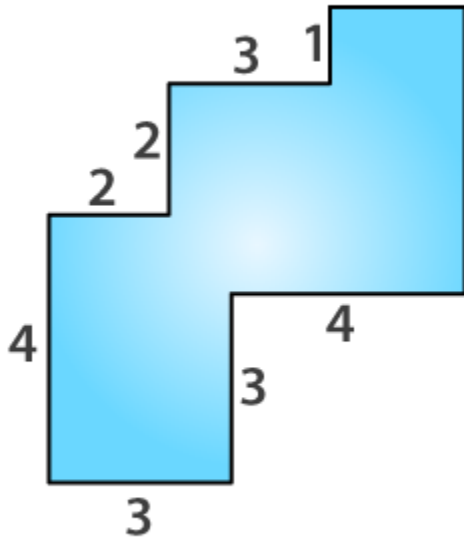
$$\text{Remaining part of the land} = \text{Area of land} - \text{Area of 5 square bed}$$

$$= 20 - 5$$

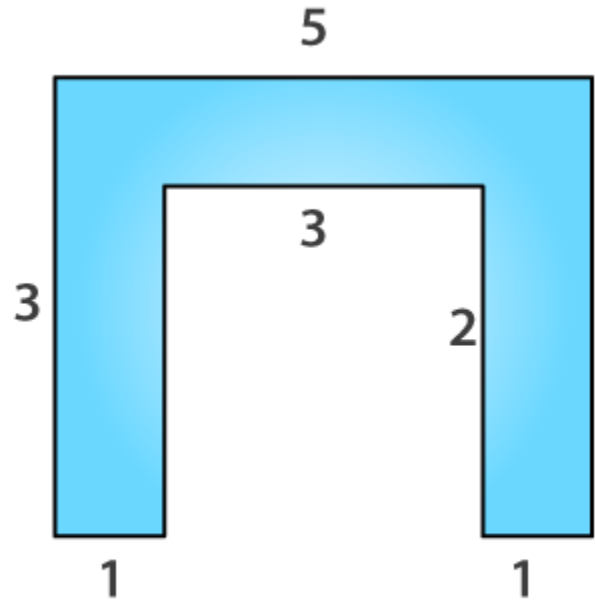
$$= 15\text{ m}^2$$

∴ Remaining part of the land is 15 m^2

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



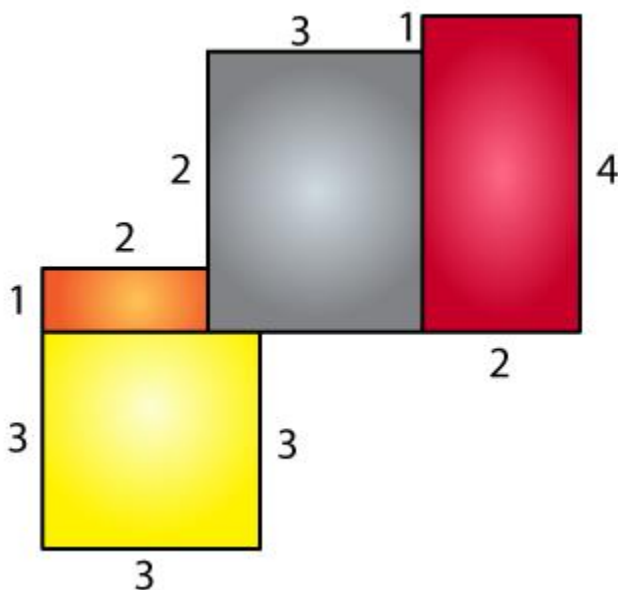
(a)



(b)

Solutions:

(a)



$$\text{Area of yellow region} = 3 \times 3$$

$$= 9 \text{ cm}^2$$

$$\text{Area of orange region} = 1 \times 2$$

$$= 2 \text{ cm}^2$$

$$\text{Area of grey region} = 3 \times 3$$

$$= 9 \text{ cm}^2$$

$$\text{Area of brown region} = 2 \times 4$$

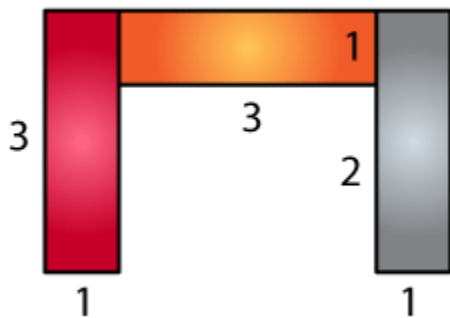
$$= 8 \text{ cm}^2$$

$$\text{Total area} = 9 + 2 + 9 + 8$$

$$= 28 \text{ cm}^2$$

\therefore Total area is 28 cm^2

(b)



$$\text{Area of brown region} = 3 \times 1$$

$$= 3 \text{ cm}^2$$

$$\text{Area of orange region} = 3 \times 1$$

$$= 3 \text{ cm}^2$$

$$\text{Area of grey region} = 3 \times 1$$

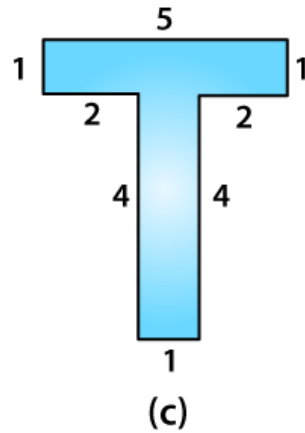
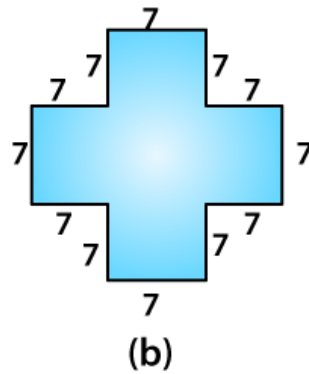
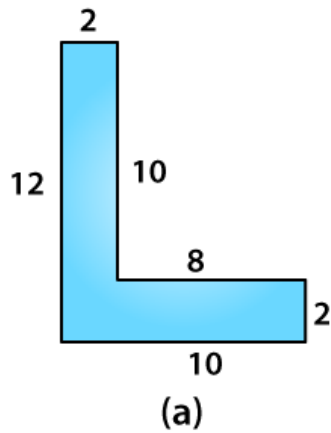
$$= 3 \text{ cm}^2$$

$$\text{Total area} = 3 + 3 + 3$$

$$= 9 \text{ cm}^2$$

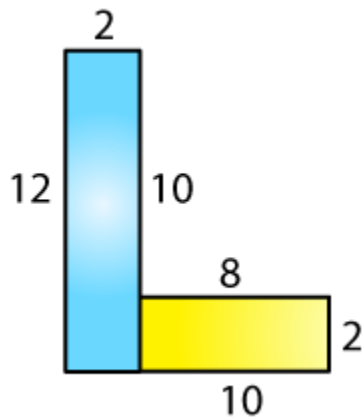
∴ Total area is 9 cm^2

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



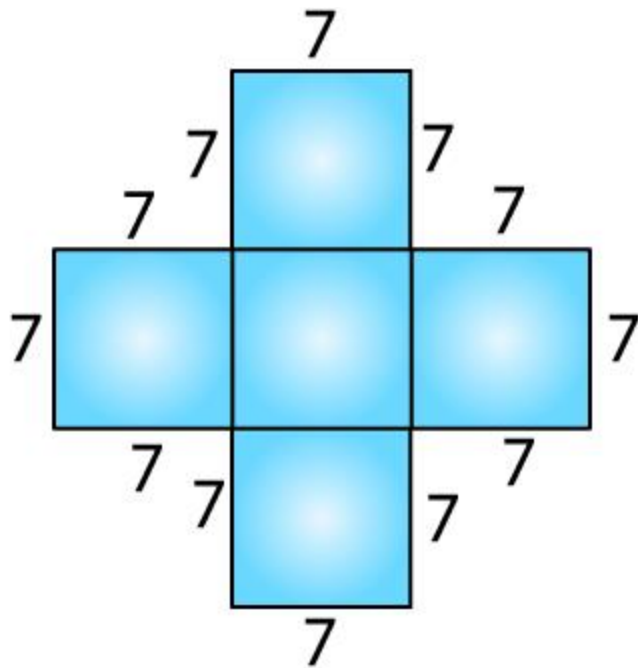
Solutions:

(a)



$$\begin{aligned} \text{Total area of the figure} &= 12 \times 2 + 8 \times 2 \\ &= 40 \text{ cm}^2 \end{aligned}$$

(b)

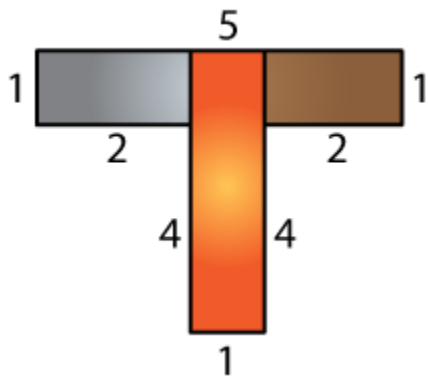


There are 5 squares. Each side is 7 cm

$$\text{Area of 5 squares} = 5 \times 7^2$$

$$= 245 \text{ cm}^2$$

(c)



$$\text{Area of grey rectangle} = 2 \times 1$$

$$= 2 \text{ cm}^2$$

$$\text{Area of brown rectangle} = 2 \times 1$$

$$= 2 \text{ cm}^2$$

$$\text{Area of orange rectangle} = 5 \times 1$$

$$= 5 \text{ cm}^2$$

$$\text{Total area} = 2 + 2 + 5$$

$$= 9 \text{ cm}^2$$

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

Solutions:

(a) Area of rectangle = 100×144

$$= 14400 \text{ cm}^2$$

$$\text{Area of one tile} = 5 \times 12$$

$$= 60 \text{ cm}^2$$

$$\text{Number of tiles} = (\text{Area of rectangle}) / (\text{Area of one tile})$$

$$= 14400 / 60$$

$$= 240$$

Hence, 240 tiles are needed

(b) Area of rectangle = 70×36

$$= 2520 \text{ cm}^2$$

$$\text{Area of one tile} = 5 \times 12$$

$$= 60 \text{ cm}^2$$

$$\text{Number of tiles} = (\text{Area of rectangle}) / (\text{Area of one tile})$$

$$= 2520 / 60$$

$$= 42$$

Hence, 42 tiles are needed.