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CLASS 6TH

MATHS

CHAPTER-10th

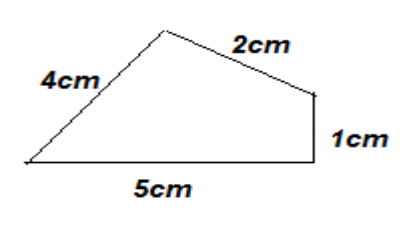
Mensuration

EXERCISE- 10.1

NCERT SOLUTION

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

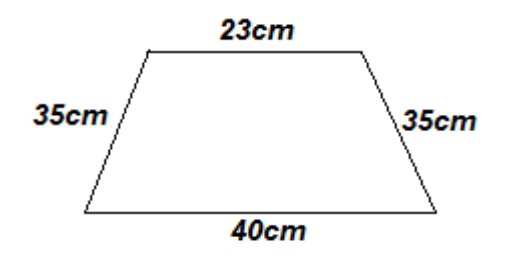
(a)



Ans.

Perimeter of the given figure = 4cm + 2cm + 1cm + 5cm = 12cm.

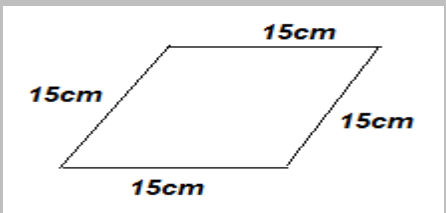
(b)



Ans.

Perimeter of the given figure = 23cm + 35cm + 40cm + 35cm = 133cm or 1.3m.

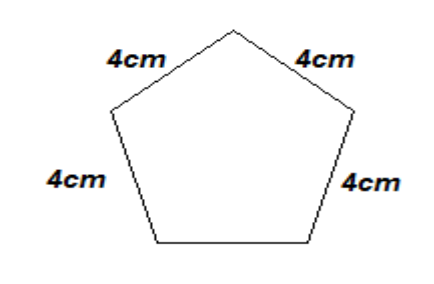
(c)



Ans.

Perimeter of the given figure = 15cm + 15cm + 15cm + 15cm = 60cm.

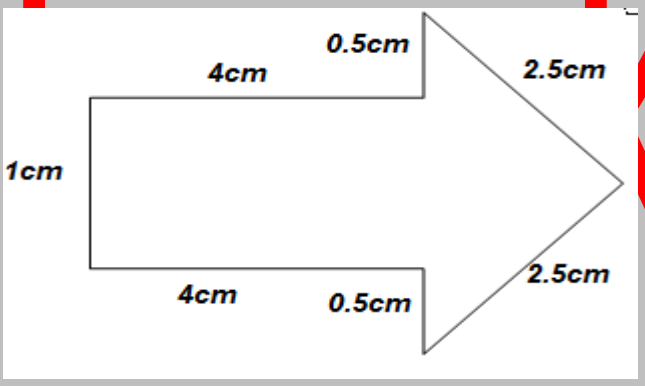
(d)



Ans.

Perimeter of the given figure = 4cm + 4cm + 4cm + 4cm + 4cm = 20cm.

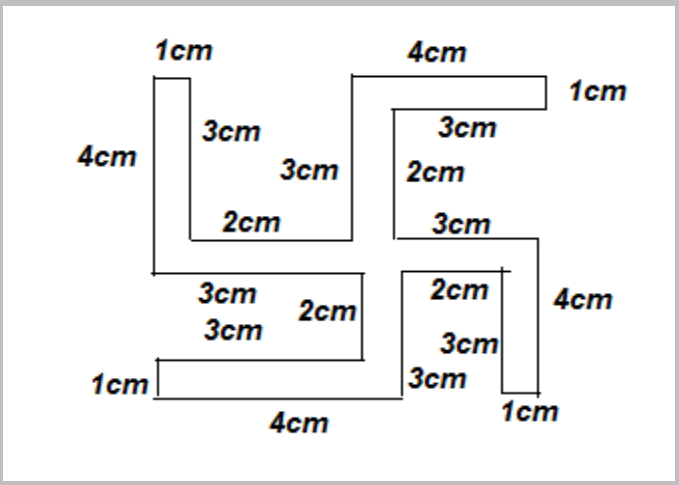
(e)



Ans.

Perimeter of the given figure = 4cm + 0.5cm + 2.5cm + 2.5cm + 0.5cm + 4cm + 1cm = 15cm.

(f)



Ans.

Required perimeter $= 4\text{ cm} + 1\text{ cm} + 3\text{ cm} + 2\text{ cm} + 3\text{ cm} + 4\text{ cm} + 1\text{ cm} + 3\text{ cm} + 2\text{ cm} + 3\text{ cm} + 4\text{ cm} + 1\text{ cm} + 3\text{ cm} + 2\text{ cm} + 3\text{ cm} + 4\text{ cm} + 1\text{ cm} + 3\text{ cm} + 2\text{ cm} + 3\text{ cm}$

$= 52\text{ cm}$

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?

Ans.

Length of the tape required = Perimeter of the Rectangular lid = $2 \times (l + b)$

$$= 2 \times (40 + 10)$$

$$= 2 \times (50)$$

$$= 100cm$$

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

Ans.

Perimeter of the table- top $= 2 \times (l + b)$

$$= 2 \times (2m\ 25cm + 1m\ 50cm)$$

$$= 2 \times (3\text{m}75\text{cm})$$

$$= 7\text{m}50\text{cm} = 7.5\text{m}$$

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

Ans.

Length of strip $= 32\text{cm}$

Breadth of Strip $= 21\text{cm}$

$$\text{Perimeter} = 2 \times (l + b)$$

$$= 2 \times (32 + 21)$$

$$= 2 \times (53)$$

$$= 106cm \text{ or } 1m\ 6cm$$

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?

Ans.

Length of the rectangular piece of land = 0.7 km = 0.7 x 1000 m = 700 m

Breadth of the rectangular piece of land = 0.5 km = 0.5 x 1000 m = 500 m

Perimeter of the rectangular piece of land = 2 × (length + breadth)

= 2 × (700 m + 500 m)

= 2 × 1200 m = 2400 m

Total length of rope required = 4 × 2400 m = 9600 m or 9.6km.

6. Find the perimeter of each of the following shapes:
(a) A triangle of sides 3 cm, 4 cm and 5 cm.
Ans.
Perimeter of triangle = Sum of all sides of a given triangle = 3cm + 4cm + 5cm = 12cm

(b) An equilateral triangle of side 9 cm.
Ans.
Perimeter of triangle = Sum of all sides of a given triangle = 9cm + 9cm + 9cm = 27cm

(c) An isosceles triangle with equal sides 8 cm each and third side 6 cm.
Ans.
Perimeter of an isosceles triangle = Sum of all sides of a given triangle = 8cm + 8cm + 6cm = 22cm

7. Find the perimeter of a triangle with sides measuring 10 cm, 14 cm and 15 cm.
Ans.
Perimeter of triangle = Sum of all sides of a given triangle = 10cm + 14cm + 15cm = 39cm

8. Find the perimeter of a regular hexagon with each side measuring 8 m.
Ans.
Perimeter of a regular hexagon = 6 x side = 6 x 8 = 48cm.

9. Find the side of the square whose perimeter is 20 m.
Ans.
Perimeter of Square = 4 x side

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

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

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

Ans.

Perimeter of the regular pentagon = 100 cm

Number of sides in regular pentagon = 5

$\therefore$ Length of each side $= \frac{Perimeter}{Number\ of\ sides}$

$= \frac{100}{5} = 20$ 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?

Ans.

(a) Length of string = 30 cm

Number of sides in a square = 4

$\therefore$ Length of each side of the square $= \frac{30}{4} = 7.50$ cm.

(b) Length of string = 30 cm

Number of sides in equilateral triangle = 3

$\therefore$ Length of each side of the equilateral triangle $= \frac{30}{3} = 10$ cm

(c) Length of string = 30 cm

Number of sides in regular hexagon = 6

$\therefore$ Length of each side of the regular hexagon $= \frac{30}{6} = 5$ 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?

Ans.

Two sides of triangle = 12cm and 14cm

Perimeter of the triangle = 36cm

Length of the third side = 36 – (12 + 14) = 10cm

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

Ans.

Length of a Square park = 250m

Perimeter of a Square park = 4 x side

= 4 x 250 = 1000m

Cost of fencing a Square park = ₹20 per metre

∴ Cost of Fencing = 1000 x 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 metre.

Ans.

Length of the park = 175m

Breadth of the park = 125m

Perimeter of a park = 2 x (l + b)

= 2 x (175 + 125)

= 2 x 300 = 600m

Cost of fencing a rectangular park = ₹12 per metre

∴ Cost of Fencing = 600 x 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?

Ans.

Sweety

Side of the square park = 75 m

Perimeter of square park = 4 x side

∴ Perimeter of square park = 4 x 75 m = 300 m

Bulbul

Perimeter of the rectangular park = 2 [length + breadth]

Perimeter of the rectangular park = 2 [60 m + 45 m]

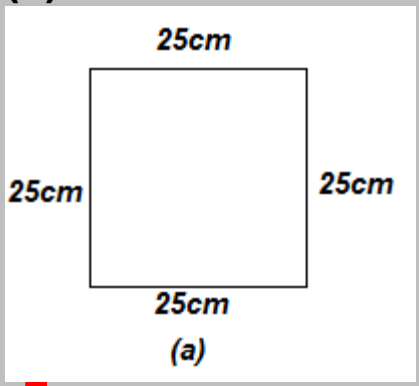
= 2 x 105 m = 210 m.

Since 210 m < 300 m.

So, Bulbul covers less distance.

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

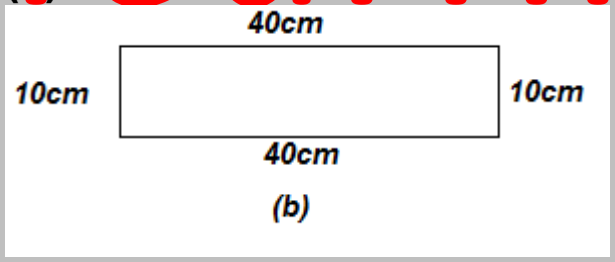
(a)



Ans.

Perimeter of the square = 25 + 25 + 25 + 25 = 4 x 25 cm = 100 cm

(b)

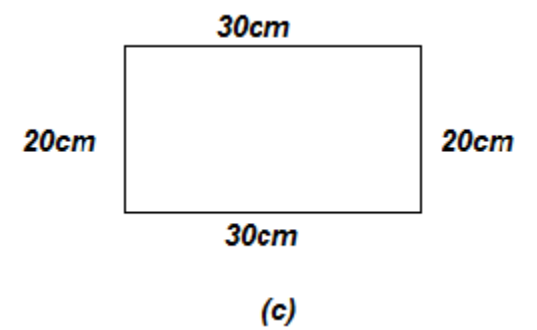


Ans.

Perimeter of the rectangle = 40 cm + 10 cm + 40 cm + 10 cm

= 2 [40 cm + 10 cm] = 2 x 50 cm = 100cm

(c)

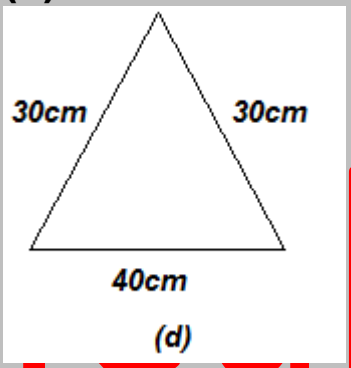


Ans.

Perimeter of the rectangle = 30 cm + 20 cm + 30 cm + 20 cm

= 2 [30 cm + 20 cm] = 2 x 50 cm = 100 cm

(d)



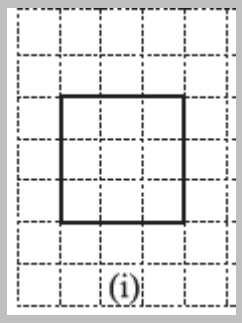
Ans.

Perimeter of the triangle = Sum of all sides = 30 cm + 30 cm + 40 cm = 100 cm

From all the above figures we inferred that 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.

(a) What is the perimeter of his arrangement.



Ans.

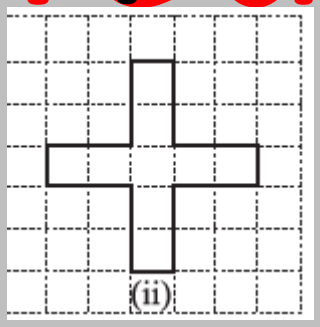
Side of square $= \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 1\frac{1}{2}$

$\therefore$ Perimeter of the square arrangement $= 4$ x side

$$= 4 \text{ x } 1\frac{1}{2}$$

$$= 4 \text{ x } \frac{3}{2} = 6\text{m}$$

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



Ans.

Perimeter of cross arrangement $= \frac{1}{2} + 1 + 1 + \frac{1}{2} + 1 + 1 + \frac{1}{2} + 1 + 1 + \frac{1}{2} + 1 + 1 = 10\text{m}$

(c) Which has greater perimeter?

Ans.

Perimeter of cross arrangement is greater.

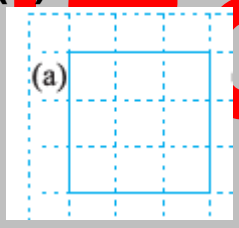
(d) Avneet wonders if there is a way of getting an even greater perimeter. Can you find a way of doing this? (The paving slabs must meet along complete edges i.e. they cannot be broken.)

Ans

EXERCISE- 10.2
NCERT SOLUTION

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

(a)



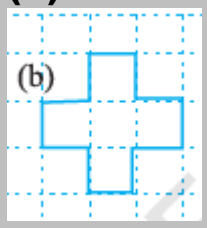
Ans.

Number of full square = 9

Area of 1square = 1sq unit

∴Area of the figure = 9 x 1 = 9 sq units.

(b)



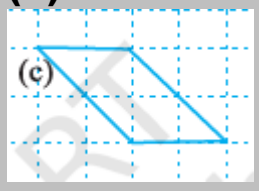
Ans.

Number of full square = 5

Area of 1square = 1sq unit

∴Area of the figure = 5 x 1 = 5 sq units.

(c)



Ans.

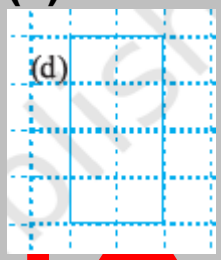
Number of full square = 2

Number of half square = 4

Area of 1square = 1sq unit

$\therefore$Area of the figure = $2 \times 1 + 4 \times \frac{1}{2} = 2 + 2 = 4$ sq unit.

(d)



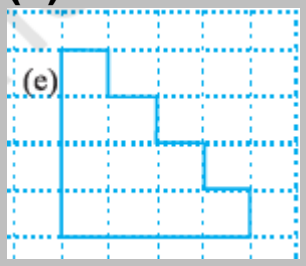
Ans.

Number of full square = 8

Area of 1square = 1sq unit

$\therefore$Area of the figure = $8 \times 1 = 8$ sq units.

(e)



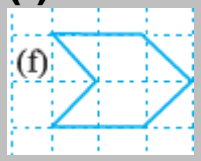
Ans.

Number of full square = 10

Area of 1square = 1sq unit

$\therefore$Area of the figure = $10 \times 1 = 10$ sq units.

(f)



Ans.

Number of full square = 2

Number of half square = 4

Area of 1square = 1sq unit

∴Area of the figure = $2 \times 1 + 4 \times \frac{1}{2} = 2 + 2 = 4$ sq unit.

(g)

Ans.

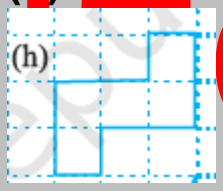
Number of full square = 4

Number of half square = 4

Area of 1square = 1sq unit

∴Area of the figure = $4 \times 1 + 4 \times \frac{1}{2} = 4 + 2 = 6$ sq unit.

(h)



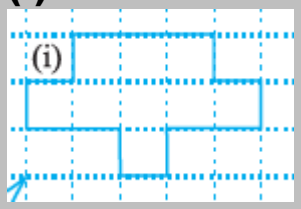
Ans.

Number of full square = 5

Area of 1square = 1sq unit

∴Area of the figure = $5 \times 1 = 5$ sq units.

(i)



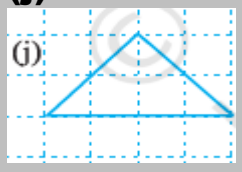
Ans.

Number of full square = 9

Area of 1square = 1sq unit

∴Area of the figure = $9 \times 1 = 9$ sq units.

(j)



Ans.

Number of full square = 2

Number of half square = 4

Area of 1square = 1sq unit

$\therefore$Area of the figure = $2 \times 1 + 4 \times \frac{1}{2} = 2 + 2 = 4$ sq unit.

(k)

Ans.

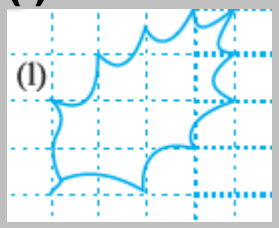
Number of full square = 4

Number of half square = 2

Area of 1square = 1sq unit

$\therefore$Area of the figure = $4 \times 1 + 2 \times \frac{1}{2} = 4 + 1 = 5$ sq unit,

(l)



Ans.

Number of full square = 4

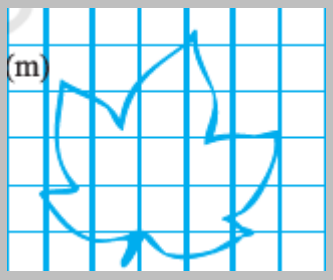
Number of half square = 2

Number of more than half = 3

Area of 1square = 1sq unit

$\therefore$Area of the figure = $4 \times 1 + 3 \times 1 + 2 \times \frac{1}{2} = 4 + 3 + 1 = 8$ sq unit.

(m)



Ans.

Number of full square = 7

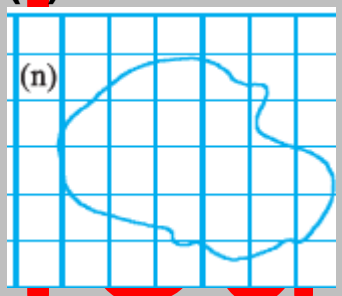
Number of half square = 4

Number of more than half = 5

Area of 1square = 1sq unit

$\therefore$Area of the figure = $7 \times 1 + 5 \times 1 + 4 \times \frac{1}{2} = 7 + 5 + 2 = 14$ sq unit.

(n)



Ans.

Number of full square = 10

Number of half square = 6

Number of more than half = 5

Area of 1square = 1sq unit

$\therefore$Area of the figure = $10 \times 1 + 5 \times 1 + 6 \times \frac{1}{2} = 10 + 5 + 3 = 18$ sq unit.

EXERCISE- 10.3

NCERT SOLUTION

1. Find the areas of the rectangles whose sides are:

(a) 3 cm and 4 cm

Ans.

Area of rectangle = length x breadth

Area of rectangle = 3cm x 4cm = $12cm^2$.

(b) 12 m and 21 m

Ans.

Area of rectangle = length x breadth

Area of rectangle = 12m x 21m = $252m^2$.

(c) 2 km and 3 km

Ans.

Area of rectangle = length x breadth

Area of rectangle = 2km x 3km = $6km^2$.

(d) 2 m and 70 cm

Area of rectangle = length x breadth

Length of Rectangle = 2m = 2 x 100 = 200cm

Area of rectangle = 200cm x 70cm = $14000cm^2$ or $1.4m^2$

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

(a) 10 cm

Ans.

Area of square = Side x Side

Area of square = 10cm x 10cm =$100cm^2$.

(b) 14 cm

Ans.

Area of square = Side x Side

Area of square = 14cm x 14cm = $196cm^2$.

(c) 5 m

Ans.

Area of square = Side x Side

Area of square = 5cm x 5cm =$25cm^2$.

3. The length and breadth of three rectangles are as given below: Which one has the largest area and which one has the smallest?

(a) 9 m and 6 m

Ans.

Area of rectangle = length x breadth

Area of rectangle = 9m x 6m = 54m².

(b) 17 m and 3 m

Ans.

Area of rectangle = length x breadth

Area of rectangle = 17m x 3m = 51m².

(c) 4 m and 14 m

Ans.

Area of rectangle = length x breadth

Area of rectangle = 4m x 14m = 56m².

Largest area = Rectangle (c) = 56m²

Smallest Area =Rectangle (b)= 51m²

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

Ans.

Area of Rectangle = 300cm²

Length of Rectangle = 50m

$$\text{Width of Rectangle} = \frac{Area\ of\ Rectangle}{Width\ of\ Rectangle}$$

$$\text{Width of Rectangle} = \frac{300}{50} = 6\text{m}$$

Hence, width of the garden =6m

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?

Ans.

Length of Rectangular plot = 500m
Breadth of Rectangular plot = 200m
Area of Rectangular plot = Length x Breadth
Area of Rectangular plot = 500 x 200 = 1,00,000 sq.m
Rate of tiling a rectangular plot = ₹8 per hundred sq m
Cost of tiling 1,00,000 sqm of land = $\frac{8 \times 100000}{100}$ = ₹8,000.

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

Ans.

Length of table = 2m
Breadth of table = 1m 50cm = 1.50m
Area of rectangular table = length x breadth
Area of table = 2 x 1.5 = $3m^2$

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?

Ans.

Length of Room = 4m
Breadth of room = 3m 50cm = 3.50m
Area of carpet = length x breadth
Area of carpet = 4 x 3.50 = $14m^2$

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.

Ans.

Length of floor = 5m
Breadth of floor = 4m
Area of floor = Length x breadth
Area of floor = 5m x 4m = $20m^2$
Sides of square carpet = 3m
Area of square carpet = 3 x 3 = $9m^2$
Area of floor that is not carpeted = $20 - 9 = 11m^2$

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

Ans.

Side of square bed = 1m

Area of Square bed = Side x side

Area of 1 square bed = 1 x 1 =$1m^2$

∴Area of 5 square bed = $5m^2$

Now,

Length of land = 5m

Breadth of land = 4m

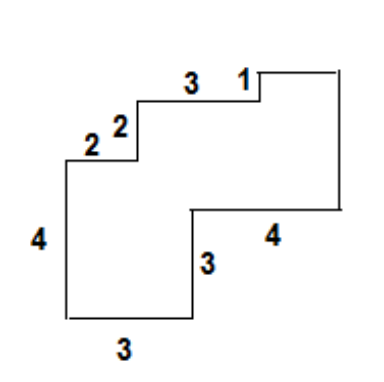
Area of the land = length x breadth

Are of the land = 5 x 4 = $20m^2$

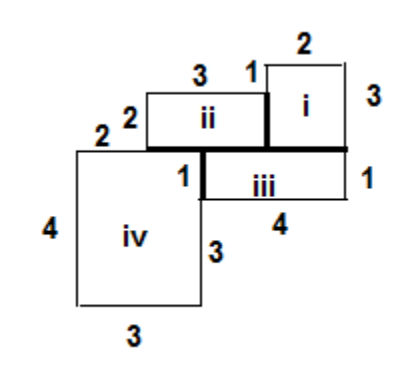
Area of remaining land = $20 - 5 = 15m^2$

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

(a)

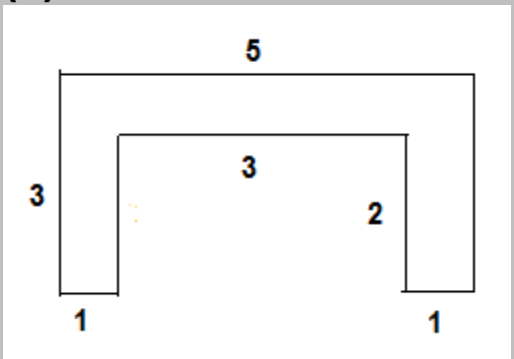


Ans.

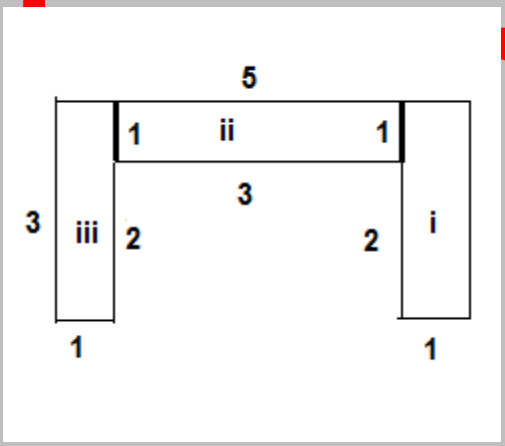


By splitting the following figure into rectangle
Area of rectangle (i) = length x breadth = 3 x 2 = 6 cm^2
Area of rectangle (ii) = length x breadth = 3 x 2 = 6 cm^2
Area of rectangle (iii) = length x breadth = 4 x 1 = 4 cm^2
Area of rectangle (iv) = length x breadth = 4 x 3 = 12 cm^2
Total Area = 6 + 6 + 4 + 12 = 28 cm^2

(b)



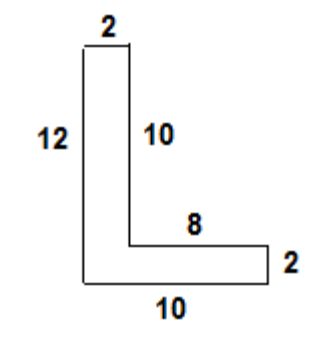
Ans.



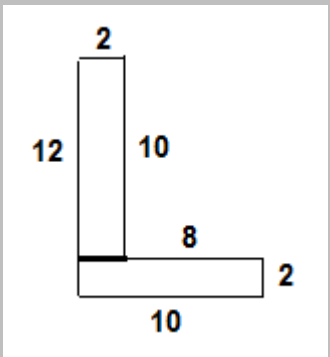
By splitting the following figure into rectangle
Area of rectangle (i) = length x breadth = 3 x 1 = 3 cm^2
Area of rectangle (ii) = length x breadth = 3 x 1 = 3 cm^2
Area of rectangle (iii) = length x breadth = 3 x 1 = 3 cm^2

Total Area = 3 + 3 + 3 = 9 cm^2

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



Ans.



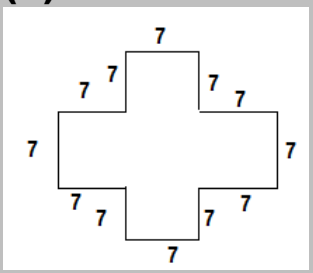
Area of Rectangle = length x breadth

$= 10 \times 2 = 20cm^2$

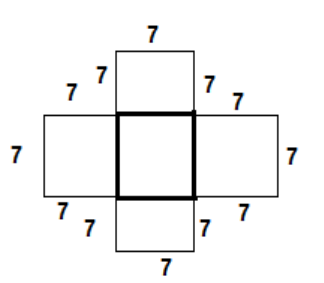
$= 10 \times 2 = 20cm^2$

Total Area = $20 + 20 = 40cm^2$

(b)



Ans.



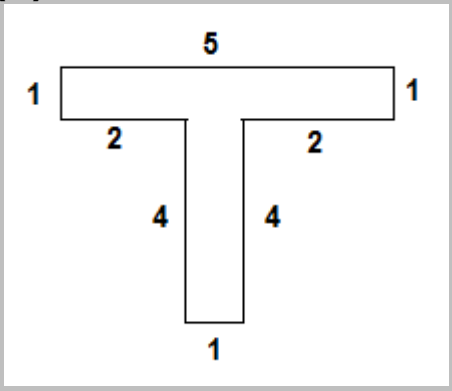
In the given figure, there are 5 squares each of side 5cm.

Area of one square = side x side

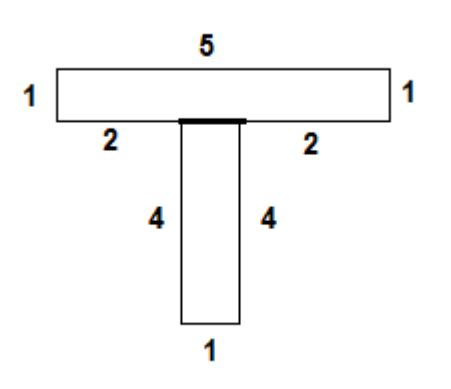
= 7 x 7 =49 cm^2

Area of 5 squares = 49 x 5 =245cm^2

(c)



Ans.



Ans.

Area of Rectangle = length x breadth

= 5 x 1 = 5cm^2

= 4x 1 = 4cm^2

Total Area = 5 + 4 = 9cm^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 :

Ans.

Length of one tile = 12 cm
Breadth of the tile = 5 cm
∴ Area of 1 tile = length x breadth = 12 cm x 5 cm = 60 cm^2

(a) 100 cm and 144 cm

Ans.

Length of the rectangular region = 144 cm
Breadth of the region = 100 cm
∴ Area of the rectangular region = length x breadth = 144 cm x 100 cm
= 14400 cm^2
∴ Number of tiles needed to cover the whole rectangular region = $\frac{14400}{60}$ = 240 tiles

(b) 70 cm and 36 cm.

Length of the rectangular region = 70 cm
Breadth of the region = 36 cm

∴ Area of the rectangular region = length x breadth = 70 cm x 36 cm = 2520 sq cm

∴ Number of tiles needed to cover the whole rectangular region = $\frac{2520}{60}$ = 42 tiles.