

EXERCISE 20.4

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**1. Find the area of a rectangle, whose****(i) Length = 6 cm, breadth = 3 cm****(ii) Length = 8 cm, breadth = 3 cm****(iii) Length = 4.5 cm, breadth = 2 cm.****Solution:**

(i) We know that area of a rectangle =  $L \times B$

It is given that Length = 6 cm, breadth = 3 cm

By substituting the values

$$\text{Area of a rectangle} = 6 \times 3 = 18 \text{ cm}^2$$

(ii) We know that area of a rectangle =  $L \times B$

It is given that Length = 8 cm, breadth = 3 cm

By substituting the values

$$\text{Area of a rectangle} = 8 \times 3 = 24 \text{ cm}^2$$

(iii) We know that area of a rectangle =  $L \times B$

It is given that Length = 4.5 cm, breadth = 2 cm

By substituting the values

$$\text{Area of a rectangle} = 4.5 \times 2 = 9 \text{ cm}^2$$

**2. Find the area of a square whose side is:****(i) 5 cm****(ii) 4.1 cm****(iii) 5.5 cm****(iv) 2.6 cm****Solution:**

(i) We know that area of a square = side  $\times$  side

It is given that side of a square = 5 cm

$$\text{So the area of the square} = 5 \times 5 = 25 \text{ cm}^2$$

(ii) We know that area of a square = side  $\times$  side

It is given that side of a square = 4.1 cm

$$\text{So the area of the square} = 4.1 \times 4.1 = 16.81 \text{ cm}^2$$

(iii) We know that area of a square = side  $\times$  side

It is given that side of a square = 5.5 cm

$$\text{So the area of the square} = 5.5 \times 5.5 = 30.25 \text{ cm}^2$$

(iv) We know that area of a square = side  $\times$  side

It is given that side of a square = 2.6 cm

$$\text{So the area of the square} = 2.6 \times 2.6 = 6.76 \text{ cm}^2$$

**3. The area of a rectangle is  $49 \text{ cm}^2$  and its breadth is 2.8 cm. Find the length of the rectangle.****Solution:**

It is given that area of a rectangle =  $49 \text{ cm}^2$

Breadth of a rectangle = 2.8 cm

We know that

Area of a rectangle =  $L \times B$

It can be written as

$$L = \text{Area}/B = 49/2.8 = 17.5 \text{ cm}$$

Hence, the length of the rectangle is 17.5 cm.

**4. The side of a square is 70 cm. Find its area and perimeter.**

**Solution:**

It is given that side of a square = 70 cm

We know that area of a square = side  $\times$  side

By substituting the values

$$\text{Area of a square} = 70 \times 70 = 4900 \text{ cm}^2$$

We know that perimeter of a square =  $4 \times$  side

By substituting the values

$$\text{Perimeter of a square} = 4 \times 70 = 280 \text{ cm}$$

Hence, the area of square is  $4900 \text{ cm}^2$  and the perimeter of square is 280 cm.

**5. The area of a rectangle is  $225 \text{ cm}^2$  and its one side is 25 cm, find its other side.**

**Solution:**

It is given that

$$\text{Area of a rectangle} = 225 \text{ cm}^2$$

$$\text{Length of one side} = 25 \text{ cm}$$

We know that area of a rectangle = Product of length of two sides

So the other side = area/side

By substituting the values

$$\text{Other side} = 225/25 = 9 \text{ cm}$$

Hence, the other side of the rectangle is 9 cm.

**6. What will happen to the area of rectangle if its**

**(i) Length and breadth are trebled**

**(ii) Length is doubled and breadth is same**

**(iii) Length is doubled and breadth is halved.**

**Solution:**

(i) Length and breadth are trebled

Consider  $l$  as the initial length and  $b$  as the initial breadth

So the original area =  $l \times b$

If the length and breadth are trebled it becomes three times more than the original value

$$\text{New length} = 3l$$

$$\text{New breadth} = 3b$$

$$\text{New area of the rectangle} = 3l \times 3b = 9lb$$

Hence, the area of the rectangle becomes 9 times more than its original area.

(ii) Length is doubled and breadth is same  
Consider  $l$  as the initial length and  $b$  as the initial breadth  
So the original area =  $l \times b$   
If the length is doubled and breadth is same we get  
New length =  $2l$   
New breadth =  $b$   
New area of the rectangle =  $2l \times b = 2lb$

Hence, the area of the rectangle becomes 2 times more than the original area.

(iii) Length is doubled and breadth is halved  
Consider  $l$  as the initial length and  $b$  as the initial breadth  
So the original area =  $l \times b$   
If the length is doubled and breadth is halved we get  
New length =  $2l$   
New breadth =  $b/2$   
New area of the rectangle =  $2l \times b/2 = lb$

Hence, the area of the rectangle does not change.

**7. What will happen to the area of a square if its side is:**

**(i) Tripled**

**(ii) Increased by half of it.**

**Solution:**

(i) Tripled

Consider  $s$  as the original side of the square  
We know that original area =  $s \times s = s^2$   
If the side of the square is tripled we get  
New side =  $3s$   
So the new area of the square =  $3s \times 3s = 9s^2$

Hence, the area becomes 9 times more than that of the original area.

(ii) Increased by half of it

Consider  $s$  as the original side of the square  
We know that original area =  $s \times s = s^2$   
If the side of the square is increased by half of it we get  
New side =  $s + s/2 = 3s/2$   
So the new area of the square =  $3s/2 \times 3s/2 = 9s^2/4$

Hence, the area becomes  $9/4$  times more than that of the original area.

**8. Find the perimeter of a rectangle whose area is  $500 \text{ cm}^2$  and breadth is 20 cm.**

**Solution:**

It is given that

Area of the rectangle =  $500 \text{ cm}^2$

Breadth of the rectangle = 20 cm

We know that area =  $L \times B$

It can be written as

$$L = \text{Area}/B$$

By substituting the values

$$L = 500/20 = 25 \text{ cm}$$

We know that perimeter =  $2(L + B)$

By substituting the values

$$\text{Perimeter} = 2(25 + 20) = 2 \times 45 = 90 \text{ cm}$$

Hence, the perimeter of the rectangle is 90 cm.

**9. A rectangle has the area equal to that of a square of side 80 cm. If the breadth of the rectangle is 20 cm, find its length.**

**Solution:**

It is given that

$$\text{Side of a square} = 80 \text{ cm}$$

So the area of the square = side  $\times$  side

By substituting the values

$$\text{Area of square} = 80 \times 80 = 6400 \text{ cm}^2$$

We know that area of rectangle = area of square =  $6400 \text{ cm}^2$

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

$$\text{Area of rectangle} = L \times B$$

It can be written as

$$L = \text{Area}/B = 6400/20 = 320 \text{ cm}$$

Hence, the length of the rectangle is 320 cm.

**10. Area of a rectangle of breadth 17 cm is  $340 \text{ cm}^2$ . Find the perimeter of the rectangle.**

**Solution:**

The dimensions of rectangle are

$$\text{Breadth} = 17 \text{ cm}$$

$$\text{Area} = 340 \text{ cm}^2$$

We know that

$$\text{Area of rectangle} = L \times B$$

It can be written as

$$L = \text{Area}/B = 340/17 = 20 \text{ cm}$$

So the perimeter =  $2(L + B)$

By substituting the values

$$\text{Perimeter} = 2(20 + 17) = 2 \times 37 = 74 \text{ cm}$$

Hence, the perimeter of the rectangle is 74 cm.

**11. A marble tile measures  $15 \text{ cm} \times 20 \text{ cm}$ . How many tiles will be required to cover a wall of size  $4 \text{ m} \times 6 \text{ m}$ ?**

**Solution:**

Measure of marble tile =  $15 \text{ cm} \times 20 \text{ cm}$   
Size of wall =  $4 \text{ m} \times 6 \text{ m} = 400 \text{ cm} \times 600 \text{ cm}$   
So we get area of tile =  $15 \text{ cm} \times 20 \text{ cm} = 300 \text{ cm}^2$   
Area of wall =  $400 \text{ cm} \times 600 \text{ cm} = 240000 \text{ cm}^2$

No. of tiles required to cover the wall = Area of wall / Area of one tile  
Substituting the values  
No. of tiles required to cover the wall =  $240000/300 = 800$  tiles

Hence, 800 tiles are required to cover a wall of size  $4 \text{ m} \times 6 \text{ m}$ .

**12. A marble tile measures  $10 \text{ cm} \times 12 \text{ cm}$ . How many tiles will be required to cover a wall of size  $3 \text{ m} \times 4 \text{ m}$ ? Also, find the total cost of the tiles at the rate of Rs 2 per tile.**

**Solution:**

Measure of marble tile =  $10 \text{ cm} \times 12 \text{ cm}$   
Size of the wall =  $3 \text{ m} \times 4 \text{ m} = 300 \text{ cm} \times 400 \text{ cm}$   
So the area of marble tile =  $10 \text{ cm} \times 12 \text{ cm} = 120 \text{ cm}^2$   
Area of wall =  $300 \text{ cm} \times 400 \text{ cm} = 120000 \text{ cm}^2$

No. of tiles required to cover the wall = Area of wall / Area of one tile  
Substituting the values  
No. of tiles required to cover the wall =  $120000/120 = 1000$  tiles

It is given that  
Cost of one tile = Rs 2  
So the cost of 1000 tiles =  $1000 \times 2 = \text{Rs } 2000$

Hence, 1000 number of tiles are required to cover the wall and the cost is Rs 2000.

**13. One side of a square plot is 250 m, find the cost of levelling it at the rate of Rs 2 per square metre.**

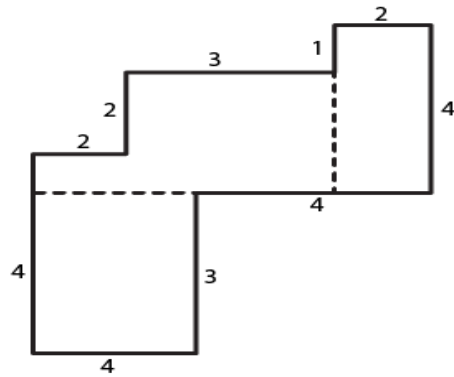
**Solution:**

It is given that  
Side of one tile of a square plot = 250 m  
So the area = side  $\times$  side =  $250 \times 250 = 62500 \text{ m}^2$

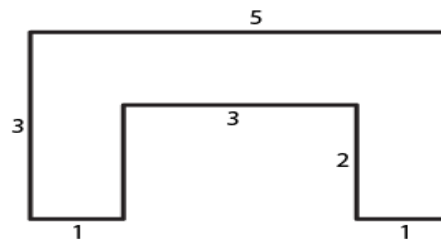
Cost of levelling = Rs 2 per square meter  
So the cost of levelling  $62500 \text{ m}^2 = 62500 \times 2 = \text{Rs } 125000$

Hence, the cost of levelling is Rs 125000.

**14. The following figures have been split into rectangles. Find their areas. (The measures are given in centimetres)**



(i)



(ii)

**Solution:**

(i) The given figure has two triangles II and IV and two squares I and III.

So the area of square I = side  $\times$  side =  $3 \times 3 = 9 \text{ cm}^2$

The same way area of rectangle II =  $L \times B = 2 \times 1 = 2 \text{ cm}^2$

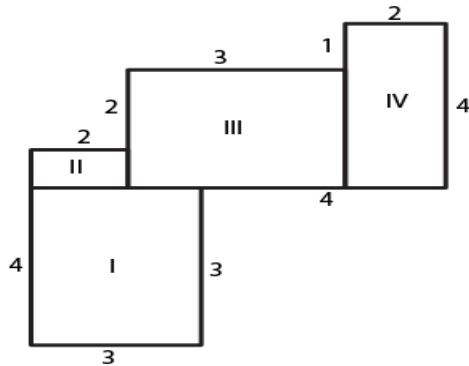
Area of square III = side  $\times$  side =  $3 \times 3 = 9 \text{ cm}^2$

Similarly area of rectangle IV =  $L \times B = 2 \times 4 = 8 \text{ cm}^2$

So the total area of the figure = Area of square I + Area of rectangle II + Area of square III + Area of rectangle IV

By substituting the values

Total area of the figure =  $9 + 2 + 9 + 8 = 28 \text{ cm}^2$



(ii) The given figure has three rectangles I, II and III.

So the area of rectangle I =  $L \times B = 3 \times 1 = 3 \text{ cm}^2$

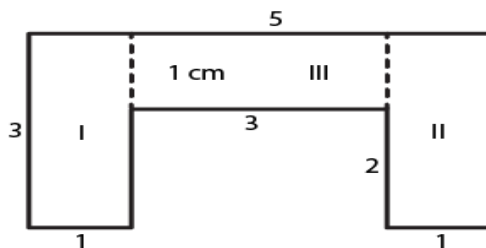
Area of rectangle II =  $L \times B = 3 \times 1 = 3 \text{ cm}^2$

Area of rectangle III =  $L \times B = 3 \times 1 = 3 \text{ cm}^2$

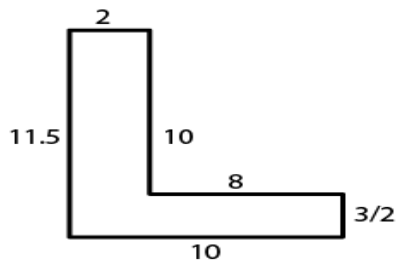
So the total area of the figure = Area of rectangle I + Area of rectangle II + Area of rectangle III

By substituting the values

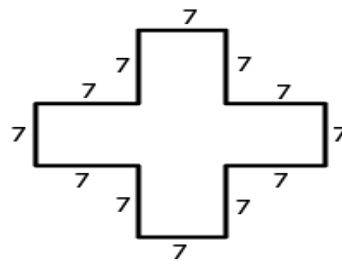
Total area of the figure =  $3 + 3 + 3 = 9 \text{ cm}^2$



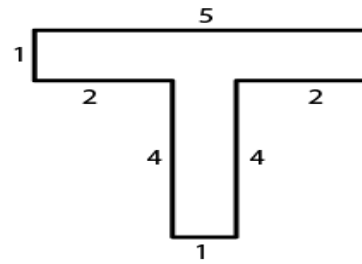
15. Split the following shapes into rectangles and find the area of each. (The measures are given in centimetres)



(i)



(ii)



(iii)

**Solution:**

(i) The given figure has two rectangles I and II.

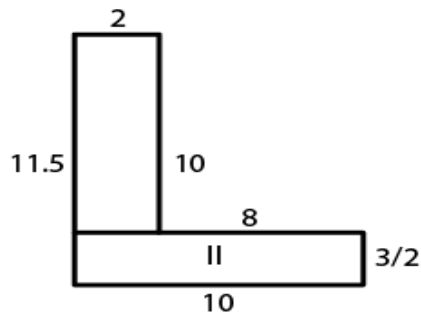
So the area of rectangle I =  $L \times B = 10 \times 2 = 20 \text{ cm}^2$

In the same way area of rectangle II =  $L \times B = 10 \times 3/2 = 15 \text{ cm}^2$

So the total area of the figure = Area of rectangle I + Area of rectangle II

By substituting the values

Total area of the figure =  $20 + 15 = 35 \text{ cm}^2$



(ii) The given figure has two squares I and II and one rectangle II.

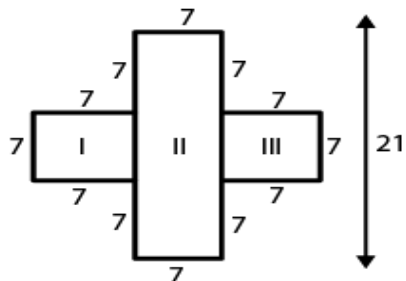
So the area of square I = Area of square III = side  $\times$  side =  $7 \times 7 = 49 \text{ cm}^2$

The area of rectangle II =  $21 \times 7 = 147 \text{ cm}^2$

So the total area of the figure = Area of square I + Area of rectangle II + Area of square III

By substituting the values

Total area of the figure =  $49 + 49 + 147 = 245 \text{ cm}^2$



(iii) The given figure has two rectangles I and II.

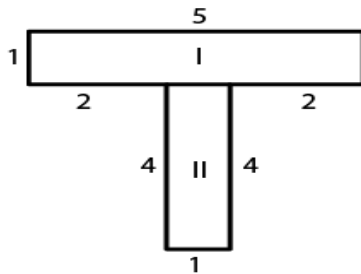
So the area of rectangle I =  $L \times B = 5 \times 1 = 5 \text{ cm}^2$

The same way, area of rectangle II =  $L \times B = 4 \times 1 = 4 \text{ cm}^2$

So the total area of the figure = Area of rectangle I + Area of rectangle II

By substituting the values

Total area of the figure =  $5 + 4 = 9 \text{ cm}^2$



**16. How many tiles with dimensions 5 cm and 12 cm will be needed to fit a region whose length and breadth are respectively:**

**(i) 100 cm and 144 cm**

**(ii) 70 cm and 36 cm**

**Solution:**

(i) Tile dimensions =  $5 \text{ cm} \times 12 \text{ cm}$

Region dimensions =  $100 \text{ cm} \times 144 \text{ cm}$

So the area of tile =  $5 \text{ cm} \times 12 \text{ cm} = 60 \text{ cm}^2$

Similarly area of region =  $100 \text{ cm} \times 144 \text{ cm} = 14400 \text{ cm}^2$

No. of tiles which is required to cover the region = Area of region/ Area of one tile

By substituting the values

No. of tiles which is required to cover the region =  $14400/60 = 240$  tiles

(ii) Tile dimensions =  $5 \text{ cm} \times 12 \text{ cm}$

Region dimensions =  $70 \text{ cm} \times 36 \text{ cm}$

So the area of tile =  $5 \text{ cm} \times 12 \text{ cm} = 60 \text{ cm}^2$

Similarly area of region =  $70 \text{ cm} \times 36 \text{ cm} = 2520 \text{ cm}^2$

No. of tiles which is required to cover the region = Area of region/ Area of one tile

By substituting the values

No. of tiles which is required to cover the region =  $2520/60 = 42$  tiles