Area

Exercise 66:

Solution 1:

1. Area of a rectangle = length × breadth
2. Area of a square = side × side = $(side)^2$

Solution 2:

Length of the rectangle = 4 cm
Breadth of the rectangle = 2 cm
Area of a rectangle = length × breadth
= 4 × 2
= 8 sq. cm
Thus, the area of the rectangle is 8 sq. cm.

Solution 3:

Side of the square = 40 cm
Area of a square = $(side)^2$ = $(40)^2$ = 1600 sq. cm
Thus, the area of the square is 1600 sq. cm

Exercise 67:

Solution 1:

1. Length = 32.5 cm, breadth = 16.2 cm
   Area of a rectangle = length x breadth
   = 32.5 x 16.2
   = 526.5 sq. cm
   ∴ Area of the rectangle is 526.5 sq. cm.

2. Length = 28.4 m, breadth = 10.4 m
   Area of a rectangle = length x breadth
   = 28.4 x 10.4
   = 295.36 sq. m
   ∴ Area of the rectangle is 295.36 sq. m.

3. Length = 14.5 m, breadth = 9.3 m
   Area of a rectangle = length x breadth
   = 14.5 x 9.3
   = 134.85 sq. m
   ∴ Area of the rectangle is 134.85 sq. m.

4. Length = 25.8 cm, breadth = 2.5 cm
   Area of a rectangle = length x breadth
   = 25.8 x 2.5
   = 64.5 sq. cm
   ∴ Area of the rectangle is 64.5 sq. cm.

Solution 2:

1. Side of the square = 35.5 cm

   Area of a square = $(\text{side})^2$

   $= (35.5)^2$

   = 1260.25 sq. cm

   ∴ Area of the square is 1260.25 sq. cm.

2. Side of the square = 48.2 cm

   Area of a square = $(\text{side})^2$

   $= (48.2)^2$

   = 2323.24 sq. cm

   ∴ Area of the square is 2323.24 sq. cm.

3. Side of the square = 27.5 m

   Area of a square = $(\text{side})^2$

   $= (27.5)^2$

   = 756.25 sq. m

   ∴ Area of the square is 756.25 sq. m.

4. Side of the square = 30.1 m

   Area of a square = $(\text{side})^2$

   $= (30.1)^2$

   = 906.01 sq. m

   ∴ Area of the square is 906.01 sq. m.

Exercise 68:

Solution 1:

Length of the plot, $l = 75.5$ m

Breadth of the plot, $b = 30.5$ m

Area of the plot $= l \times b$

$= 75.5 \times 30.5$

$= 2302.75$ sq. m

Rate per sq. m = Rs. 550

$\therefore$ Selling price of the plot = Rate x Area

= Rs. (550×2302.75)

= Rs. 1266512.50

Thus, the selling price of the plot is Rs. 1266512.50.

Solution 2:

Side of a square room = 6.5 m

Area of the floor (i.e., a square) = $(\text{side})^2$

$= (6.5)^2$

$= 42.25$ sq. m

Thus, the area of the floor of the room is 42.25 sq. m.

Solution 3:

Length of the bag, l = 36 cm
Breadth of the bag, b = 24 cm
Area of cloth required to make one bag = l x b
= 36 x 24
= 864 sq. cm
Length of the square piece of cloth = 3.6 m = 3.6 x 100 = 360 cm
∴ Area of the square piece of cloth = $(\text{side})^2$
= $(360)^2$
= 129600 sq. cm

$$\text{Now, number of bags which can be made} = \frac{\text{Area of the square piece of cloth}}{\text{Area of cloth for one bag}}$$

$$= \frac{129600}{864}$$
= 150

Thus, 150 bags can be made.

Solution 4:

Length of the pit, l = 2 m
Breadth of the pit, l = 2 m
Area of the pit =l × b = 2 × 2 = 4 sq. m
Length of the plot, l = 12.4 m,
Breadth of the plot, b = 10.2 m
Area of the plot = l × b = 12.4 × 10.2 = 126.48 sq. m
Now, area of the plot after the pit is dug = 126.48 − 4= 122.48 sq. m
Thus, the area of the plot after the pit is dug is 122.48 sq. m.

Solution 5:

Length of the floor, $l = 6.6\ m = 660\ cm$,
Breadth of the floor, $b = 4.5\ m = 450\ cm$
$\therefore$ Area of the floor $= l \times b = (660 \times 450)$ sq. cm

Side of the square tile = 30 cm,
$\therefore$ Area of the square tile $= (side)^2 = (30)^2 = (30 \times 30)$ sq. cm

$$\text{Now, number of tiles required} = \frac{\text{Area of thr floor}}{\text{Area of the square tile}}$$
$$= \frac{660 \times 450}{30 \times 30}$$
$$= 330$$

Thus, 330 tiles will be required.

Solution 6:

1. Part I is a rectangle with length $= (4.5 - 1) = 3.5$ cm and breadth $= 1$ cm
   $\therefore$ Area of part I = length $\times$ breadth
   $= 3.5 \times 1$
   $= 3.5$ sq. cm

2. Part II is a square with side length = 1 cm and breadth = 1 cm
   $\therefore$ Area of part II $= (side)^2$
   $= (1)^2$
   $= 1$ sq. cm

3. Part III is a rectangle with length = 6.5 cm and breadth = 1 cm
   $\therefore$ Area of part III = length $\times$ breadth
   $= 6.5 \times 1$
   $= 6.5$ sq. cm

4. Part IV is a rectangle with length = 6.5 cm and breadth $= (4.5 - 1) = 3.5$ cm
   $\therefore$ Area of part IV = length $\times$ breadth
   $= 6.5 \times 3.5$
   $= 22.75$ sq. cm

Exercise 69:

Solution 1:

Length of the rectangular garden = 120 m
Area of the rectangular garden = 7200 sq. m
Now, area of the rectangular garden = Length x Breadth
$\therefore$ 7200 = 120 x Breadth

$$\therefore \text{Breadth} = \frac{7200}{120}$$

$\therefore$ Breadth = 60 m
Thus, the breadth of the rectangular garden is 60 m.

Solution 2:

Length of the rectangle = 1.2 m
Area of the rectangle = 0.192 sq. m
Now, area of the rectangle = Length x Breadth
$\therefore$ 0.192 = 1.2 x Breadth

$$\therefore \text{Breadth} = \frac{0.192}{1.2}$$

$\therefore$ Breadth = 0.16 m
Thus, the breadth of the rectangle is 0.16 m.

Solution 3:

1. Length = 4.2 m, Area = 15.96 sq. m
   Now, Area = Length x Breadth
   ∴ 15.96 = 4.2 x Breadth
   ∴ Breadth = $\frac{15.96}{4.2}$ = 3.8 m

2. Breadth = 3.5 cm, Area = 33.95 sq. cm
   Now, Area = Length x Breadth
   ∴ 33.95 = Length x 3.5
   ∴ Length = $\frac{33.95}{3.5}$ = 9.7 cm

3. Length = 19.3 m, Area = 54.04 sq. m
   Now, Area = Length x Breadth
   ∴ 54.04 = 19.3 x Breadth
   ∴ Breadth = $\frac{54.04}{19.3}$ = 2.8 m

4. Length = 135.9 cm, Breadth = 4.5 cm
   Area = Length x Breadth = 135.9 x 4.5 = 611.55 sq. cm

5. Length = 11.6 m, Area = 58 sq. m
   Now, Area = Length x Breadth
   ∴ 58 = 11.6 x Breadth
   ∴ Breadth = $\frac{58}{11.6}$ = 5 m

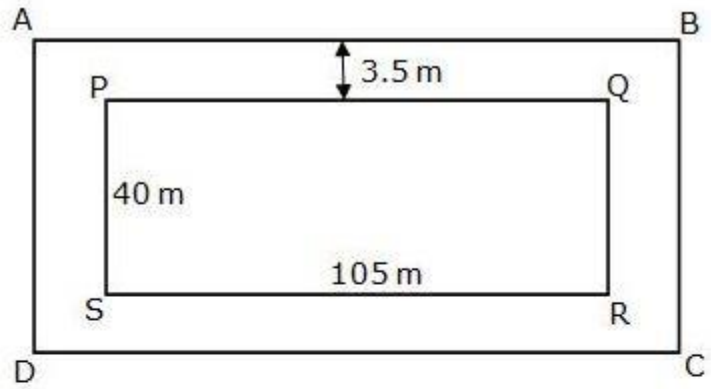
6. Breadth = 6 m, Area = 152.4 m
   Now, Area = Length x Breadth
   ∴ 152.4 = Length x 6
   ∴ Length = $\frac{152.4}{6}$ = 25.4 m

7. Length = 44.7 cm, Breadth = 1.5 cm
   Area = Length x Breadth = 44.7 x 1.5 = 67.05 sq. cm

S. No.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Length	4.2 m	9.7 cm	19.3 m	135.9 cm	11.6 m	25.4 m	44.7 cm
Breadth	3.8 m	3.5 cm	2.8 m	4.5 cm	5 m	6 m	1.5 cm
Area of rectangle	15.96 sq. m	33.95 sq. cm	54.04 sq. m	611.55 sq. cm	58 sq. m	152.4 sq. m	67.05 sq. cm

Exercise 70:

Solution 1:



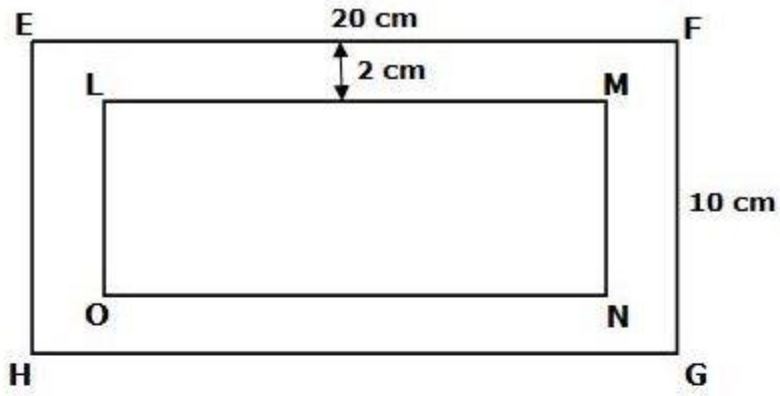
Suppose PQRS is a rectangular playground.
Leaving out the space taken by the path,
we get the figure ABCD which is also a rectangle.

For rectangle PQRS, l = 105 m, b = 40 m
Area of rectangle PQRS = l x b = 105 x 40 = 4200 sq. m

For rectangle ABCD,
l = (105 + 3.5 + 3.5) m = 112 m, b = (40 + 3.5 + 3.5) m = 47 m
Area of rectangle ABCD = l x b = 112 x 47 = 5264 sq. m

Now, area of the road = Area of rectangle ABCD – Area of rectangle PQRS
= (5264 – 4200) sq. m
= 1064 sq. m
Thus, the area of the road is 1064 sq. m.

Solution 2:



Suppose rectangle EFGH is a paper.
Leaving out a space 2 cm inside the paper for the coloured portion,
we get a rectangle LMNO.

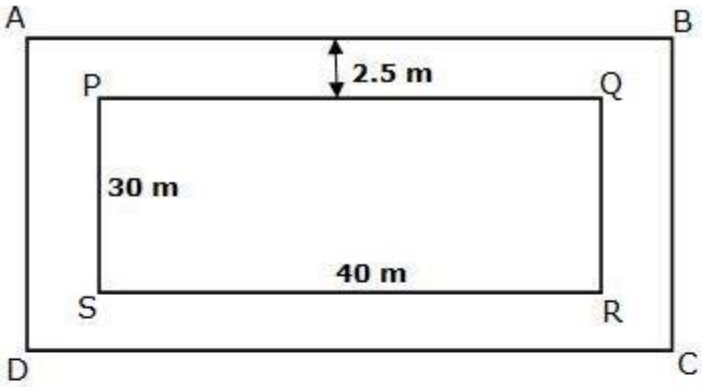
For rectangle EFGH, l = 20 cm, b = 10 cm
Area of rectangle EFGH = l x b = 20 x 10 = 200 sq. cm

For a rectangle LMNO,
l = (20 – 2 – 2) cm = 16 cm, b = (10 – 2 – 2) cm = 6 cm
Area of rectangle LMNO = l x b = 16 x 6 = 96 sq. cm

Now, area of coloured part = Area of rectangle EFGH – Area of rectangle LMNO
= (200 – 96) sq. cm
= 104 sq. cm
Thus, the area of the coloured portion is 104 sq. cm.

*The question has been modified as 'inside the sheet of paper' instead of 'along the sides of paper'.

Solution 3:



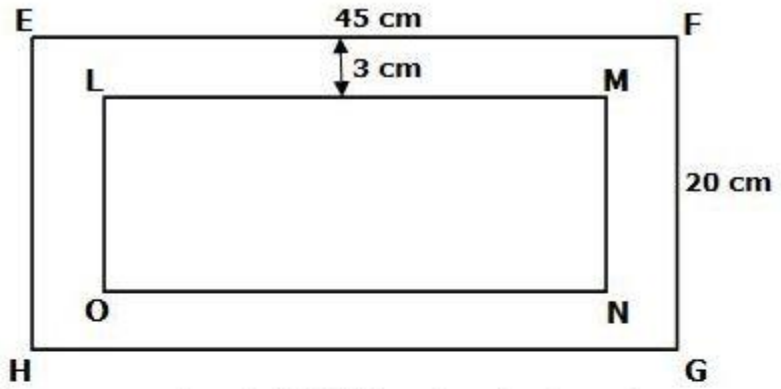
Suppose PQRS is a swimming pool.
Leaving out the space taken by the path,
we get the figure ABCD which is also a rectangle.

For rectangle PQRS, l = 40 m, b = 30 m
Area of rectangle PQRS = l x b = 40 x 30 = 1200 sq. m

For rectangle ABCD,
l = (40 + 2.5 + 2.5) m = 45 m, b = (30 + 2.5 + 2.5) m = 35 m
Area of rectangle ABCD = l x b = 45 x 35 = 1575 sq. m

Now, Area of the path = Area of rectangle ABCD – Area of rectangle PQRS
= (1575 – 1200) sq. m
= 375 sq. m
Thus, the area of the path is 375 sq. m.

Solution 4:



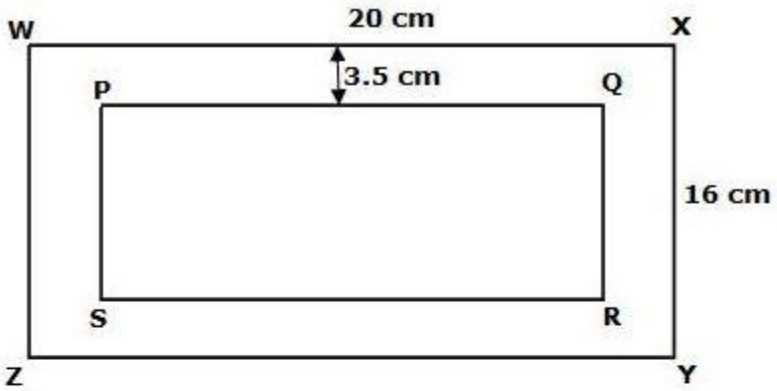
Suppose rectangle EFGH is a drawing board.
Leaving out a border of 3 cm inside the drawing board,
we get rectangle LMNO.

For rectangle EFGH, l = 45 cm, b = 20 cm
Area of rectangle EFGH = l x b = 45 x 20 = 900 sq. cm

For rectangle LMNO,
l = (45 – 3 – 3) cm = 39 cm, b = (20 – 3 – 3) cm = 14 cm
Area of rectangle LMNO = l x b = 39 x 14 = 546 sq. cm

Now, Area of border = Area of rectangle EFGH – Area of rectangle LMNO
= (900 – 546) sq. cm
= 354 sq. cm
Thus, the area of the border is 354 sq. cm.

Solution 5:



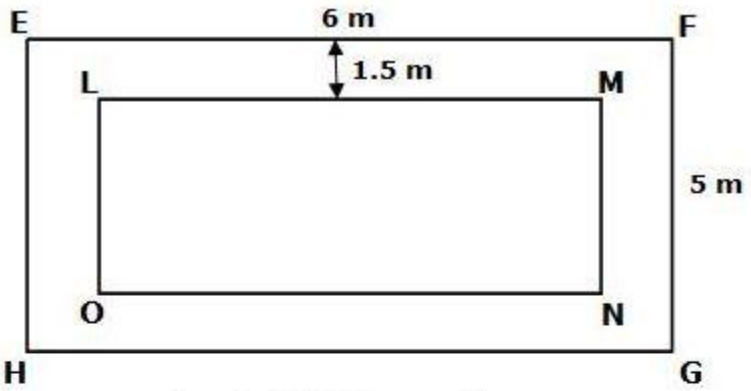
Suppose rectangle WXYZ is a board.
Leaving out a vacant strip of 3.5 cm inside the board,
we get rectangle PQRS.

For rectangle WXYZ, $l = 20$ cm, $b = 16$ cm
Area of rectangle WXYZ $= l \times b = 20 \times 16 = 320$ sq. cm

For rectangle PQRS,
$l = (20 - 3.5 - 3.5)$ cm $= 13$ cm, $b = (16 - 3.5 - 3.5)$ cm $= 9$ cm
Area of rectangle PQRS $= l \times b = 13 \times 9 = 117$ sq. cm

Now, Area of the strip = Area of rectangle WXYZ – Area of rectangle PQRS
$= (320 - 117)$ sq. cm
$= 203$ sq. cm
Thus, the area of the strip is 203 sq. cm.

Solution 6:



Suppose rectangle EFGH is a wall.
Leaving out a strip of 1.5 m along all four sides of the wall, we get rectangle LMNO.

For rectangle EFGH, $l = 6$ m, $b = 5$ m
Area of rectangle EFGH $= l \times b = 6 \times 5 = 30$ sq. m

For rectangle LMNO,
$l = (6 - 1.5 - 1.5)$ m $= 3$ m, $b = (5 - 1.5 - 1.5)$ m $= 2$ m
Area of rectangle LMNO $= l \times b = 3 \times 2 = 6$ sq. m

Now, area of the unpainted portion of the wall
= Area of rectangle EFGH – Area of rectangle LMNO
$= (30 - 6)$ sq. m
$= 24$ sq. m
Thus, the area of the unpainted portion of the wall is 24 sq. m.