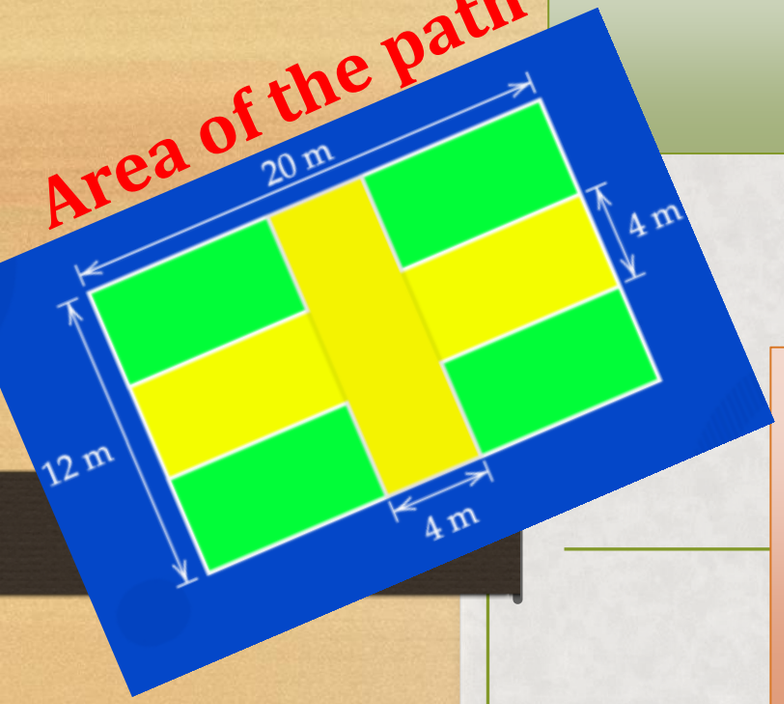
MAHARISHI VIDYA MANDIR – HYDERABAD

Area of the path



JAI GURU DEV

CLASS: VII

- MATHEMATICS

CH :18

- PERIMETER AND AREA

DAY-84

MODULE-3

TODAY'S LEARNING CONCEPTS

Previous day homework solutions ,
Solving Exercise: 18.2 (6^{th} to 8^{th} sum),
Area of paths with few examples .

RECAPITULATION

- Solved Ex: 18.1(8^{th} to 10th sum)
- Introduction to Area.
- Solving Exercise : 18.2 (1^{st} to 5^{th} sum)

Using the formulae of Area of rectangle, square and four walls of the room.

Previous day homework solutions

Exercise : 18.2

---

1)Find the area of the rectangle with the following dimensions:

b) l = 2m35cm , b= 1m10cm

l = 235cm, b= 110cm

Area of the rectangle = l x b

= 235 x 110

= 25850 sq.cm

Previous day homework solutions

4) The length and breadth of a rectangle are 0.3m and 12cm respectively. Find the area.

Sol: Length of a rectangle (l) = 0.3m

$= 0.3 \times 100 = 30$ cm

Breadth of a rectangle (b) = 12cm

Area of a rectangle = $l \times b$

$= 30 \times 12$

$= 360$ sq.cm

Previous day homework solutions

2) Find the area of the square with the following dimensions:

b)Side (s) = 240cm = 2.4m

Area of the square = s × s

= 2.4 × 2.4

= 5.76 sq.m

6) The area of a square park is the same as of a rectangular park. If the side of the square park is 40m and the length of the rectangular park is 80m,find the breadth of the rectangular park.

Sol:

Side of the square park = 40m

Area of the square park = s × s

= 40 ×40

Area of the square park = 1600sq.m

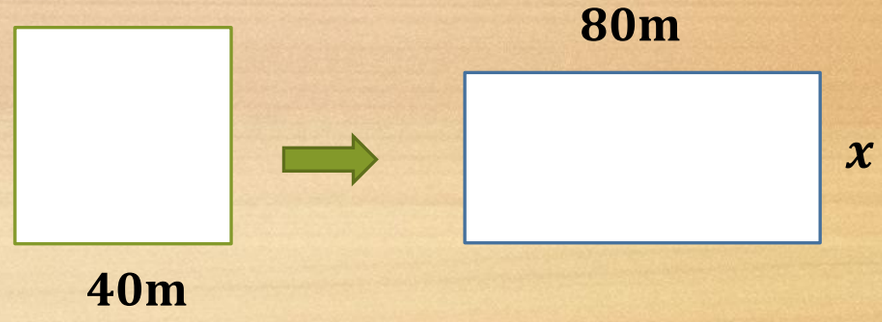
Given, Area of the square park = Area of the rectangle park

∴ Area of a rectangle = 1600sq.m

Length of a rectangle = 80m

Breadth $= \frac{area}{length} = \frac{1600}{80} =$ **20m**

∴ Breadth of a rectangle = 20m



7) The sides of a rectangle are in the ratio 3:2. If the area is 486sq.m, find the cost of fencing it at ₹ 40 per meter.

Sol: The sides of a rectangle are in the ratio $= 3:2$

Let the length be $3x$ & breadth be $2\ x$

Area of a rectangle $= 486$sq.m (given)

Area of a rectangle $= length \times$ breadth

$3\ x \times 2\ x = 486$

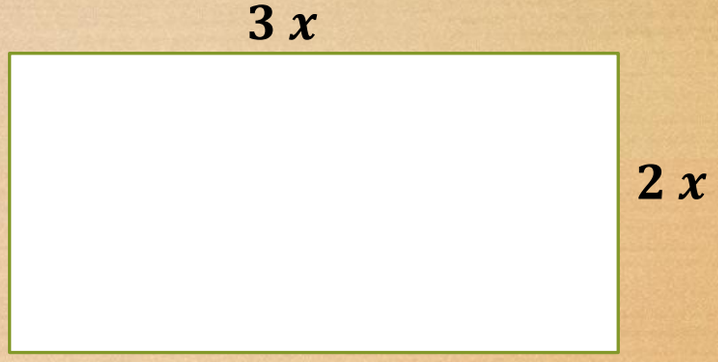
$6x^2 = 486$

$x^2 = 486/6$

$x^2 = 81$

$x = \sqrt{81} = \sqrt{9 \times 9}$

$x = 9$m



$\therefore Length(3x) = 3 \times 9 = 27\text{m}$, $\text{Breadth}(2x) = 2 \times 9 = 18\text{m}$

$Perimeter$ of a rectangle $= 2(l + \text{b})$

$= 2(27 + 18)$

$= 2 \times 45 = 90\text{m}$

Cost of fencing per meter $= ₹40$

Cost of fencing the rectangle $=$ perimeter $\times$ cost

$= 90 \times 40$

$\therefore$ Cost of fencing $= ₹3600$

8) The length and breadth of a rectangular piece of land are in the ratio of 4:3.If the total cost of fencing it at ₹10 per meter is ₹ 4200, find the length and breadth.

Sol: **The ratio of length & breadth of a rectangular piece of land = 4:3**

Let Length = $4x$ & Breadth = $3x$

Total cost of fencing at ₹10/m = ₹ 4200

$$\text{Perimeter} = 2(l + b)$$
$$= 2(4x + 3x)$$
$$= 2 \times 7x = 14x$$

Total cost of fencing at ₹10/m = ₹ 4200(given)

Total Cost of fencing = perimeter × cost

$$₹\ 4200 = 14x \times 10$$
$$14x = \frac{4200}{10}$$
$$x = 4200/140 = 30\text{m}$$

Length$(4x) = 4 \times 30 = 120\text{m}$,

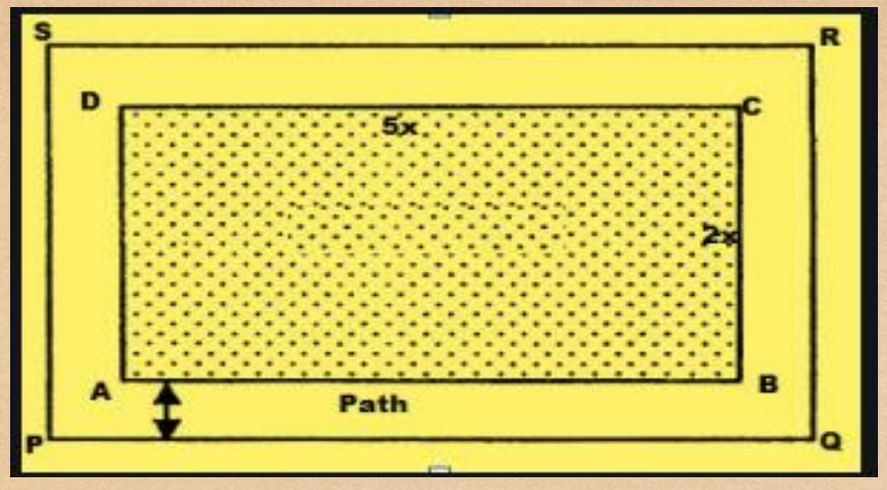
Breadth $(3x) = 3 \times 30 = 90\text{m}$

∴ The length and breadth of a rectangular piece of land = 120m and 90m

Note: Change the answer at the backside of the textbook 120m &90m

AREA OF THE PATHS

❖ **The figure shows a path around a central lawn ABCD. Given the dimensions of the lawn PQRS; and the width of the path, we can find the area of the path as follows:**



Area of the path = Area of PQRS (LB) – Area of ABCD(lb)

$PQ = AB + 2 \times$ width of the path

$RS = CD + 2 \times$ width of the path

AREA OF THE PATHS

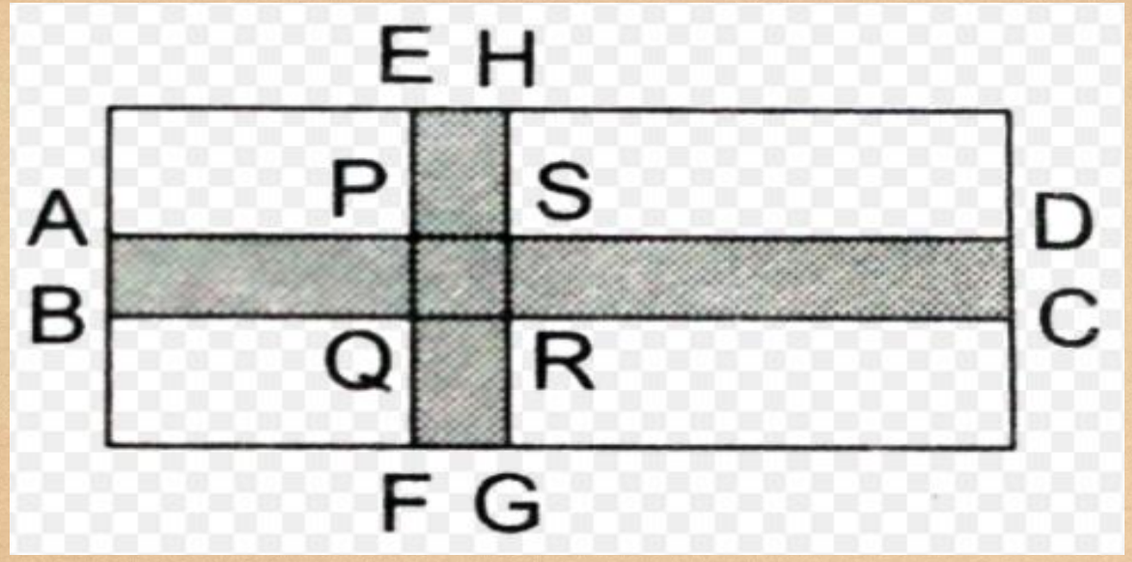
Area of rectangular pathway

Lets draw a rectangle within another rectangle with uniform width around it. area of the pathway is the area within outer rectangle but outside the inner rectangle.

Area of rectangular pathway = Area of outer rectangle — Area of inner rectangle

AREA OF THE PATHS

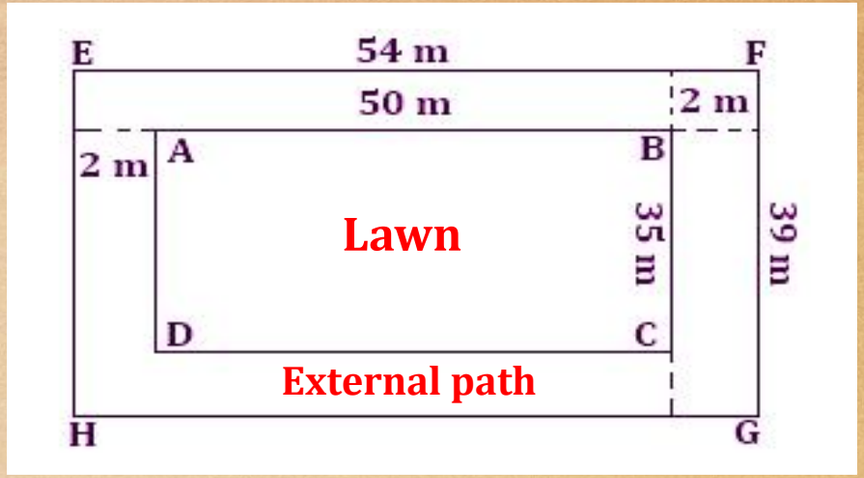
- The figure shows two crossing paths through a lawn. To calculate area of the path, we can separately calculate the areas EFGH and ABCD. Now , PQRS is common to both . We can find the area of the path as follows:



Area of the paths = Area of ABCD + Area of EFGH – Area of PQRS

EXAMPLE SUMS

EX:1 A rectangular lawn of length 50 m and breadth 35 m is to be surrounded externally by a path which is 2 m wide. Find the cost of turfing the path at the rate of ₹3 per m^2.



Sol: Length of the lawn $= 50$ m

Breadth of the lawn $= 35$ m

Area of the lawn ABCD $=$ length $\times$ breadth

$lb = (50 \times 35)\ m^2$

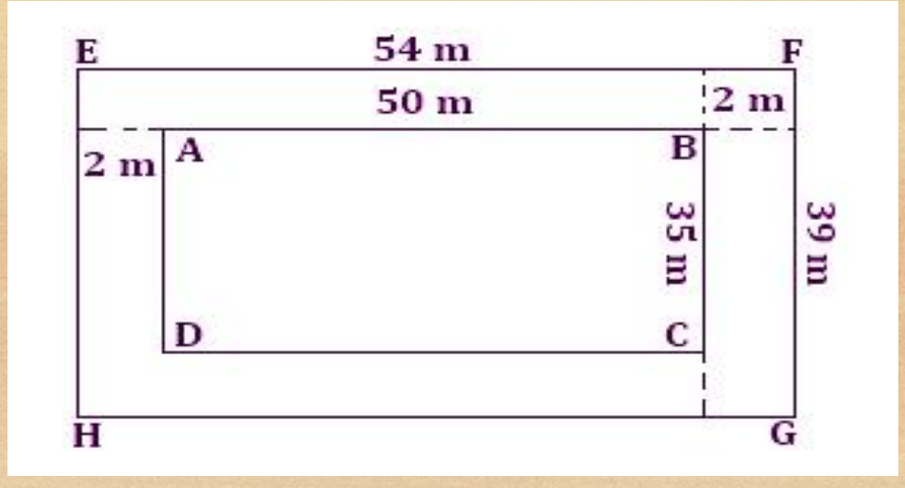
$= 1750\ m^2$

Length of lawn including the path $= [50 + (2 + 2)]$ m $= 54$m

Breadth of the lawn including the path $= [35 + (2 + 2)]$ m

$= 39$ m

EXAMPLE SUMS



Area of the lawn including the path EFGH = length × breadth

$$LB = 54 \times 39\ m^2$$

$$= 2106\ m^2$$

Therefore,

Area of the path= Area of the rectangle EFGH – Area of the rectangle ABCD

$$LB - lb = (2106 - 1750)\ m^2 = 356\ m^2$$

The cost of turfing the path for 1 m^2 = ₹ 3

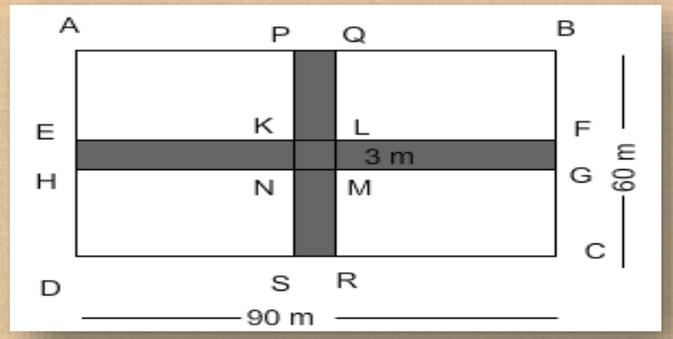
The cost of turfing the path for 356 m^2 = ₹3 × 356 = ₹1068

EXAMPLE SUMS

EX:2 Through a rectangular field of length 90 m and breadth 60 m, two roads are constructed which are parallel to the sides and cut each other at right angles through the centre of the fields. If the width of each road is 3 m, find

(i) the area of the path.

(ii) the cost of constructing the roads at the rate of ₹ 110 per m^2.



Solution: Given, Length of the rectangular field = 90m, Width of the rectangular field = 60m, Width of the road = 3m,

Cost of construction of road = ₹ 110 per m^2

Total area of rectangular field = Length × Width

$= 90 \times 60 = 5400\ m^2$

EXAMPLE SUMS

Area of the path PQRS = Length × Width

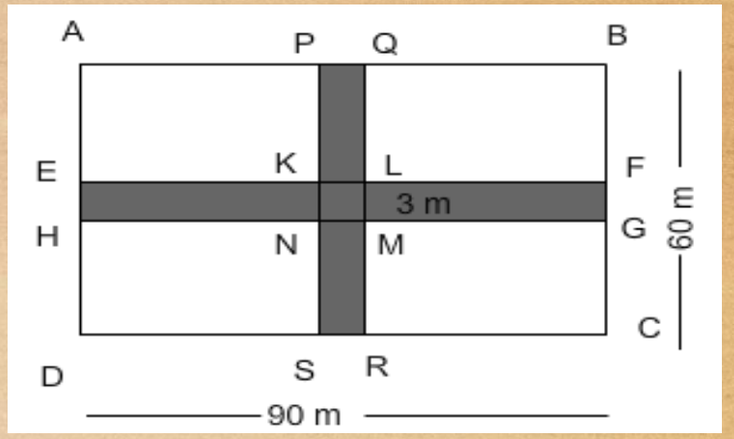
$= 60 \times 3 = 180\ m^2$

Area of the path EFGH = Length × Width

$= 90 \times 3 = 270\ m^2$

Area of the portion KLMN = Side × side

$= 3 \times 3 = 9m^2$



Therefore,

Area of the paths = Area of EFGH + Area of PQRS – Area of KLMN

$= 270 + 180 - 9$

Area of the paths $= 441m^2$

Cost of construction = Area × Rate

$= 441 \times ₹110 = ₹48510$

- **Solved Exercise: 18.2 (6^{th} to 8^{th} sum), Area of paths with few examples**

ORDER IS PRESENT EVERYWHERE

MAHARISHI VIDYA MANDIR – HYDERABAD

JAI GURU DEV