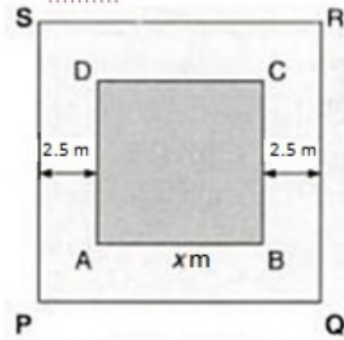




Exercise 20B



Let a side of the lawn (AB) be x m.

Area of the square lawn = x^2

Length, PQ = $(x \text{ m} + 2.5 \text{ m} + 2.5 \text{ m}) = (x + 5) \text{ m}$

\therefore Area of PQRS = $(x + 5)^2 = (x^2 + 10x + 25) \text{ m}^2$

Area of the path = Area of PQRS – Area of the square lawn (ABCD)

$$\Rightarrow 165 = x^2 + 10x + 25 - x^2$$

$$\Rightarrow 165 = 10x + 25$$

$$\Rightarrow 165 - 25 = 10x$$

$$\Rightarrow 140 = 10x$$

$$\therefore x = 140 \div 10 = 14$$

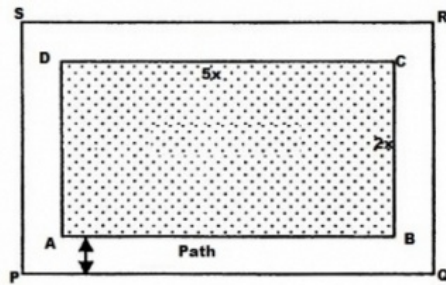
\therefore Side of the lawn = 14 m

$$\therefore \text{Area of the lawn} = (\text{Side})^2 = (14 \text{ m})^2 = 196 \text{ m}^2$$

Q10

Answer :

Area of the path = 305 m^2



Let the length of the park be $5x$ m and the breadth of the park be $2x$ m.

$$\therefore \text{Area of the rectangular park} = 5x \times 2x = 10x^2 \text{ m}^2$$

Width of the path = 2.5 m

$$\text{Outer length, } PQ = 5x \text{ m} + 2.5 \text{ m} + 2.5 \text{ m} = (5x + 5) \text{ m}$$

$$\text{Outer breadth, } QR = 2x + 2.5 \text{ m} + 2.5 \text{ m} = (2x + 5) \text{ m}$$

$$\text{Area of } PQRS = (5x + 5) \times (2x + 5) = (10x^2 + 25x + 10x + 25) = (10x^2 + 35x + 25) \text{ m}^2$$

$$\therefore \text{Area of the path} = [(10x^2 + 35x + 25) - 10x^2] \text{ m}^2$$

$$\Rightarrow 305 = 35x + 25$$

$$\Rightarrow 305 - 25 = 35x$$

$$\Rightarrow 280 = 35x$$

$$\Rightarrow x = 280 \div 35 = 8$$

$$\therefore \text{Length of the park} = 5x = 5 \times 8 = 40 \text{ m}$$

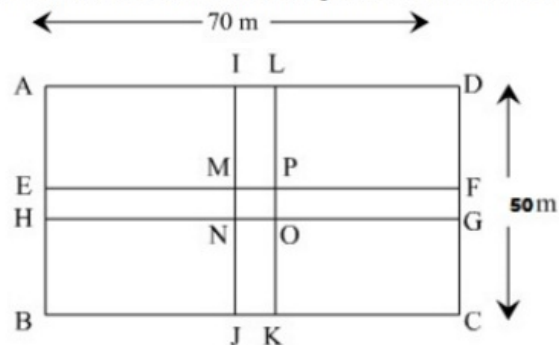
$$\text{Breadth of the park} = 2x = 2 \times 8 = 16 \text{ m}$$

Q11

Answer :

Let $ABCD$ be the rectangular park.

Let $EFGH$ and $IJKL$ be the two rectangular roads with width 5 m.



Length of the rectangular park, $AD = 70$ m

Breadth of the rectangular park, $CD = 50$ m

$$\therefore \text{Area of the rectangular park} = \text{Length} \times \text{Breadth} = 70 \text{ m} \times 50 \text{ m} = 3500 \text{ m}^2$$

$$\text{Area of road } EFGH = 70 \text{ m} \times 5 \text{ m} = 350 \text{ m}^2$$

$$\text{Area of road } IJKL = 50 \text{ m} \times 5 \text{ m} = 250 \text{ m}^2$$

Clearly, area of $MNOP$ is common to both the two roads.

$$\therefore \text{Area of } MNOP = 5 \text{ m} \times 5 \text{ m} = 25 \text{ m}^2$$

$$\text{Area of the roads} = \text{Area } (EFGH) + \text{Area } (IJKL) - \text{Area } (MNOP)$$

$$= (350 + 250) \text{ m}^2 - 25 \text{ m}^2 = 575 \text{ m}^2$$

It is given that the cost of constructing the roads is Rs. $120/\text{m}^2$.

$$\begin{aligned} \text{Cost of constructing } 575 \text{ m}^2 \text{ area of the roads} &= \text{Rs. } (120 \times 575) \\ &= \text{Rs. } 69000 \end{aligned}$$

Q12

Answer :

Let $ABCD$ be the rectangular field and $PQRS$ and $KLMN$ be the two rectangular roads with width 2 m and 2.5 m, respectively.

***** END *****

