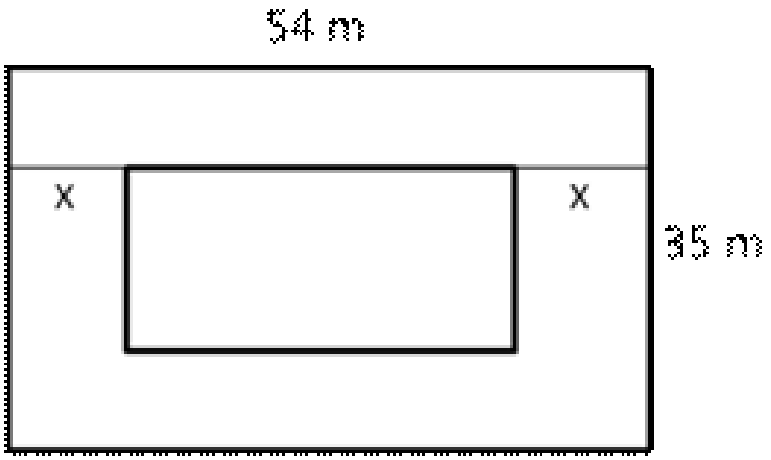
Exercise 17B

Question 14:
Let the length and breadth of a rectangular garden be 9x and 5x.



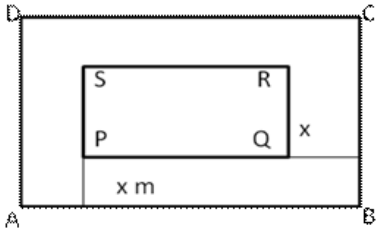
Then, area of garden = (9x × 5x) m^2 = 45 x^2m^2
Length of park excluding the path = (9x - 7) m
Breadth of the park excluding the path = (5x - 7) m
Area of the park excluding the path = (9x - 7)(5x - 7)

$$\text{Area of the path} = 45x^2 - (9x-7)(5x-7)$$
$$= 45x^2 - 45x^2 + 63x + 35x - 49$$
$$= 63x + 35x - 49$$
$$= (98x - 49)m^2$$
$$(98x - 49) = 1911$$
$$98x = 1911 + 49$$
$$\Rightarrow 98x = 1960 \Rightarrow x = \frac{1960}{98} = 20 \text{ m}$$

Length = 9x = 9 × 20 = 180 m
Breadth = 5x = 5 × 20 = 100 m
Hence, length = 180 m and breadth = 100 m

Question 15:
Area of carpet = (4.9 - 0.5) (3.5 - 0.5) m^2
= 4.4 × 3.0 = 13.2 m^2
Length of the carpet = 13.2/0.80 m = 16.5m
Cost of carpet = Rs. 40 per meter
Cost of 16.5 m carpet = Rs. (40 × 16.5) = Rs. 660

Question 16:
Let the width of the carpet = x meter



Area of floor ABCD = $(8 \times 5)\ m^2$

Area of floor PQRS without border

$= (8 - 2x)(5 - 2x)$

$= 40 - 16x - 10x + 4x^2$

$= 40 - 26x + 4x^2$

Area of border = Area of floor ABCD - Area of floor PQRS

$= [40 - (40 - 26x + 4x^2)]\ m^2$

$=[40 - 40 + 26x - 4x^2]\ m^2$

$= (26x - 4x^2)\ m^2$

$$\therefore \quad (26x - 4x^2) = 12$$

$$\Rightarrow \quad 26x - 4x^2 - 12 = 0$$

$$\Rightarrow \quad -4x^2 + 26x - 12 = 0$$

$$\Rightarrow \quad 2x^2 - 13x + 6 = 0$$

$$\Rightarrow \quad 2x^2 - 12x - x - 6 = 0$$

$$\Rightarrow \quad 2x(x - 6) - 1(x - 6) = 0$$

$$\Rightarrow \quad (2x - 1)(x - 6) = 0$$

$$\Rightarrow \quad x = \frac{1}{2} \text{ or } x = 6$$

$$\text{Width} = \frac{1}{2}\text{m} = 0.5\text{m} \left[\begin{array}{l}\text{Neglect } x = 6 \text{ because} \\ \text{width is not more than breadth}\end{array}\right]$$

$$\text{Width} = (0.5 \times 100)\text{ cm} = 50\text{ cm}$$

********** END **********