

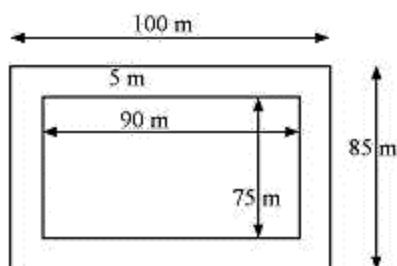
Board – CBSE

Class – 7th

Topic – Perimeter and Area 11.4

**Q.1** A garden is 90 m long and 75 m broad. A path 5 m wide is to be built outside and around it. Find the area of the path. Also find the area of the garden in hectare.

**Sol:**



Length (l) of garden = 90 m

Breadth (b) of garden = 75 m

Area of garden =  $l \times b = 90 \times 75 = 6750 \text{ m}^2$

From the figure, it can be observed that the new length and breadth of the garden, when path is also included, are 100m and 85m respectively.

Area of the garden including the path =  $100 \times 85 = 8500 \text{ m}^2$

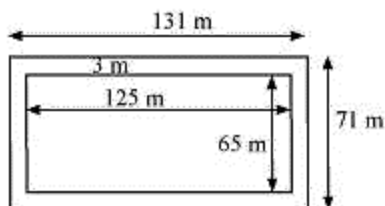
Area of path = Area of the garden including the path – Area of garden =  $8500 - 6750 = 1750 \text{ m}^2$

1 hectare =  $10000 \text{ m}^2$

Therefore, area of garden in hectare =  $\frac{6750}{10000} = 0.675$  hectare

**Q.2** A 3 m wide path runs outside and around a rectangular park of length 125 m and breadth 65 m. Find the area of the path.

**Sol:**



Length (l) of park = 125 m

Breadth (b) of park = 65 m

$$\text{Area of park} = l \times b = 125 \times 65 = 8125 \text{ m}^2$$

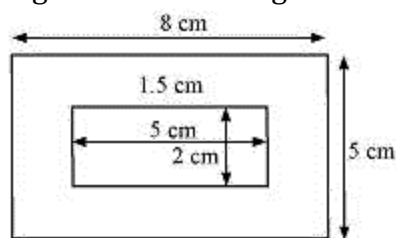
From the figure, it can be observed that the new length and breadth of the park, when path is also included, are 131 m and 71 m respectively.

$$\text{Area of the park including the path} = 131 \times 71 = 9301 \text{ m}^2$$

$$\text{Area of path} = \text{Area of the park including the path} - \text{Area of park} = 9301 - 8125 = 1176 \text{ m}^2$$

**Q.3** A picture is painted on a cardboard 8 cm long and 5 cm wide such that there is a margin of 1.5 cm along each of its sides. Find the total area of the margin.

**Sol:**



$$\text{Length (l) of cardboard} = 8 \text{ cm}$$

$$\text{Breadth (b) of cardboard} = 5 \text{ cm}$$

$$\text{Area of cardboard including margin} = l \times b = 8 \times 5 = 40 \text{ cm}^2$$

From the figure, it can be observed that the new length and breadth of the cardboard, when margin is not included, are 5 cm and 2 cm respectively.

$$\text{Area of the cardboard not including the margin} = 5 \times 2 = 10 \text{ cm}^2$$

$$\text{Area of the margin} = \text{Area of cardboard including the margin} - \text{Area of cardboard not including the margin}$$

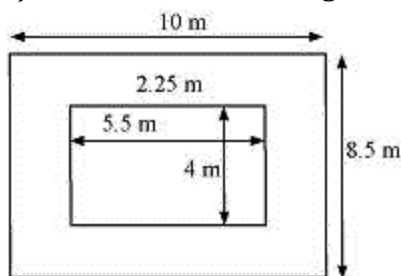
$$\text{Area of the margin} = 40 - 10 = 30 \text{ cm}^2$$

**Q.4** A verandah of width 2.25 m is constructed all along outside a room which is 5.5 m long and 4 m wide. Find:

(i) The area of the verandah

(ii) The cost of cementing the floor of the verandah at the rate of Rs 200 per  $\text{m}^2$ .

**Sol:**



(i) Length (l) of room = 5.5 m

Breadth (b) of room = 4 m

Area of room =  $l \times b = 5.5 \times 4 = 22 \text{ m}^2$

From the figure, it can be observed that the new length and breadth of the room, when verandah is also included, are 10 m and 8.5 m respectively.

Area of the room including the verandah =  $10 \times 8.5 = 85 \text{ m}^2$

Area of verandah = Area of the room including the verandah – Area of room =  $85 - 22 = 63 \text{ m}^2$

(ii) Cost of cementing  $1 \text{ m}^2$  area of the floor of the verandah = Rs 200

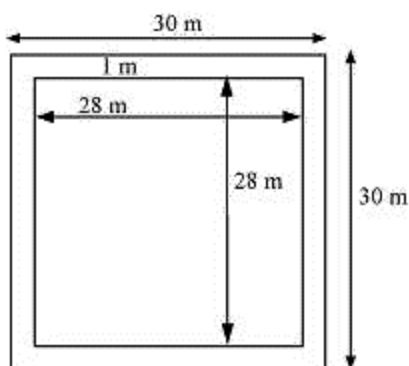
Cost of cementing  $63 \text{ m}^2$  area of the floor of the verandah =  $200 \times 63 = \text{Rs } 12600$

**Q.5** A path 1 m wide is built along the border and inside a square garden of side 30 m.  
Find:

(i) The area of the path

(ii) The cost of planting grass in the remaining portion of the garden at the rate of Rs 40 per  $\text{m}^2$ .

**Sol:**



(i) Side (a) of square garden = 30 m

Area of square garden including path =  $a^2 = (30)^2 = 900 \text{ m}^2$

From the figure, it can be observed that the side of the square garden, when path is not included, is 28 m.

Area of the square garden not including the path =  $(28)^2 = 784 \text{ m}^2$

Area of path = Area of the square garden including the path – Area of square garden not including the path

$$= 900 - 784 = 116 \text{ m}^2$$

(ii) Cost of planting grass in  $1 \text{ m}^2$  area of the garden = Rs 40

Cost of planting grass in  $784 \text{ m}^2$  area of the garden =  $784 \times 40 = \text{Rs } 31360$ .

**Q.6** Two cross roads, each of width 10 m, cut at right angles through the centre of a rectangular park of length 700 m and breadth 300 m and parallel to its sides. Find the area of the roads. Also find the area of the park excluding cross roads. Give the answer in hectares.

**Sol:** Length (l) of park = 700 m

Breadth (b) of park = 300 m

Area of park =  $700 \times 300 = 210000 \text{ m}^2$

Length of road PQRS = 700 m

Length of road ABCD = 300 m

Width of each road = 10 m

Area of the roads = ar (PQRS) + ar (ABCD) – ar (KLMN)

$$= (700 \times 10) + (300 \times 10) - (10 \times 10)$$

$$= 7000 + 3000 - 100$$

$$= 10000 - 100 = 9900 \text{ m}^2 = 0.99 \text{ hectare}$$

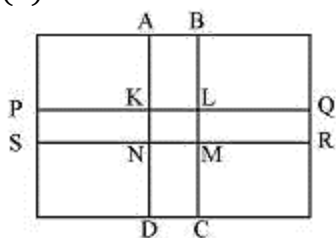
Area of park excluding roads =  $210000 - 9900 = 200100 \text{ m}^2 = 20.01 \text{ hectare}$ .

**Q.7** 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 covered by the roads.

(ii) The cost of constructing the roads at the rate of Rs 110 per  $\text{m}^2$ .

**Sol:**



Length (l) of field = 90 m

Breadth (b) of field = 60 m

Area of field =  $90 \times 60 = 5400 \text{ m}^2$

Length of road PQRS = 90 m

Length of road ABCD = 60 m

Width of each road = 3 m

Area of the roads = ar (PQRS) + ar (ABCD) – ar (KLMN)

=  $(90 \times 3) + (60 \times 3) - (3 \times 3)$

=  $270 + 180 - 9 = 441 \text{ m}^2$

Cost for constructing  $1 \text{ m}^2$  road = Rs 110

Cost for constructing  $441 \text{ m}^2$  road =  $110 \times 441 = \text{Rs } 48510$

- Q.8** Pragma wrapped a cord around a circular pipe of radius 4 cm (adjoining figure) and cut off the length required of the cord. Then she wrapped it around a square box of side 4 cm (also shown). Did she have any cord left? ( $\pi = 3.14$ ).



**Sol:** Perimeter of the square =  $4 \times \text{Side of the square} = 4 \times 4 = 16 \text{ cm}$

Perimeter of circular pipe =  $2\pi r = 2 \times 3.14 \times 4 = 25.12 \text{ cm}$

Length of chord left with Pragma =  $25.12 - 16 = 9.12 \text{ cm}$ .

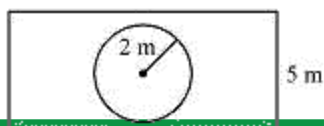
- Q.9** The adjoining figure represents a rectangular lawn with a circular flower bed in the middle. Find:

(i) The area of the whole land

(ii) The area of the flower bed

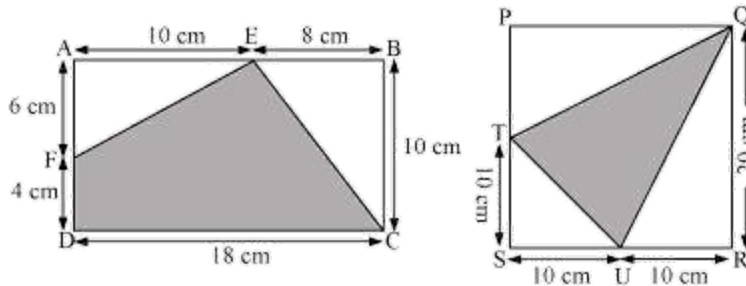
(iii) The area of the lawn excluding the area of the flower bed

(iv) The circumference of the flower bed.



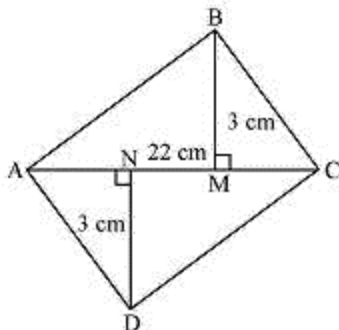
- Sol:** (i) Area of whole land = Length  $\times$  Breadth =  $10 \times 5 = 50 \text{ m}^2$   
 (ii) Area of flower bed =  $\pi r^2 = 3.14 \times 2 \times 2 = 12.56 \text{ m}^2$   
 (iii) Area of lawn excluding the flower bed = Area of whole land – Area of flower bed  
 =  $50 - 12.56 = 37.44 \text{ m}^2$   
 (iv) Circumference of flower bed =  $2\pi r = 2 \times 3.14 \times 2 = 12.56 \text{ m}$ .

**Q.10** In the following figures, find the area of the shaded portions:



- Sol:** (i) Area of EFDC = ar (ABCD) – ar (BCE) – ar (AFE)  
 =  $(18 \times 10) - \frac{1}{2} (10 \times 8) - \frac{1}{2} (6 \times 10)$   
 =  $180 - 40 - 30 = 110 \text{ cm}^2$   
 (ii) ar (QTU) = ar (PQRS) – ar (TSU) – ar (RUQ) – ar (PQT)  
 =  $(20 \times 20) - \frac{1}{2} (10 \times 10) - \frac{1}{2} (20 \times 10) - \frac{1}{2} (20 \times 10)$   
 =  $400 - 50 - 100 - 100 = 150 \text{ cm}^2$

**Q.11** Find the area of the quadrilateral ABCD. Here, AC = 22 cm, BM = 3 cm, DN = 3 cm, and  $BM \perp AC$ ,  $DN \perp AC$



**Sol:**  $\text{ar (ABCD)} = \text{ar (ABC)} + \text{ar (ADC)} = (3 \times 22) + (3 \times 22)$   
 $= 33 + 33 = 66 \text{ cm}^2$