



Chapter 11

Perimeter and Area

SOLUTIONS:

Exercise 11.1

Q1. The length and breadth of a rectangular piece of land are 500 m and 300m respectively . Find (i) its area (ii) the cost of the land if 1 m² of land costs Rs 10,000.

Ans : (i) Area = length × breadth

$$= 500 \text{ m} \times 300 \text{ m}$$

$$= 150000 \text{ m}^2.$$

(ii) cost of the land = area × rate

$$= 150000 \times 10000$$

$$= \text{Rs } 1500000000.$$

Q2. Find the area of a square park whose perimeter is 320 m.

Ans : length of side = perimeter ÷ 4

$$= 320 \div 4$$

$$= 80 \text{ m.}$$

Area of the square = side × side

$$= 80\text{m} \times 80\text{m}$$

$$= 6400 \text{ m}^2.$$

Q3. Find the breadth of a rectangular plot of land if its area is 440 m^2 and the length is 22 m . Also find its perimeter.

Ans : Area of rectangle = length \times breadth

$$\text{Or } 440 \text{ m}^2 = 22 \text{ m} \times \text{breadth}$$

$$\text{Or } \frac{440}{22} \text{ m} = \text{breadth}$$

$$\text{Or } 20 \text{ m} = \text{breadth.}$$

$$\begin{aligned} \text{Perimeter of the rectangle} &= 2 \times (l + b) \\ &= 2 \times (22 + 20) \text{ m} \\ &= 2 \times 42 \text{ m} \\ &= 84 \text{ m.} \end{aligned}$$

Q4. The perimeter of a rectangular sheet is 100 cm . If the length is 35 cm , find its breadth. Also the area.

Ans : Perimeter = $2 \times (l + b)$

$$\text{Or } 100 = 2 \times (35 + b)$$

$$\text{Or } \frac{100}{2} = 35 + b$$

$$\text{Or } 50 - 35 = b$$

$$\text{Or } 15 \text{ m} = \text{breadth.}$$

$$\text{Therefore, Area} = 35 \text{ m} \times 15 \text{ m} = 525 \text{ m}^2$$

Q5. The area of a square park is the same as of a rectangular park. If the side of the square park is 60 m and the length of the rectangular park is 90 m , find the breadth of the rectangular park.

Ans : Area of the rectangular park = area of the square park (given)

$$\text{Length} \times \text{Breadth} = \text{side} \times \text{side}$$

$$\text{Or } 90 \times \text{breadth} = 60 \times 60$$

$$\text{Or } \text{breadth} = \frac{3600}{90} \text{ m} = 40 \text{ m.}$$

Q6. A wire is in the shape of a rectangle . Its length is 40cm and breadth is 22cm . If the same wire is rebent in the shape of a square , what will be the measure of each side?

Ans :

$$\begin{aligned} \text{Length of the wire} &= \text{perimeter of the rectangle} = 2 \times (l + b) \\ &= 2 \times (40 + 22) \\ &= 2 \times 62 \\ &= 124\text{m} \end{aligned}$$

Perimeter of the square = length of the wire = 124 m

(same wire is making the square and the rectangle)

$4 \times \text{side of a square} = \text{perimeter of the square.}$

$$\text{Or side of the square} = \frac{124}{4} \text{ m} = 31 \text{ m.}$$

Now, area of the rectangle = $l \times b = 40 \text{ m} \times 22 \text{ m} = 880 \text{ m}^2$

Area of the square = $\text{side} \times \text{side} = 31\text{m} \times 31\text{m} = 961 \text{ m}^2 .$

Therefore the square has more area than the rectangle.

Q7. The perimeter of a rectangle is 130 cm . If the breadth of the rectangle is 30 cm , find its length . Also find the area of the rectangle .

Ans : Perimeter of a rectangle = $2 \times (l + b)$

$$\text{Or } 130 = 2 \times (l + 30)$$

$$\text{Or } \frac{130}{2} = l + 30$$

$$\text{Or } 65 - 30 = \text{length}$$

$$\text{Or } 35 = \text{length.}$$

Area of the rectangle = length \times breadth

$$= 35\text{m} \times 30 \text{ m} = 1050 \text{ m}^2$$

Q8. A door of length 2m and breadth 1m is fitted in a wall . The length of the wall is 4.5 m and the breadth is 3.6m . Find the cost of white washing the wall, if the rate of white washing the wall is Rs 20 per m² .

Ans : Area of the rectangular door = 2m × 1m = 2 m² .

Area of the rectangular wall = 4.5 m × 3.6 m = 16.20 m² .

Area of the wall for white washing = 16.20m – 2m = 14. 20m.

Cost of white washing = Area × Rate.

$$= 14.20 \times 20$$

$$= \text{Rs } 284$$



मंत्रालय
DEPARTMENT OF EDUCATION (S)
Government of Manipur

Exercise 11.2

Q1. Find the area of each of the following parallelograms :

(a) Base = 7cm and height = 4cm

Soln : Area = base X height = $7 \times 4 = 28 \text{ cm}^2$.

(b) Base = 5cm and Height = 3cm

Soln: area = $5 \times 3 = 15 \text{ cm}^2$

(c) Base = 2.5cm and Height = 3.5cm

soln. Area = $2.5 \times 3.5 = 8.75 \text{ cm}^2$

(d) Base = 5cm and Height = 4.8cm

Soln : area = $5 \times 4.8 = 24 \text{ cm}^2$

(e) Base = 2cm and Height = 4.4cm

soln: area = $2 \times 4.4 = 8.8 \text{ cm}^2$

Q2. Find the area of each of the following triangles:

(a) Base = 4cm and Height = 3cm

Soln : area = $\frac{1}{2} \times \text{base} \times \text{height}$

$$= \frac{1}{2} \times 4 \times 3$$

$$= 6 \text{ cm}^2$$

(b) Base = 5cm and Height = 3.2cm

soln : area = $\frac{1}{2} \times 5 \times 3.2$

$$= 8 \text{ cm}^2$$

(c) Base = 3cm and Height = 4cm

Soln : Area = $\frac{1}{2} \times 3 \times 4$

$$= 6 \text{ cm}^2$$

(d) Base = 3cm and Height = 2cm

Soln: area = $\frac{1}{2} \times 3 \times 2$

$$= 3 \text{ cm}^2$$

Q3 Find the missing values :

| Sl no. | Base | Height | Area of parallelogram |
|--------|---------------|----------------|-----------------------|
| a | 20 cm | 12.3cm | 246 cm^2 |
| b | 10.3cm | 15 cm | 154.5 cm^2 |
| c | 5.8cm | 8.4 cm | 48.72 cm^2 |
| d | 15.6 cm | 1.05 cm | 16.38 cm^2 |

Q4 . Find the missing value :

| Base | Height | Area of triangle |
|-------------|----------------|----------------------|
| 15 cm | 11.6 cm | 87 cm ² |
| 80mm | 31.4 mm | 1256mm ² |
| 22cm | 15.5cm | 170.5cm ² |

Q5. PQRS is a parallelogram . QM is the height from Q to SR and QN is the height from Q to PS . If SR = 12cm and QM = 7.6 cm. Find :

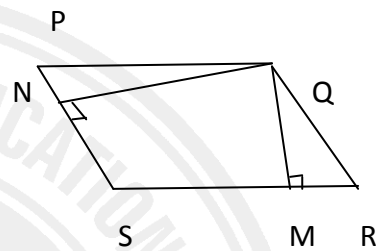
Ans : (a) area of the parallelogram = base X height = SR X QM = 12 X 7.6 = 91.2 cm²

(b) area of PQRS = 91.2

Or PS x QN = 91.2

Or 12 X QN = 91.2

Or QN = 91.2 ÷ 12 = 7.6 cm



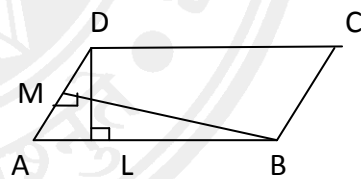
Q6. DL and BM are the heights on the sides AB and AD respectively of parallelogram ABCD . IF the area of the parallelogram is 1470 cm² , AB = 35 cm and AD = 49 cm , find the length of BM and DL.

Ans : Area of ABCD = 1470

Or AB x DL = 1470

Or 35 X DL = 1470

Or DL = 1470 ÷ 35 = 42 cm



Area of ABCD = 1470

Or AD X BM = 1470

Or 49 X BM = 1470

Or BM = 1470 ÷ 49 = 30 cm



DEPARTMENT OF EDUCATION (S)
Government of Manipur

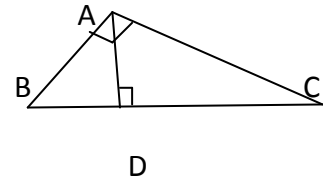
Q7. $\triangle ABC$ is right angled at A . AD is perpendicular to BC . If AB = 5 cm , BC = 13 cm and AC = 12 cm . Find the area of $\triangle ABC$. Also find the length of AD .

Soln : Area of $\triangle ABC$ = area of rt. $\triangle ABC$

Or $\frac{1}{2} \times BC \times AD = \frac{1}{2} \times AB \times AC$

Or $13 \times AD = 5 \times 12$

Or $AD = (5 \times 12) \div 13 = \frac{60}{13} \text{cm.}$



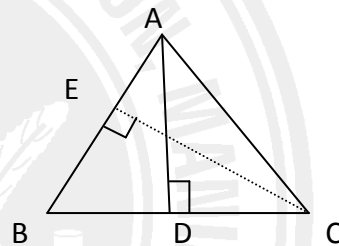
Q8. $\triangle ABC$ is isosceles with AB = AC = 7.5 cm and BC = 9 cm . The height AD from A to BC is 6 cm . Find the area of $\triangle ABC$. What will be the height from C to AB i.e CE ?
Soln :

Area of $\triangle ABC$ = Area of $\triangle ABC$

Or $\frac{1}{2} \times AB \times CE = \frac{1}{2} \times BC \times AD$

Or $7.5 \times CE = 9 \times 6$

Or $CE = 54 \div 7.5 = 7.2 \text{ cm.}$



EXERCISE 11.3

Q1. Find the circumference of the circles with the following radius :

Ans : (a) circumference = $2 \times \frac{22}{7} \times 14 = 88$ cm

(b) circumference = $2 \times \frac{22}{7} \times 28 = 176$ mm

(c) circumference = $2 \times \frac{22}{7} \times 21 = 132$ cm

Q2 . Find the area of the following circles :

Ans : (a) area = $\frac{22}{7} \times 14 \times 14 = 616$ mm²

(b) area = $\frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} = 1886.5$ m²

(c) area = $\frac{22}{7} \times 5 \times 5 = \frac{550}{7}$ cm²

Q3. If the circumference of a circular sheet is 154 m , find its radius . also find the area of the sheet

Ans : circumference = 154

Or $2 \times \frac{22}{7} \times r = 154$

Or radius = $\frac{154 \times 7}{22 \times 2} = 24.5$ m

Area of the sheet = $\frac{22}{7} \times 24.5 \times 24.5 = 1886.5$ m² .

Q4. A gardener wants to fence a circular garden of diameter 21 m . Find the length of the rope he needs to purchase if he makes 2 rounds of fence . Also find the cost of the rope if it cost Rs 4 per metre.

Ans : length of the rope = $2 \times$ circumference of the garden = $2 \times \frac{22}{7} \times 21 = 132$ m.

Cost of the rope = length of the rope x rate . = $132 \times 4 =$ Rs 528

Q5. From a circular sheet of radius 4 cm, a circle of radius 3 cm is removed. Find the area of the remaining sheet.

Ans : Area of circle with radius 4 cm = $3.14 \times 4 \times 4 = 50.24 \text{ cm}^2$

Area of circle with radius 3 cm = $3.14 \times 3 \times 3 = 28.26 \text{ cm}^2$

Area of the remaining sheet = $50.24 - 28.26 = 21.98 \text{ cm}^2$

Q6. Saima wants to put a lace on the edge of a circular table cover of diameter 1.5 m. Find the length of the lace required and also find its cost if one meter of lace cost Rs 15.

Ans ; length of the lace required = circumference = $\pi \times \text{diameter} = 3.14 \times 1.5 = 4.71 \text{ m}$

Cost of the lace = length x Rate = $4.71 \times 15 = \text{Rs } 70.65$

Q7. Find the perimeter of the adjoining figure, which is a semicircle including its diameter.

Ans : perimeter = $10 + \frac{1}{2} \times 3.14 \times 10 = 25.7 \text{ cm}$

Q8. Find the cost of polishing a circular table top of diameter 1.6 m, if the rate of polishing is RS 15 per m^2 .

Ans : area of the table top = $\pi \times r \times r = 3.14 \times 0.8 \times 0.8 = 2.0096 \text{ m}^2$.

Cost of polishing = area x rate = $2.0096 \times 15 = \text{Rs } 30.144$

Q9. Shazli took a wire of length 44cm and bent it into the shape of a circle. Find the radius of that circle. Also find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area, the circle or the square?

Ans : circumference of the circle = length of the wire

Or $2 \times \frac{22}{7} \times r = 44$

Or $r = \frac{44 \times 7}{2 \times 22} = 7 \text{ cm}$.

Area of the circle = $\pi \times r \times r = \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$.

Perimeter of the square = length of the wire

Or $4 \times \text{side of square} = 44$

Or side of square = $44 \div 4 = 11\text{cm}$

Area of the square = side \times side = $11 \times 11 = 121 \text{ cm}^2$

Thus the circle encloses more area.

Q10. From a circular card sheet of radius 14 cm, two circles of radius 3.5 cm and a rectangle of length 3cm and breadth 1 cm are removed. Find the area of the remaining sheet. π

Ans: Area of the circle with radius 14cm. = $\frac{22}{7} \times 14 \times 14 = 616 \text{ cm}^2$

Area of the two circles with radius 3.5 cm = $2 \times \frac{22}{7} \times 3.5 \times 3.5 = 77 \text{ cm}^2$

Area of the rectangle = length \times breadth = $3 \times 1 = 3 \text{ cm}^2$.

Area of the remaining sheet = $616 - 77 - 3 = 536 \text{ cm}^2$

Q11. A circle of radius 2 cm is cut out from a square piece of an aluminium sheet of side 6 cm. What is the area of the left over aluminium sheet?

Ans: Area of the square = side \times side = $6 \times 6 = 36 \text{ cm}^2$.

Area of the circle = $\pi \times r \times r = 3.14 \times 2 \times 2 = 12.56 \text{ cm}^2$

Area of the remaining sheet = $36 - 12.56 = 23.44 \text{ cm}^2$.

Q12. The circumference of a circle is 31.4 cm. Find the radius and area of the circle.

Ans: circumference of circle = 31.4

Or $2 \times \pi \times r = 31.4$

Or $2 \times 3.14 \times r = 31.4$

Or radius, $r = \frac{31.4}{2 \times 3.14} = 5 \text{ cm}$

Area of the circle = $\pi r^2 = 3.14 \times 5 \times 5 = 78.5 \text{ cm}^2$.

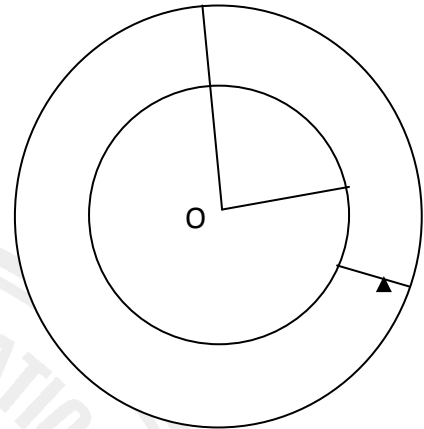
Q13. A circular flower bed is surrounded by a path 4m wide . The diameter of the flower bed is 66 m . what is the area of this path ?

Ans:

$$\text{Radius of inner circle} = 66 / 2 = 33 \text{ m}$$

$$\text{Width of the path} = 4\text{m}$$

$$\text{Radius of the outer circle} = 33 + 4 = 37\text{m}$$



$$\begin{aligned} \text{Area of the path} &= \text{area of outer circle} - \text{area of inner circle} = 3.14 \times 37 \times 37 - 3.14 \times 33 \times 33 \\ &= 4298.66 - 3419.46 = 879.2\text{m}^2. \end{aligned}$$

Q14. A circular flower garden has an area of 314 m^2 . A sprinkler water at the centre of the garden can cover an area that has a radius of 12 m . Will the sprinkler water the entire garden?

Ans

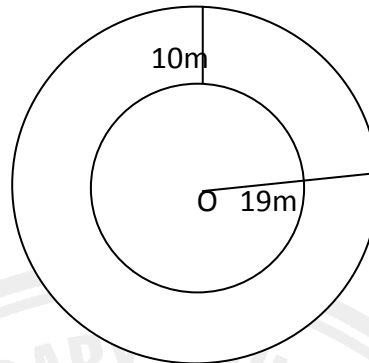
$$\begin{aligned} \text{Area of the circular garden} &= 314 \text{ m}^2 \\ \text{Or} \quad 3.14 \times r^2 &= 314 \\ \text{Or} \quad r^2 &= 314 \div 3.14 = 100 = 10^2 \\ \text{Or} \quad \text{radius, } r &= 10 \text{ which is less than } 12\text{m}. \end{aligned}$$

Therefore the sprinkler can water the entire garden.



Q15. Find the circumferences of the inner and outer circles shown in the adjoining figure .

Ans:



$$\text{Circumference of the outer circle} = 2 \times 3.14 \times 19 = 119.32 \text{ m}$$

$$\text{Circumference of the inner circle} = 2 \times 3.14 \times 9 = 56.52 \text{ m}$$

Q16. How many times a wheel of radius 28cm must rotate to go 352 m?

$$\text{Ans: circumference of the wheel} = 2 \times \frac{22}{7} \times 28 = 176 \text{ cm}$$

$$352 \text{ m} = 35200 \text{ cm}$$

$$\text{Number of times of rotation} = 35200 \div 176 = 200.$$

Q17. The minute hand of a circular clock is 15 cm long . How far does the tip of the minute hand move in 1 hour .

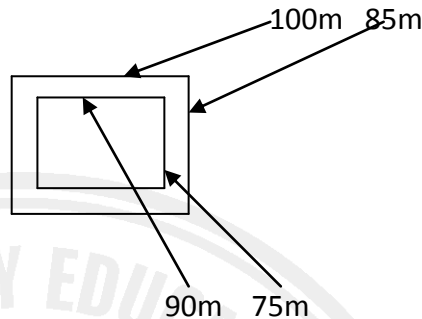
Ans : In one hour it will make a complete circle.

$$\text{Distance moved by the tip} = \text{circumference} = 2 \times 3.14 \times 15 = 94.2 \text{ cm.}$$

Exercise 11.4

Q1. A garden is 90m long and 75m broad . A path 5m wide is to be built outside and around it . Find the area of the path . Also find the area of the garden in hectare.

Ans :



$$\text{Area of the new bigger rectangle} = 100 \times 85 = 8500 \text{ m}^2$$

$$\text{Area of the smaller rectangle} = 90 \times 75 = 6750 \text{ m}^2$$

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

$$\text{Area of the garden in hectare} = 6750 \text{ m}^2 \div 10000 = 0.675 \text{ hectare}$$

Q2. A 3m wide path runs outside and around a rectangular park of length 125m and breadth 65m . Find the area of the path.

Ans : Area of the rectangular park = $125 \times 65 = 8125 \text{ m}^2$

$$\text{Area of the bigger rectangle} = 131 \times 71 = 9301 \text{ m}^2$$

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

Q3. A picture is painted on a cardboard 8cm long and 5cm wide such that there is a margin of 1.5 cm along each of its sides . Find the total area of the margin.

Ans : We will have two rectangles .One Rectangle is the cardboard itself . The other is formed by margin line . Area of the margin is the difference between the areas of the two rectangles . The length and breadth of the rectangle formed by the margin will reduced by 2×1.5 i.e. 3cm from that of cardboard.

$$\text{Area of the cardboard} = 8 \times 5 = 40 \text{ cm}^2$$

$$\text{Area of the rectangle formed by margin line} = 5 \times 2 = 10 \text{ cm}^2$$

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

Q4. A verandah of width 2.25m is constructed all along outside a room which is 5.5m long and 4m wide .Find (i) the area of the path (ii) the cost of cementing the floor of the verandah at the rate of Rs 200 per m² .

Ans . (i)

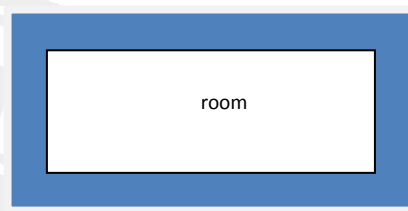
After constructing the verandah we will get a bigger rectangle .

Length of the bigger rectangle = 5.5 +2.25 +2.25 = 10 m

Breadth of the bigger rectangle = 4 +2.25 +2.25 =8.5 m

Area of bigger rectangle = 10 x 8.5 =85 m²

Area of smaller rectangle = 5.5 x 4 = 22m²



Area of the verandah = 85 – 22 = 63 m² .

(ii) cost of cementing = area x rate = 63 x 200 = Rs 12600

Q5. A path 1m 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 m² .

Ans :

After building the path we get a new square smaller in size.

The length will be reduced by 1m on both

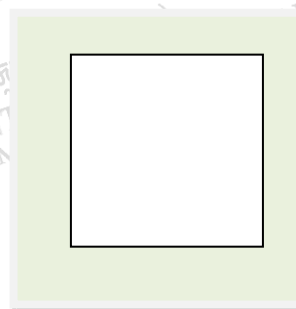
Length of each side.

Area of the bigger square = 30 x30 = 900 m²

Area of the smaller square = 28 x 28 = 784 m²

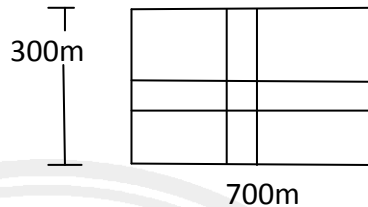
(i) Area of the path = 900 –784 = 116 m²

(ii) Cost of planting grass = Area x Rate = 784 X 40 = Rs 31360.



Q6. Two cross roads each of width 10 cm , cut at right angles through the centres of a rectangular park of length 700 m and breadth 300m and parallel to its sides . Find the area of the roads . Also find the area of the park excluding the cross roads . Give the answer in hectares.

Ans :



Length of the road parallel to the length of the park = 700 m

Width of the road = 10m

So Area of the road = $l \times b = 700\text{m} \times 10\text{m} = 7000\text{m}^2$

Length of the road parallel to the breadth of the park = 300m

Width of the road = 10 m

Area of the road = $l \times b = 300 \times 10 = 3000 \text{ m}^2$

Area of the both roads = $7000 + 3000 - \text{area of common portion}$

$$= 10000 - 10 \times 10$$

$$= 10000 - 100$$

$$= 9900 \text{ m}^2 = 0.99 \text{ hectare.}$$

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

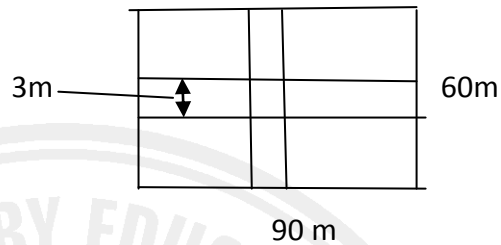
Area of the park excluding the roads = $210000 - 9900 = 200100\text{m}^2 = 20.01 \text{ hectare.}$



Q7. Through a rectangular field of length 90m and breadth 60m , 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 3m find

(i) the area covered by the roads (ii) the cost of constructing the roads at the rate of Rs 110 per m²

Ans :



Length of the road along the length of the field = 90m and breadth = 3m

Therefore Area of this road = $l \times b = 90 \times 3 = 270 \text{ m}^2$

The area of the road parallel to the breadth of the field = $60 \times 3 = 180 \text{ m}^2$

Area of the common portion = $3 \times 3 = 9 \text{ m}^2$

(i) Area of the two roads = $270 + 180 - 9 = 441 \text{ m}^2$

(ii) Cost of constructing the roads = $110 \times 441 = \text{Rs } 48510.$

Q8. Pragya wrapped a card around a circular pipe of radius 4cm and cut off the length required of the cord . Then she wrapped it around a square box of side 4cm . Did she have any cord left ?

Ans : Length of the cord = circumference of the circular pipe = $2 \pi r = 2 \times 3.14 \times 4$

$$= 25.12 \text{ cm}$$

Perimeter of the square box = $4 \times 4 = 16 \text{ cm}$

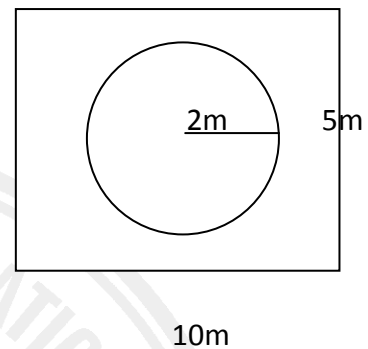
Length of the cord left = $25.12 - 16 = 9.12 \text{ cm}$

Yes , 9.12cm cord is left.



Q9 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 the area of the flower bed (iv) the circumference of the flower bed.



Ans : (i) length of the lawn = 10 m and breadth of the lawn = 5m

$$\text{Area of the lawn} = 10 \times 5 = 50 \text{ m}^2$$

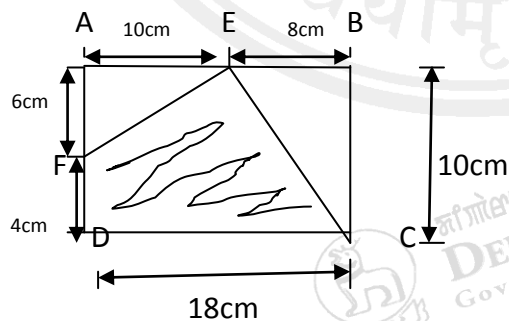
(ii) Area of the circular flower bed = $\frac{22}{7} \times 2 \times 2 = 12.57 \text{ m}^2$

(iii) Area of the lawn excluding the area of flower bed = $50 - 12.57 = 37.43 \text{ m}^2$

(iv) circumference of the flower bed = $2 \times 3.14 \times 2 = 12.56 \text{ m}^2$

Q10 Find the area of the shaded portions :

Ans : (i)



$$\text{Area of the rectangle} = 18 \times 10 = 180 \text{ cm}^2$$

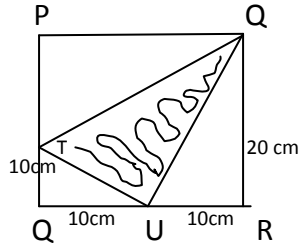
$$\text{Area of the right } \triangle AFE = \frac{1}{2} \times 6 \times 10 = 30 \text{ cm}^2$$

$$\text{Area of the right } \triangle ABC = \frac{1}{2} \times 8 \times 10 = 40 \text{ cm}^2$$

Area of the two right triangles = $30 + 40 = 70 \text{ cm}^2$

Area of the shaded portion = $180 - 70 = 110 \text{ cm}^2$

(ii)



Area of the square PQRS = $20 \times 20 = 400 \text{ cm}^2$

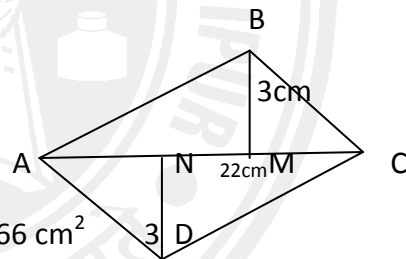
Area of the three right triangles = $\frac{1}{2} \times 10 \times 10 + \frac{1}{2} \times 10 \times 20 + \frac{1}{2} \times 10 \times 20$
 $= 50 + 100 + 100$
 $= 250$

Area of the shaded portion = $400 - 250 = 150 \text{ cm}^2$

Q11. Find the area of ABCD .

Ans : area of ABCD = area of $\triangle ABC$ + area of $\triangle ADC$

$= \frac{1}{2} \times 3 \times 22 + \frac{1}{2} \times 3 \times 22 = 33 + 33 = 66 \text{ cm}^2$



DEPARTMENT OF EDUCATION (S)
 Government of Manipur