

**Class Notes**

**Class: VII**

**Topic: CH-11-PERIMETER AND AREA**

**Subject: MATHEMATICS**

**DATE-30/10/2021**

**EXERCISE 11.2**

6) DL and BM are the heights on sides AB and AD respectively of parallelogram ABCD. If the area of the parallelogram is 1470 cm<sup>2</sup>, AB = 35 cm and AD = 49 cm, find the length of BM and DL.

Solution: Area of the parallelogram = 1470 cm<sup>2</sup>, AB = 35 cm, AD = 49 cm

Area of the parallelogram = base × height

$$\Rightarrow 1470 = AB \times BM$$

$$\Rightarrow 1470 = 35 \times DL$$

$$\Rightarrow DL = \frac{1470}{35}$$

$$\Rightarrow DL = 42 \text{ cm}$$

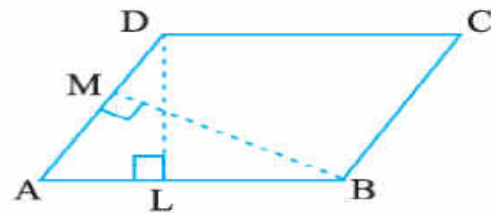
Now, Area of the parallelogram = base × height

$$\Rightarrow 1470 = AD \times BM$$

$$\Rightarrow 1470 = 49 \times BM$$

$$\Rightarrow BM = \frac{1470}{49}$$

$$\Rightarrow BM = 30 \text{ cm}$$



7)  $\Delta ABC$  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  $\Delta ABC$ . Also find the length of AD.

Solution: AB = 5 cm, BC = 13 cm, AC = 12 cm

$$\text{Area of the } \Delta ABC = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times AB \times AC = \frac{1}{2} \times 5 \times 12 = 5 \times 6 = 30 \text{ cm}^2$$

Now, Area of  $\Delta ABC = \frac{1}{2} \times \text{base} \times \text{height}$

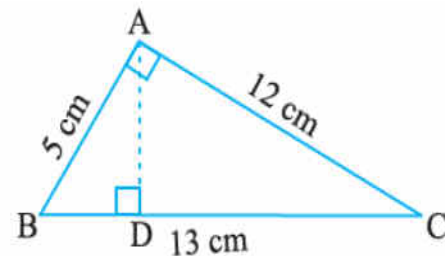
$$\Rightarrow 30 = \frac{1}{2} \times AD \times BC$$

$$\Rightarrow 30 = \frac{1}{2} \times AD \times 13$$

$$\Rightarrow AD = \frac{30 \times 2}{13}$$

$$\Rightarrow AD = \frac{60}{13}$$

$$\Rightarrow AD = 4.6 \text{ cm}$$



8)  $\Delta ABC$  is isosceles with AB = AC = 7.5 cm and BC = 9 cm (Fig 11.26). The height AD from A to BC, is 6 cm. Find the area of  $\Delta ABC$ . What will be the height from C to AB i.e., CE?

Solution: AB = AC = 7.5 cm, BC = 9 cm, AD = 6 cm

$$\text{Area of } \Delta ABC = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times BC \times AD = \frac{1}{2} \times 9 \times 6 = 9 \times 3 = 27 \text{ cm}^2$$

Now, Area of  $\Delta ABC = \frac{1}{2} \times \text{base} \times \text{height}$

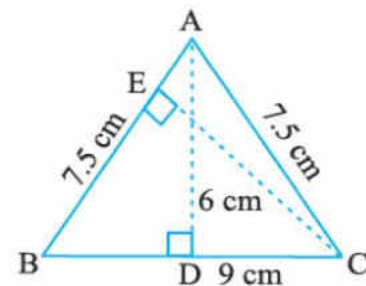
$$\Rightarrow 27 = \frac{1}{2} \times AB \times CE$$

$$\Rightarrow 27 = \frac{1}{2} \times 7.5 \times CE$$

$$\Rightarrow CE = \frac{27 \times 2}{7.5}$$

$$\Rightarrow CE = \frac{54}{7.5}$$

$$\Rightarrow CE = 7.2 \text{ cm}$$



**CIRCLES**

**Circumference of a circle:** the distance around a circular region is known as its circumference. Circumference of a circle =  $\pi d = 2\pi r$ , where d is the diameter and r is the radius of a circle and  $\pi = \frac{22}{7}$  or 3.14 (approximately)

Area of a circle =  $\pi r^2$ , where r is the radius of the circle

**EXERCISE 11.3**

**1. Find the circumference of the circle with the following radius: (Take  $\pi = 22/7$ )****(a) 14 cm**

**Solution:** Circumference of the circle  $= 2\pi r$   
 $= 2 \times \frac{22}{7} \times 14 = 2 \times 22 \times 2 = 88 \text{ cm}$

**(b) 28 cm**

**Solution:** Circumference of the circle  $= 2\pi r$   
 $= 2 \times \frac{22}{7} \times 28 = 2 \times 22 \times 4 = 176 \text{ cm}$

**2. Find the area of the following circles, given that:****a) Radius = 14 mm (Take  $\pi = 22/7$ )**

**Solution:** Area of the circle  $= \pi r^2$   
 $= \frac{22}{7} \times 14^2 = \frac{22}{7} \times 196 = 22 \times 28 = 616 \text{ mm}^2$

**b) Diameter = 49 m**

**Solution:** Diameter of circle (d) = 49 m  
 We know that radius  $= \frac{d}{2} = \frac{49}{2} = 24.5 \text{ m}$   
 Area of the circle  $= \pi r^2$   
 $= \frac{22}{7} \times (24.5)^2 = \frac{22}{7} \times 600.25 = 22 \times 85.75 = 1886.5 \text{ m}^2$

**3. If the circumference of a circular sheet is 154 m, find its radius. Also find the area of the sheet. (Take  $\pi = \frac{22}{7}$ )****Solution:** Circumference of the circular sheet  $= 2\pi r$ 

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

$$\Rightarrow 154 = \frac{44}{7} \times r$$

$$\Rightarrow r = 154 \times \frac{7}{44}$$

$$\Rightarrow r = \frac{49}{2}$$

$$\Rightarrow r = 24.5 \text{ m}$$

Now, Area of the circular sheet  $= \pi r^2 = \frac{22}{7} \times (24.5)^2 = \frac{22}{7} \times 600.25 = 22 \times 85.75 = 1886.5 \text{ m}^2$

So, the radius of circular sheet is 24.5m and its area is 1886.5 m<sup>2</sup>

**4. A gardener wants to fence a circular garden of diameter 21m. 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 costs Rs.4 per meter. (Take  $\pi = \frac{22}{7}$ )****SOLUTION:** Diameter of circular garden = 21m

$$\therefore \text{Circumference of circular garden} = 2\pi r = \pi d = \frac{22}{7} \times 21 = 66\text{m}$$

Length of rope needed to make one round of fence = Circumference of circular garden = 66m

Length of rope needed to make two rounds of fence = 2 x 66m = 132m

Cost of 1m of rope = Rs.4

$$\therefore \text{Cost of 132m of rope} = \text{Rs.}4 \times 132 = \text{Rs.}528$$

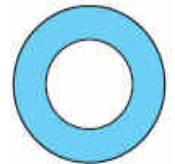
Hence cost of rope is Rs.528

**5. From a circular sheet of radius 4 cm, a circle of radius 3 cm is removed. Find the area of the remaining sheet. (Take  $\pi = 3.14$ )****SOLUTION:** Radius of a circular sheet (outer circle), R = 4cm

Radius of removed circular sheet (inner circle), r = 3cm

Area of remaining sheet = Area of circular sheet of radius 4cm - Area of circular sheet of Radius 3cm.

$$\begin{aligned} &= \pi R^2 - \pi r^2 \\ &= \pi (R^2 - r^2) \\ &= 3.14(4^2 - 3^2) \\ &= 3.14(4 \times 4 - 3 \times 3) \\ &= 3.14(16 - 9) \\ &= 3.14 \times 7 \\ &= 21.98\text{cm}^2 \end{aligned}$$

**6. 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 the lace costs Rs.15. (Take  $\pi = 3.14$ )****SOLUTION:** Diameter = 1.5m  $\Rightarrow$  Radius  $= \frac{1.5}{2} \text{ m}$ 

$$\text{Circumference} = 2\pi r = 2 \times 3.14 \times \frac{1.5}{2} = 4.71\text{m}$$

Cost of 1 m lace = Rs 15

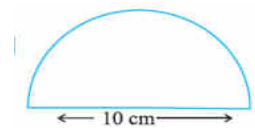
$$\text{Cost of 4.71 m lace} = 4.71 \times 15 = \text{Rs } 70.65$$

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

**SOLUTION:** Radius = 5 cm

Length of curved part =  $\pi r = 3.14 \times 5 = 15.71$  cm

Total perimeter = Length of curved part + Length of diameter  
 =  $15.71 + 10 = 25.71$  cm



**9. Shazli took a wire of length 44 cm 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? (Take  $\pi = \frac{22}{7}$ )**

**SOLUTION:** Circumference = 44 cm  $\Rightarrow 2\pi r = 44$  cm

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

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

$$\Rightarrow r = 7 \text{ cm}$$

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

If the wire is bent into a square, then the length of its each side = Perimeter  $\div 4 = 44 \div 4 = 11$  cm

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

Therefore circle encloses more area.

**10. From a circular card sheet of radius 14 cm, two circles of radius 3.5 cm and a rectangle of length 3 cm and breadth 1 cm are removed (as shown in the adjoining figure). Find the area of the remaining sheet. (Take  $\pi = \frac{22}{7}$ )**

**SOLUTION:** Radius of bigger circle,  $R = 14$  cm

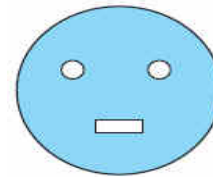
$$\text{Radius of smaller circle, } r = 3.5 \text{ cm} = \frac{3.5 \times 10}{10} = \frac{35}{10} = \frac{7}{2} \text{ cm}$$

$$\text{Area of bigger circle} = \pi R^2 = \frac{22}{7} \times 14 \times 14 = 616 \text{ cm}^2$$

$$\text{Area of 2 small circles} = 2 \times \pi r^2 = 2 \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = 77 \text{ cm}^2$$

$$\text{Area of rectangle} = \text{Length} \times \text{Breadth} = 3 \times 1 = 3 \text{ cm}^2$$

$$\text{Remaining area of sheet} = 616 - 77 - 3 = 536 \text{ cm}^2$$



**12. The circumference of a circle is 31.4 cm. Find the radius and the area of the circle? (Take  $\pi = 3.14$ )**

**SOLUTION:** Circumference = 31.4

$$\Rightarrow 2\pi r = 31.4 \text{ cm}$$

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

$$\Rightarrow r = \frac{31.4}{2 \times 3.14}$$

$$\Rightarrow r = 5 \text{ cm}$$

$$\text{Area} = \pi r^2 = 3.14 \times 5 \times 5 = 78.50 \text{ cm}^2$$

**13. A circular flower bed is surrounded by a path 4 m wide. The diameter of the flower bed is 66 m. What is the area of this path? (Take  $\pi = 3.14$ )**

**SOLUTION:** Diameter of flower bed = 66 m

Radius of flower bed,  $r = \text{Diameter} \div 2 = 66 \div 2 = 33$  m

Radius of flower bed including path,  $R = r + \text{width of path} = 33 + 4 = 37$  m

Area of path = Area of flower bed including path - Area of flower bed

$$= \pi R^2 - \pi r^2$$

$$= \pi (R^2 - r^2)$$

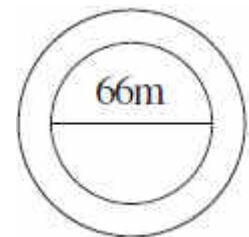
$$= 3.14(37^2 - 33^2)$$

$$= 3.14 (37 \times 37 - 33 \times 33)$$

$$= 3.14 (1369 - 1089)$$

$$= 3.14 \times 280$$

$$= 879.20 \text{ m}^2$$



**ASSIGNMENT: Exercise 11.3 – Remaining subparts of Q1 and Q2, Q.8, 11 of NCERT**