

Board – CBSE

Class – 7th

Topic – Perimeter and Area 11.3

**Q.1** Find the circumference of the circles with the following radius: (Take  $\pi = \frac{22}{7}$ )

(a) 14 cm      (b) 28 mm      (c) 21 cm

**Sol:** (a)  $r = 14$  cm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 14 = 88 \text{ cm}$$

(b)  $r = 28$  mm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 28 = 176 \text{ mm}$$

(c)  $r = 21$  cm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 21 = 132 \text{ cm}$$

**Q.2** Find the area of the following circles, given that:

(a) Radius = 14 mm (Take  $\pi = \frac{22}{7}$ )      (b) Diameter = 49 m      (c) Radius = 5 cm

**Sol:** (a)  $r = 14$  mm

$$\text{Area} = \pi r^2 = 616 \text{ mm}^2$$

(b)  $d = 49$  m

$$r = \frac{49}{2} \text{ m}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} = 1886.5 \text{ m}^2$$

(c)  $r = 5$  cm

$$\text{Area} = \pi r^2 = \frac{22}{7} \times 5 \times 5 = 78.57 \text{ cm}^2$$

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

**Sol:** Circumference =  $2\pi r = 154$  m

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

$$r = 154 \times \frac{7}{44} = \frac{49}{2} = 24.5 \text{ m}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} = 1886.5 \text{ m}^2$$

- Q.4** 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 costs of the rope, if it cost Rs 4 per meter.

(Take  $\pi = \frac{22}{7}$ )

**Sol:**  $d = 21 \text{ m}$

$$r = \frac{21}{2} \text{ m}$$

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times \frac{21}{2} = 66 \text{ m}$$

$$\text{Length of rope required for fencing} = 2 \times 66 \text{ m} = 132 \text{ m}$$

$$\text{Cost of 1 m rope} = \text{Rs } 4$$

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

- Q.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  $\pi = 3.14$ )



**Sol:** Outer radius of circular sheet = 4 cm

Inner radius of circular sheet = 3 cm

$$\text{Remaining area} = 3.14 \times 4 \times 4 - 3.14 \times 3 \times 3 = 50.24 - 28.26 = 21.98 \text{ cm}^2$$

- Q.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  $\pi = 3.14$ )

**Sol:** Circumference =  $2\pi r$

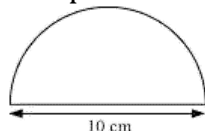
$$\text{Circumference} = 2 \times 3.14 \times \frac{d}{2}$$

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

$$\text{Cost of 1 m lace} = \text{Rs } 15$$

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

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



**Sol:** Radius = 5 cm

$$\text{Length of curved part} = \pi r = \frac{22}{7} \times 5 = 15.71 \text{ cm}$$

$$\text{Total perimeter} = \text{Length of curved part} + \text{Length of diameter} = 15.71 + 10 = 25.71 \text{ cm}$$

**Q.8** Find the cost of polishing a circular table-top of diameter 1.6 m, if the rate of polishing is Rs 15/m<sup>2</sup>. (Take  $\pi = 3.14$ )

**Sol:** Diameter = 1.6 m

$$\text{Radius} = \frac{1.6}{2} = 0.8 \text{ m}$$

$$\text{Area} = 3.14 \times 0.8 \times 0.8 = 2.0096 \text{ m}^2$$

$$\text{Cost for polishing 1 m}^2 \text{ area} = \text{Rs } 15$$

$$\text{Cost for polishing 2.0096 m}^2 \text{ area} = 15 \times 2.0096 = 30.14$$

Therefore, it will cost Rs 30.14 for polishing such circular table.

**Q.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  $\pi = \frac{22}{7}$ )

**Sol:** Circumference =  $2\pi r = 44$  cm

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

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

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

If the wire is bent into a square, then the length of each side would be =

$$\text{Area of square} = (11)^2 = 121 \text{ cm}^2$$

Therefore, circle encloses more area.

**Q.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 following figure). Find the area of the remaining sheet. (Take  $\pi = \frac{22}{7}$ )

**Sol:** Area of bigger circle =  $\frac{22}{7} \times 14 \times 14 = 616 \text{ cm}^2$

$$\text{Area of 2 small circles} = 2 \times \pi r^2 = 2 \times \frac{22}{7} \times 3.5 \times 3.5 = 77 \text{ cm}^2$$

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

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

**Q.11** 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? (Take  $\pi = 3.14$ )

**Sol:** Area of square-shaped sheet =  $(\text{Side})^2 = (6)^2 = 36 \text{ cm}^2$

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

$$\text{Remaining area of sheet} = 36 - 12.56 = 23.44 \text{ cm}^2$$

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

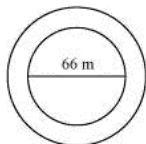
**Sol:** Circumference =  $2\pi r = 31.4 \text{ cm}$

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

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

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

**Q.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? ( $\pi = 3.14$ )



**Sol:** Radius of flower bed =  $\frac{66}{2} = 33 \text{ m}$

$$\text{Radius of flower bed and path together} = 33 + 4 = 37 \text{ m}$$

$$\text{Area of flower bed and path together} = 3.14 \times 37 \times 37 = 4298.66 \text{ m}^2$$

$$\text{Area of flower bed} = 3.14 \times 33 \times 33 = 3419.46 \text{ m}^2$$

$$\text{Area of path} = \text{Area of flower bed and path together} - \text{Area of flower bed}$$

$$\text{Area of path} = 4298.66 - 3419.46 = 879.20 \text{ m}^2$$

**Q.14** A circular flower garden has an area of  $314 \text{ m}^2$ . A sprinkler at the centre of the garden can cover an area that has a radius of  $12 \text{ m}$ . Will the sprinkler water the entire garden? (Take  $\pi = 3.14$ )

**Sol:**  $\text{Area} = \pi r^2 = 314 \text{ m}^2$

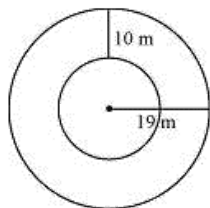
$$3.14 \times r^2 = 314$$

$$r^2 = 100$$

$$r = 10 \text{ m}$$

Yes, the sprinkler will water the whole garden.

**Q.15** Find the circumference of the inner and the outer circles, shown in the adjoining figure? (Take  $\pi = 3.14$ )



**Sol:** Radius of outer circle =  $19 \text{ m}$

$$\text{Circumference} = 2\pi r = 2 \times 3.14 \times 19 = 119.32 \text{ m}$$

$$\text{Radius of inner circle} = 19 - 10 = 9 \text{ m}$$

$$\text{Circumference} = 2\pi r = 2 \times 3.14 \times 9 = 56.52 \text{ m}$$

**Q.16** How many times a wheel of radius  $28 \text{ cm}$  must rotate to go  $352 \text{ m}$ ? (Take  $\pi = \frac{22}{7}$ )

**Sol:**  $r = 28 \text{ cm}$

$$\text{Circumference} = 2\pi r = 176 \text{ cm}$$

$$\text{Number of rotations} = \frac{\text{Total distance to be covered}}{\text{Circumference of wheel}} = \frac{352 \text{ m}}{176 \text{ cm}} = \frac{35200}{176} = 200$$

Therefore, it will rotate 200 times.

**Q.17** The minute hand of a circular clock is 15 cm long. How far does the tip of the minute hand move in 1 hour? (Take  $\pi = 3.14$ )

**Sol:** Distance travelled by the tip of minute hand = Circumference of the clock  
 $= 2\pi r = 2 \times 3.14 \times 15 = 94.2$  cm