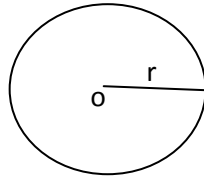
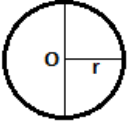
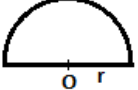
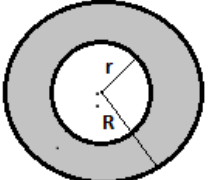




**AREAS RELATED TWO CIRCLES****IMPORTANT CONCEPTS:-****TAKE A LOOK**

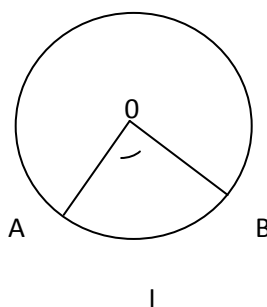
1. Circle: The set of points which are at a constant distance of  $r$  units from a fixed point  $o$  is called a circle with centre  $o$ .



2. Circumference: The perimeter of a circle is called its circumference.
3. Secant: A line which intersects a circle at two points is called secant of the circle.
4. Arc: A continuous piece of circle is called an arc of the circle..
5. Central angle:- An angle subtended by an arc at the center of a circle is called its central angle.
6. Semi Circle: - A diameter divides a circle into two equal arcs. Each of these two arcs is called a semi circle.
7. Segment :- A segment of a circle is the region bounded by an arc and a chord, including the arc and the chord.
8. Sector of a circle: The region enclosed by an arc of a circle and its two bounding radii is called a sector of the circle.
9. Quadrant:- One fourth of a circular region is called a quadrant. The central angle of a quadrant is  $90^\circ$ .

S.N	NAME	FIGURE	PERIMETER	AREA
1.	Circle		$2\pi r$ or $\pi d$	$\pi r^2$
2.	Semi- circle		$\pi r + 2r$	$\frac{1}{2} \pi r^2$
3.	Ring (Shaded region)		Outer = $2\pi R$ Inner = $2\pi r$	$\pi (R^2 - r^2)$
4.	Sector of a circle		$\frac{\pi r \theta}{180^\circ} + 2r$	$\frac{\pi r^2 \theta}{360^\circ}$ or $\frac{1}{2} lr$
5.	Segment of a circle		$\frac{\pi r \theta}{180^\circ} + 2r \sin \frac{\theta}{2}$	$\frac{\pi r^2 \theta}{360^\circ} - \frac{1}{2} r^2 \sin \theta$

a. Length of an arc AB =  $\frac{\theta}{360^\circ} \times 2\pi r$



b. Area of major segment = Area of a circle – Area of minor segment

c. Distance moved by a wheel in  
1 rotation = circumference of the wheel

d. Number of rotation in 1 minute

= Distance moved in 1 minute / circumference

## LEVEL-I

1. If the perimeter of a circle is equal to that of square, then the ratio of their areas is
  - i.  $22/7$
  - ii.  $14/11$
  - iii.  $7/22$
  - iv.  $11/14$

[Ans-ii]
2. The area of the square that can be inscribed in a circle of 8 cm is
  - i.  $256 \text{ cm}^2$
  - ii.  $128 \text{ cm}^2$
  - iii.  $64\sqrt{2} \text{ cm}^2$
  - iv.  $64 \text{ cm}^2$

[Ans-ii]
3. Area of a sector to circle of radius 36 cm is  $54\pi \text{ cm}^2$ . Then the length of the corresponding arc of the circle is
  - i.  $6\pi \text{ cm}$
  - ii.  $3\pi \text{ cm}$
  - iii.  $5\pi \text{ cm}$
  - iv.  $8\pi \text{ cm}$

[Ans –ii]
4. A wheel has diameter 84 cm. The number of complete revolution it will take to cover 792 m is.
  - i. 100
  - ii. 150
  - iii. 200
  - iv. 300

[Ans-iv]
5. The length of an arc of a circle with radius 12cm is  $10\pi$  cm. The central angle of this arc is .
  - i.  $120^\circ$
  - ii.  $60^\circ$
  - iii.  $75^\circ$
  - iv.  $150^\circ$

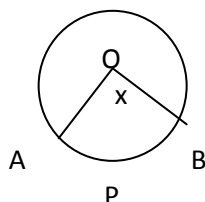
[Ans-iv]
6. The area of a quadrant of a circle whose circumference is 22 cm is
  - i.  $7/2 \text{ cm}^2$
  - ii.  $7 \text{ cm}^2$
  - iii.  $3 \text{ cm}^2$
  - iv.  $9.625 \text{ cm}^2$

[Ans-iv]

## LEVEL-II

1. In fig o is the centre of a circle. The area of sector OAPB is  $5/18$  of the area of the circle find x.

[Ans 100]



2. If the diameter of a semicircular protractor is 14 cm, then find its perimeter .

[Ans-36 cm]

3. The radius of two circle are 3 cm and 4 cm . Find the radius of a circle whose area is equal to the sum of the areas of the two circles.

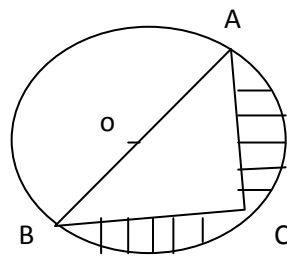
[Ans-5 cm]

4. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.

[Ans-154/3 cm]

### LEVEL-III

1. Find the area of the shaded region in the figure if  $AC=24$  cm , $BC=10$  cm and  $o$  is the center of the circle (use  $\pi = 3.14$ )



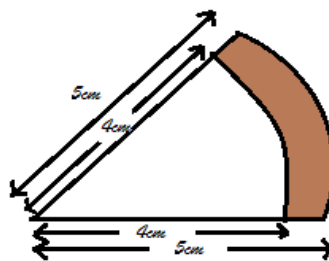
[Ans- 145.33 cm<sup>2</sup>]

2. The inner circumference of a circular track is 440m. The track is 14m wide. Find the diameter of the outer circle of the track. [Take  $\pi = 22/7$ ]

[Ans-168]

3. Find the area of the shaded region.

[Ans-9.625 m<sup>2</sup>]



4. A copper wire when bent in the form of a square encloses an area of 121 cm<sup>2</sup> . If the same wire is bent into the form of a circle, find the area of the circle (Use  $\pi = 22/7$ )

[Ans 154 cm<sup>2</sup>]

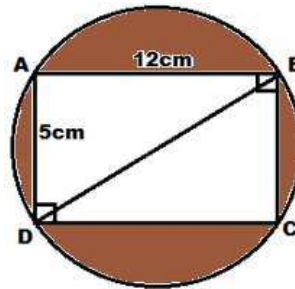
5. A wire is looped in the form of a circle of radius 28cm. It is rebent into a square form. Determine the side of the square (use  $\pi = 22/7$ )

[Ans-44cm]

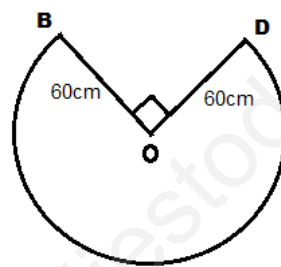
## LEVEL-IV

1. In fig, find the area of the shaded region [use  $\pi = 3.14$  cm<sup>2</sup>]

[Ans: 72.67



2. In fig. the shape of the top of a table in a restaurant is that of a sector of a circle with centre O and  $\angle BOD = 90^\circ$ . If  $OB = OD = 60$ cm find
- The area of the top of the table [Ans 8478 cm<sup>2</sup>]
  - The perimeter of the table top (Take  $\pi = 3.44$ ) [Ans 402.60 cm]



3. An arc subtends an angle of  $90^\circ$  at the centre of the circle of radius 14 cm. Find the area of the minor sector thus formed in terms of  $\pi$ . [Ans  $49\pi$  cm<sup>2</sup>]
4. The length of a minor arc is  $\frac{2}{9}$  of the circumference of the circle. Write the measure of the angle subtended by the arc at the center of the circle. [Ans  $80^\circ$ ]
5. The area of an equilateral triangle is  $49\sqrt{3}$  cm<sup>2</sup>. Taking each angular point as center, circles are drawn with radii equal to half the length of the side of the triangle. Find the area of triangle not included in the circles. [Take  $\pi \sqrt{3} = 1.73$ ] [Ans 777cm<sup>2</sup>]

## SELF EVALUATION

- Two circles touch externally. The sum of their areas is  $130\pi$  cm<sup>2</sup> and distance between their centers is 14 cm. Find the radii of circles.
- Two circles touch internally. The sum of their areas is  $116\pi$  cm<sup>2</sup> and the distance between their centers is 6 cm. Find the radii of circles.
- A pendulum swings through an angle of  $30^\circ$  and describes an arc 8.8 cm in length. Find length of pendulum.
- What is the measure of the central angle of a circle?
- The perimeter and area of a square are numerically equal. Find the area of the square.