CONSTRUCTION

KEY POINTS

1. Division of line segment in the given ratio.

2. Construction of triangles:-

   a. When three sides are given.
   b. When two sides and included angle given.
   c. When two angles and one side given.
   d. Construction of right angled triangle.

3. Construction of triangle similar to given similar to given triangle as per given scale.

4. Construction of triangles to a circle.

LEVEL - I

1. Divide a line segment in given ratio.

2. Draw a line segment AB=8cm and divide it in the ratio 4:3.

3. Divide a line segment of 7cm internally in the ratio 2:3.

4. Draw a circle of radius 4 cm. Take a point P on it. Draw tangent to the given circle at P.

5. Construct an isosceles triangle whose base 7.5 cm and altitude is 4.2 cm.

LEVEL –II

1. Construct a triangle of sides 4cm , 5cm and 6cm and then triangle similar to it whose side are 2/3 of corresponding sides of the first triangle.

2. Construct a triangle similar to a given ΔABC such that each of its sides is $2/3^{rd}$ of the corresponding sides of ΔABC. It is given that AB=4cm BC=5cm and AC=6cm also write the steps of construction.

3. Draw a right triangle ABC in which $\angle B=90^0$ AB=5cm, BC=4cm then construct another triangle ABC whose sides are 5/3 times the corresponding sides of ΔABC.

4. Draw a pair of tangents to a circle of radius 5cm which are inclined to each other at an angle of 60^0.

5. Draw a circle of radius 5cm from a point 8cm away from its centre construct the pair of tangents to the circle and measure their length.

6. Construct a triangle PQR in which QR=6cm $\angle Q=60^0$ and $\angle R=45^0$. Construct another triangle similar to ΔPQR such that its sides are 5/6 of the corresponding sides of ΔPQR.
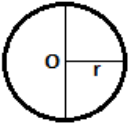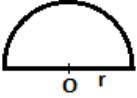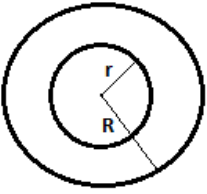
AREAS RELATED TWO CIRCLES

KEY POINTS

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.
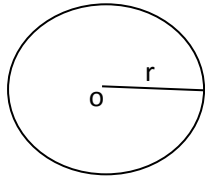
2. Circumference: The perimeter of a circle is called its circumference.

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 and 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 arc. 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 f of a circle: The region enclosed by and an arc of a circle and its two bounding radii is called a sector of the circle.

9. Quadrant:- One fourth of a circle disc is called a quadrant. The central ang of a quadrant is 90^0.

S.N	NAME	FIGURE	PERIMETER	AREA
1.	Circle		$2\pi r$ or πd	πr^2
2.	Semi- circle		$\pi r + 2r$	½ πr^2
3.	Ring (Shaded region)		$2\pi(r + R)$	$\pi(R^2 - r^2)$
4.	Sector of a circle		l+2r=$\frac{\pi r\theta}{180°} + 2r$	$\frac{\pi r^2\theta}{360°}$ or $\frac{1}{2}lr$
5.	Segment of a circle		$\frac{\pi r\theta}{180°}$+2r Sin$\frac{\theta}{2}$	$\frac{\pi r^2\theta}{360°} - \frac{1}{2}r^2\sin\theta$

a. Length of an arc AB= $\frac{\theta}{360}$ $2\pi r$
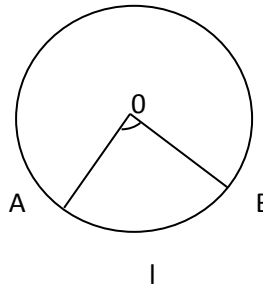
b. Area of major segment= Area of a circle – Area of minor segment

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 cm^2
    ii.   128 cm^2
    iii.   64√2 cm^2
    iv.   64 cm^2 [Ans-ii]

3. Area of a sector to circle of radius 36 cm is 54 πcm^2 . Find the length arc of the corresponding arc of the circle is
    i.   6 πcm
    ii.   3 πcm
    iii.   5 πcm
    iv.   8 πcm

                                                                         [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 π cm. The central angle of this arc is .
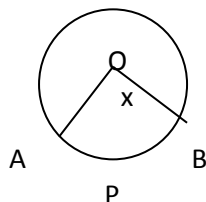   i.   120^0 [Ans-iv]
    ii.   60^0
    iii.   75^0
    iv.   150^0

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

LEVEL-II

1. In figure '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]

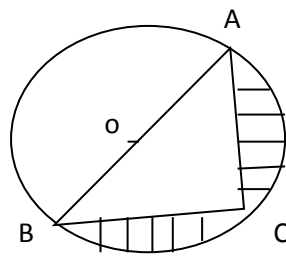4. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.
[Ans: 154/3 cm]

5. The radii 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 5cm]

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 $\pi = 3.14$)
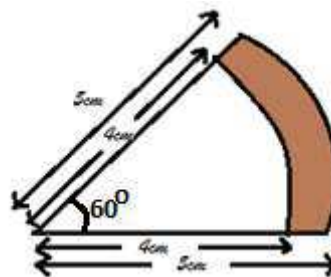
[Ans- 145.33 cm^2]

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 π =22/7]

[Ans-168]

3. Find the area of the shaded region.

[Ans: 4.71 cm^2]

4. A copper wire when bent in the form of a square encloses an area of 121 cm^2 . If the same wire is bent into the form of a circle, find the area of the circle (Use π=22/7)
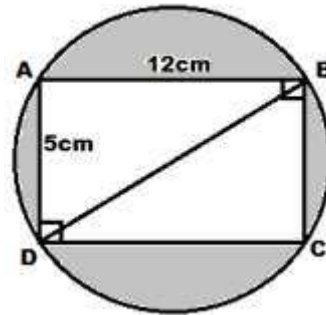
[Ans 154 cm^2]

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 $\pi = 22/7$)
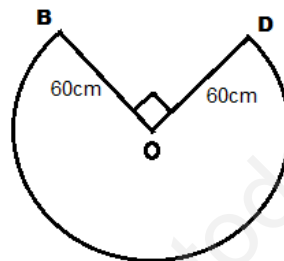
[Ans-44cm]

LEVEL-IV

1. In fig, find the area of the shaded region [use $\pi = 3.44$]

2. In fig find the shape of the top of a table in restaurant is that of a sector a circle with centre 0 and $\angle bod = 90^0$. If OB=OD=60cm fnd
   i.   The area of the top of the table [Ans 8478 cm²]
   ii.   The perimeter of the table top (Take $\pi = 3.44$) [Ans 402.60 cm]

3. An arc subtends an angle of 90^0 at the centre of the circle of radius 14 cm. Write the area of minor sector thus form in terms of π.

   [Ans 49π cm²]

4. The length of a minor arc is 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 80^0]

5. The area of an equilateral triangle is 49√3 cm². Taking each angular point as center, circle are drawn with radius equal to half the length of the side of the triangle. Find the area of triangle not included in the circles. [Take π √3=1.73]   [Ans 777cm²]

SELF EVALUATION

1. Two circles touch externally the sum of the areas is 130 π cm² and distance between there center is 14 cm. Find the radius of circle.

2. Two circle touch internally. The sum of their areas is 116 π cm² and the distance between there centers is 6 cm. Find the radius of circles.

3. A pendulum swings through an angle of 30^0 and describes and arc 8.8 cm in length. Find length of pendulum.

4. What is the measure of the central angle of a circle?

5. The perimeter and area of a square are numerically equal. Find the area of the square.