INDIAN SCHOOL NIZWA - WORKSHEET

MATHEMATICS

11.Areas related to Circles

Name: _____ Date:_____ Class: X Sec: ___

1. The length of an arc of a circle with radius 12cm is 10πcm. The central angle subtended by this arc at the centre, is :
   a) 120^0 b) 60^0 c) 75^0 d) 150^0

2. What is the length of the arc of the sector of a circle with radius 14cm and of central angle 90^0?
   a)22cm b) 44cm c) 88cm d) 11cm

3. The hour-hand of a clock is 6cm long. The angle swept by it between 7:20a.m and 7:55 a.m is :
   a) $\left(\frac{35}{4}\right)^0$ b)) $\left(\frac{35}{2}\right)^0$ c) 35^0 d) 70^0

4. The diameter of a wheel is 63cm. The distance travelled by the wheel in 100 revolutions is :
   a) 99m b) 198m c) 63m d) 136cm

5. OAB is sector of a circle with center O and radius 7cm. If length of arc $\widehat{AB} = \frac{22}{3}cm$, then $\angle$ AOB is equal to
   a) $\left(\frac{120}{7}\right)^0$ b) 45° c) 60° d) 30°

6. An arc of length 22cm subtends an angle of x^0 at the centre of the circle. If radius of circle is 36cm, the value of x is
   a) 35 b) 40 c) 60 d) 30

7. A chord of a circle of radius 10 cm subtends a right angle at the centre of the circle. Find the area of the corresponding minor segment. Use [$\pi = 3.14$]

8. If the radius of a circle is 4.2 cm, compute its area and circumference.

9. What is the area of a circle whose circumference is 44 cm?

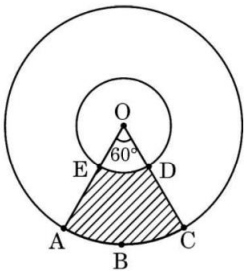
10. Calculate the area of a sector of angle 60°. Given, the circle has a radius of 6 cm.

11. A chord subtends an angle of 90°at the centre of a circle whose radius is 20 cm. Compute the area of the corresponding major segment of the circle.

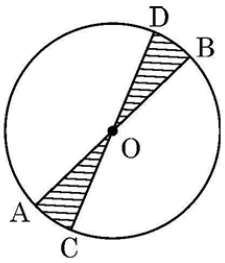
12. Find the area of the sector of a circle with a radius of 4cm and an angle of 30°. Also, find the area of the corresponding major sector.

13. The wheels of a car are of diameter 80 cm each. How many complete revolutions does each wheel make in 10 minutes when the car is travelling at a speed of 66 km per hour?

14. Find the area of the sector of a circle with a radius of 4 cm and an angle of 30°. Also, find the area of the corresponding major sector (Use $\pi = 3.14$).
15. Find the area of the segment formed by the chord AB in a circle with centre O, if the circle radius is 21 cm and $\angle AOB = 120°$. (Use $\pi = 22/7$).
16. A car has two wipers which do not overlap. Each wiper has a blade of length 21cm sweeping through an angle of 120^0. Find the total area cleaned at each sweep of the two blades.
17. In the given, figure, two concentric circles with centre O are shown. The Radii of the circles are 2cm and 5 cm respectively. Find the area of the shaded region.

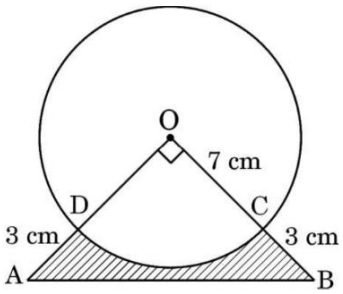


18. AB and CD are diameters of a circle with centre O and radius 7cm. If $\angle BOD = 30^0$, then find the area and perimeter of the shaded region.



19. **CASE STUDY-1**

In an annual day function of a school, the organizers wanted to give a cash prize along with a memento to their best students. Each memento is made as shown in the figure and its base ABCD is shown from the front side. The rate of silver plating is 20 per cm^2.



Based on the above, answer the following questions:

i) What is the area of the quadrant ODCO?

ii) Find the area of ΔAOB.

iii) a) What is the total cost of silver plating the shaded part ABCD?

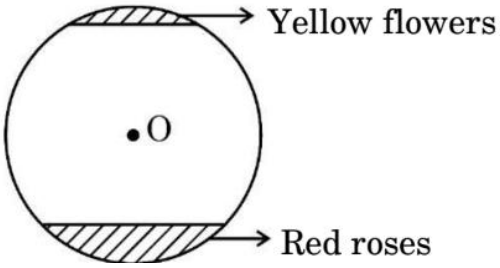
OR

b) What is the length of the arc CD?

20. **CASE STUDY 2:**

Flower beds look beautiful growing in gardens. One such circular park of radius "r" m, has two segments with flowers. One segment which subtends an angle of 90^0 at the centre is full of red roses,

while the other segment with central angle 60^0 is full of yellow coloured flowers.



It is given that the combined area of the two segments (of flowers) is $256\frac{2}{3}$ sq.m.

Based on the above, answer the following questions:

i) Write an equation representing the total area of the two segments in terms of "r".

ii) Find the value of "r"

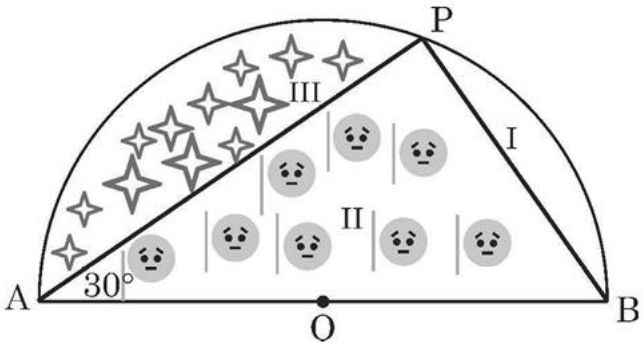
iii) a) Find the area of the segment with red roses.

OR

b) Find the area of the segment with yellow flowers.

21. **CASE STUDY 3:**

Anurag purchased a farm house which is in the form of a semicircle of diameter 70m. He divides it into three parts by taking a point P on the semicircle in such a way that $\angle PAB = 30^0$ as shown in the following figure, where O is the centre of semicircle.



In part I, he planted saplings of Mango tree, in part II, he grew tomatoes and in part III, he grew oranges. Based on given information, answer the following questions.

i) What is the measure of $\angle POA$?

ii) Find the length of wire needed to fence entire piece of land,

iii) A)Find the area of region in which sapings of Mango tree are planted.

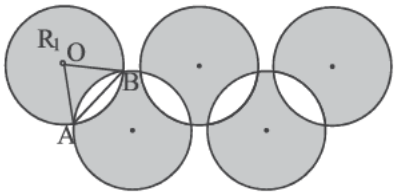
OR

B)Find the length of wire needed to fence the region III.

22. **CASE STUDY 4:**

The Olympic symbol comprising five interlocking rings represents the union of the five continents of the world and the meeting of athletes from all over the world at the Olympic games. In order to spread awareness about Olympic game,s students of Class –X took part in various activities organised by the school . One such group of students made 5 circular rings in the school lawn with the help of ropes. Each circular ring required 44m of rope.

Also, in the shaded regions as shown in the figure, students made rangoli showcasing various sports and games. It is given that ΔOAB is an equilateral triangle and all unshaded regions are congruent.



Based on the above information, answer the following questions:

i) Find the radius of each circular ring.

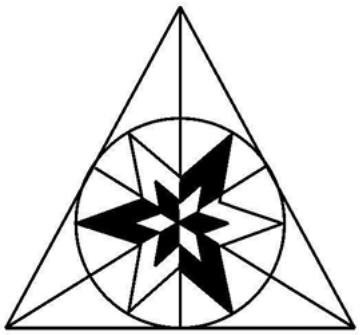
ii) What is the measure of $\angle AOB$?

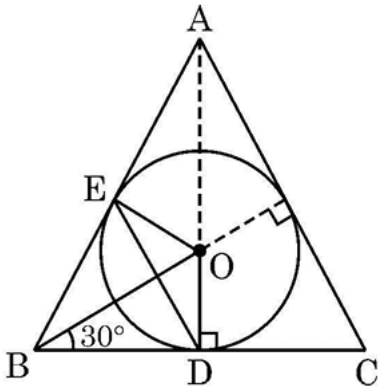
iii) A)Find the area of shaded region R_1.

OR

B)Find the length of rope around the unshaded regions.

23. **CASE STUDY 5:**





In a Fine Arts class, students were asked to design triangular tiles in geometric pattern.
Neelima made a circular design inside an equilateral triangle ABC. The radius of the cirlce is 4cm.
Observe the diagram and answer the following questions:

i) Determine the length OB.

ii) Is DE ‖ CA? Give reason for your answer

iii) a) Write all angles of quadrilateral OEBD and show that it is a cyclic quadrilateral

OR

b)Find the perimeter of ΔABC. $\left(Use\ \sqrt{3} = 1.73\right)$