Chapter 11: **Area Related to Circles**

Top 20 Practice Questions

A. Basic Formula-Based Questions

1.Find the **area of a sector** of a circle with radius **6 cm** if the angle of the sector is $60°$.

2.Find the **area of a quadrant** of a circle whose **circumference is 22 cm**.

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

4.Find the **area of a sector** of a circle of radius **21 cm** and central angle $120°$.

5.Find the **length of an arc** of a sector of a circle with radius **7 cm** and angle $90°$

B. Intermediate Level (Segments & Combinations)

6.A chord of a circle of radius **10 cm** subtends a right angle at the centre. Find the **area of the corresponding minor segment**.

(Use $\pi = 3.14$)

7.In a circle of radius **21 cm**, an arc subtends an angle of $60°$at the centre. Find the **area of the segment** formed by the corresponding chord.

8.A horse is tied to a corner of a square-shaped grass field of side **15 m** by means of a **5 m** long rope. Find the **increase in grazing area** if the rope were **10 m** long instead of 5 m.

9.A brooch is made with silver wire in the form of a circle with diameter **35 mm**. The wire is also used in making **5 diameters** which divide the circle into **10 equal sectors**. Find the **total length of silver wire required**.

10.Find the **area of the shaded region** in a square of side **14 cm**, where four semicircles are drawn with each side of the square as diameter.

C. Advanced & Logical Questions

11.An umbrella has **8 ribs**, which are equally spaced. Assuming the umbrella to be a flat circle of radius **45 cm**, find the **area between two consecutive ribs**.

12.A round table cover has **six equal designs**. If the radius of the cover is **28 cm**, find the **cost of making the designs** at the rate of ₹0.35 per cm^2.

)Use $\sqrt{3} = 1.7($

13.Find the **area of the segment** AYB shown in the figure, if the radius of the circle is **21 cm** and

$$\angle AOB = 120^\circ$$

14.The area of an equilateral triangle ABC is **17320.5 cm²**. With each vertex as centre, a circle is drawn with radius equal to **half the length of the side** of the triangle. Find the **area of the shaded region**.

15.Find the **area of the shaded region** where a circular arc of radius **6 cm** is drawn with vertex O of an equilateral triangle OAB of side **12 cm** as centre.

16.In a circular table cover of radius **32 cm**, a design is formed leaving an equilateral triangle ABC in the middle. Find the **area of the design**.

17.From each corner of a square of side **4 cm**, a quadrant of a circle of radius **1 cm** is cut and also a circle of diameter **2 cm** is cut. Find the **area of the remaining portion**.

18.A car has **two wipers** which do not overlap. Each wiper has a blade of length **25 cm** sweeping through an angle of 115° .Find the **total area cleaned** at each sweep of the blades.

19.Find the **area of a sector** of a circle of radius **5 cm** if the corresponding **arc length is 3.5 cm**.

20.The **perimeter of a sector** of a circle of radius **5.2 cm** is **16.4 cm**. Find the **area of the sector**.

✅ **Exam-Scoring Tips**

•Sector area: $\frac{\theta}{360^\circ} \times \pi r^2$

•Arc length: $\frac{\theta}{360^\circ} \times 2\pi r$

•Segment area = **Sector area − Triangle area**

Top 20 Previous Year Questions (2020–2024)

PYQs (4–5 Marks / Case Study / Numericals)

1.(2023)

Find the **area of the region bounded by two concentric circles** of radii **7 cm** and **14 cm**, having a central angle of 40°.

2. (2020

The perimeters of a **circular shield** and a **square shield** are equal. If the area of the square shield is **121 cm²**, find the **area of the circular shield**.

3.(2022)

A chord of a circle of radius **15 cm** subtends an angle of 60°at the centre. Find the **areas of the corresponding minor and major segments**.

4.(2024)

Find the **area of a sector** of a circle of radius **28 cm** and central angle 45°.

5.(2021)
If the **area of a circle** is numerically equal to **twice its circumference**, find the **diameter of the circle**.
6.(2023 – Case Study)
A person depicts a design on a circular cover. Using the given data, calculate the **area of the required segment** and hence find the **cost of making the design**.
7.(2020)
Find the **area of the shaded region** where $ABCD$ is a square of side **14 cm** and four circles are drawn such that each circle touches externally **two of the remaining three circles**.
8.(2022)
The minute hand of a clock is **12 cm** long. Find the **area of the face of the clock described by the minute hand in 35 minutes**.

9.(2024)
If the difference between the **circumference and the radius** of a circle is **37 cm**, find the **area of the circle**.
10.(2021)
Find the **area of a quadrant** of a circle whose **circumference is 44 cm**.
11.(2023)
The length of the **arc of a sector** of a circle with radius **14 cm** is **22 cm**. Find the **area of the sector**.

12.(2020)

Find the **area of the minor segment** of a circle of radius **14 cm**, when the angle of the corresponding sector is $60°$.

13.(2022)

In a circle of radius **21 cm**, an arc subtends an angle of $60°$at the centre. Find the **length of the arc**.

14.(2024)

Find the **area of the shaded region** in a circle of radius **7 cm**, where the central angle of the sector is $90°$.

15.(2021)

If the **perimeter of a semi-circular protractor** is **36 cm**, find its **diameter**.

16.(2023)

The area of a sector of a circle of radius **5 cm** is $5\pi\ cm^2$ .Find the **angle subtended by the sector at the centre**.

17.(2020)

A square $ABCD$is inscribed in a circle of radius r. Find the **area of the square**.

18.(2022)

Find the **area of the shaded region** if

$$PQ = 24\ cm, PR = 7\ cm$$

and $O$is the centre of the circle.

(Triangle in a semicircle)

19.(2024 – Case Study)

Designs are made on a **square handkerchief** using circular patterns. Find the **area of the remaining part** of the handkerchief.

20.(2021)

The ratio of the **areas of two circles** is $4:9$. Find the **ratio of their circumferences**.

Quick Formula Sheet (Must Remember)

Area of Sector

$$\frac{\theta}{360^\circ} \times \pi r^2$$

Length of Arc

$$\frac{\theta}{360^\circ} \times 2\pi r$$

Area of Segment

$$\text{Area } \textit{of Sector} - \textit{Area of Triangle}$$

$$= \frac{\theta}{360^\circ}\pi r^2 - \frac{1}{2}r^2 \sin\theta$$