

AREAS RELATED TO CIRCLES

OBJECTIVE SECTION

[BASIC/STANDARD]

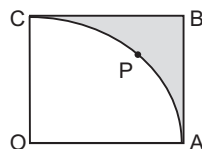
I. MULTIPLE CHOICE QUESTIONS

- If the area of a circle is 154 cm^2 , then its perimeter is:
(a) 11 cm (b) 22 cm (c) 44 cm (d) 55 cm
- If θ is the angle (in degrees) of a sector of a circle of radius r , then area of the sector is:
(a) $\frac{\pi r^2 \theta}{360}$ (b) $\frac{\pi r^2 \theta}{180}$ (c) $\frac{2\pi r \theta}{360}$ (d) $\frac{2\pi r \theta}{180}$
- If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R , then
(a) $R_1 + R_2 = R$ (b) $R_1^2 + R_2^2 = R^2$
(c) $R_1 + R_2 < R$ (d) $R_1^2 + R_2^2 < R^2$
- If the sum of the circumferences of two circles with radii R_1 and R_2 is equal to the circumference of a circle of radius R , then
(a) $R_1 + R_2 = R$
(b) $R_1 + R_2 > R$
(c) $R_1 + R_2 < R$
(d) Nothing definite can be said about the relation among R_1 , R_2 and R .
- If the circumference of a circle and the perimeter of a square are equal, then
(a) Area of the circle = Area of the square
(b) Area of the circle > Area of the square
(c) Area of the circle < Area of the square
(d) Nothing definite can be said about the relation between the areas of the circle and square.
- Area of the largest triangle that can be inscribed in a semi-circle of radius r units is:
(a) r^2 sq. units (b) $\frac{1}{2} r^2$ sq. units (c) $2r^2$ sq. units (d) $\sqrt{2} r^2$ sq. units
- If the perimeter of a circle is equal to that of a square, then the ratio of their areas is
(a) 22 : 7 (b) 14 : 11 (c) 7 : 22 (d) 55 cm
- It is proposed to build a single circular park equal in area to the sum of the areas of two circular parks of diameters 16 m and 12 m in a locality. The radius of the new park would be:
(a) 10 m (b) 15 m (c) 20 m (d) 24 m
- The area of the circle that can be inscribed in a square of side 6 cm is:

- (a) $36 \pi \text{ cm}^2$ (b) $18 \pi \text{ cm}^2$ (c) $12 \pi \text{ cm}^2$ (d) $9 \pi \text{ cm}^2$
10. The area of the square that can be inscribed in a circle of radius 8 cm is:
 (a) 256 cm^2 (b) 128 cm^2 (c) $64\sqrt{2} \text{ cm}^2$ (d) 64 cm^2
11. The radius of a circle whose circumference is equal to the sum of the circumferences of the two circles of diameter 36 cm and 20 cm is:
 (a) 56 cm (b) 42 cm (c) 28 cm (d) 16 cm
12. The diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm is :
 (a) 31 cm (b) 25 cm (c) 62 cm (d) 50 cm
13. If the perimeter of a semi-circular protractor is 36 cm, then its diameter is:
 (a) 8 cm (b) 12 cm (c) 14 cm (d) 18 cm
14. If the radius of a circle is 3.5 cm, then the perimeter of the semicircle is:
 (a) 10 cm (b) 15 cm (c) 18 cm (d) 20 cm
15. The perimeter of a quadrant of a circle of radius $\frac{7}{2}$ is:
 (a) 6.5 cm (b) 12.5 cm (c) 8.5 cm (d) 4.5 cm
16. The diameters of two circles are 38 cm and 18 cm. Then, the diameter of the circle having circumference equal to the sum of circumferences of the two circles, is:
 (a) 56 cm (b) 50 cm (c) 48 cm (d) 52 cm
17. If the circumference of a circle exceeds its diameter by 16.8 cm, then the radius of the circle is:
 (a) 4.92 cm (b) 6 cm (c) 5.5 cm (d) 3.82 cm
18. If the difference between the circumference and radius of a circle is 37 cm, then circumference (in cm) of the circles is:
 (a) 155 (b) 44 (c) 10 (d) 14
19. The distance (in meters) covered by a wheel of diameter 35 cm, in one revolution is:
 (a) 2.2 (b) 1.1 (c) 9 (d) 8.2
20. If the circumference of a circle is 44 cm, then, the area of the circle is:
 (a) 270 cm^2 (b) 48 cm^2 (c) 170 cm^2 (d) 154 cm^2
21. If the perimeter and area of a circle are numerically equal, then the radius of the circle is:
 (a) 2 units (b) π units (c) 6 units (d) 8 units
22. Area of a sector of a circle with radius R and central angle p is:
 (a) $\frac{P}{180^\circ} \times 2\pi R$ (b) $\frac{P}{180^\circ} \times 2\pi R^2$ (c) $\frac{P}{360^\circ} \times 2\pi R$ (d) $\frac{P}{720^\circ} \times 2\pi R^2$
23. If a rectangle of sides 6 cm and 8 cm is inscribed in a circle, then area of a circle excluding the rectangle is:
 (a) 4 cm^2 (b) 30.57 cm^2 (c) 30 cm^2 (d) 48 cm^2
24. A bicycle wheel makes 5000 revolutions in moving 11 km, then diameter of the wheel is:
 (a) 40 cm (b) 108 cm (c) 70 cm (d) 9 cm

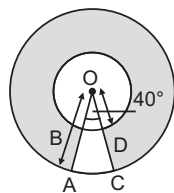
25. A copper wire, when bent in the form of a square, encloses an area 484 cm^2 . If the same wire is bent in the form of a circle, then the area enclosed is:
 (a) 616 cm^2 (b) 600 cm^2 (c) 650 cm^2 (d) 160 cm^2
26. If the perimeter and the area of a circle are numerically equal, then the radius of the circle =
 (a) 3 units (b) 2 units (c) 1.5 units (d) 1 unit
27. The area of a quadrant of a circle, where the circumference of circle is 44 cm is :
 (a) 32.5 cm^2 (b) 35.5 cm^2 (c) 36.5 cm^2 (d) 38.5 cm^2
28. The perimeter (in cm) of a square circumscribing a circle of a radius a cm is :
 (a) $6a$ cm (b) $7a$ cm (c) $8a$ cm (d) $10a$ cm
29. If the area of a circle is equal to sum of the areas of two circles of diameters 10 cm and 24 cm, then the diameter of the large circle (in cm)
 (a) 24 cm (b) 26 cm (c) 28 cm (d) 30 cm

30. In the figure, OABC is a square of side 7 cm. If OAPC is a quadrant of a circle with centre O, then the area of the shaded region is :

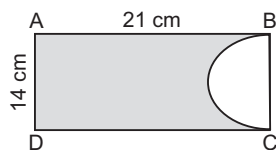


- (a) $\frac{17}{2} \text{ cm}^2$ (b) $\frac{19}{2} \text{ cm}^2$
 (c) $\frac{21}{2} \text{ cm}^2$ (d) $\frac{23}{2} \text{ cm}^2$
31. From a rectangular sheet of paper ABCD with $AB = 40$ cm and $AD = 28$, a semi-circular portion with BC as diameter is cut off. Then the area of the remaining paper :
 (a) 612 cm^2 (b) 732 cm^2 (c) 812 cm^2 (d) 902 cm^2
32. Two circular pieces of equal radii and maximum area, touching each other are cut from a rectangular cardboard of dimensions 14 cm, 7 cm. Then the area of the remaining cardboard is :
 (a) 17 cm^2 (b) 19 cm^2 (c) 21 cm^2 (d) 23 cm^2

33. In the figure, the area of the shaded region, enclosed between two concentric circles of radii 7 cm and 14 cm, where, $\angle AOC = 40^\circ$ is :

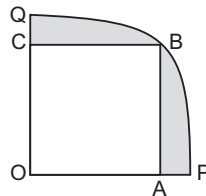


- (a) $\frac{1232}{3} \text{ cm}^2$ (b) $\frac{1532}{3} \text{ cm}^2$
 (c) $\frac{1792}{3} \text{ cm}^2$ (d) $\frac{1798}{3} \text{ cm}^2$
34. In the given figure, ABCD is rectangle of dimensions 21 cm $\times$ 14 cm. A semi-circle is drawn with BC as diameter. The perimeter of the shaded region is :
 (a) 80 cm (b) 79 cm
 (c) 78 cm (d) 77 cm



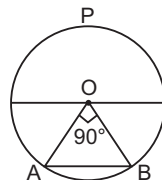
35. In the figure, a square OABC is inscribed in a quadrant OPBQ of a circle. If $OA = 20$ cm, the area of the shaded region is :

- (a) 226 cm^2 (b) 230 cm^2
(c) 228 cm^2 (d) 215 cm^2



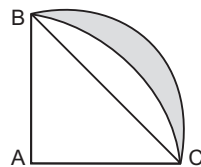
36. The area of the major segment APB of a circle of radius 35 cm and $\angle AOB = 90^\circ$ is :

- (a) 2400 cm^2 (b) 2600 cm^2
(c) 2900 cm^2 (d) 3500 cm^2



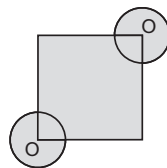
37. In the figure, ABC is the quadrant of a circle of radius 14 cm and a semi-circle is drawn with BC as the diameter. The area of the shaded region =

- (a) 106 cm^2 (b) 100 cm^2
(c) 98 cm^2 (d) 90 cm^2



38. In the figure, the side of square is 28 cm and radius of each circle is half of the length of the side of the square, where O and O' are centres of the circles. The area of the shaded region =

- (a) 1205 cm^2 (b) 1508 cm^2
(c) 1708 cm^2 (d) 1928 cm^2



II. FILL IN THE BLANKS

- The perimeter of a circle is also known as its _____.
- The perimeter of a semi-circle of radius r is given by _____.
- For a circle the ratio of circumference to diameter is called _____.
- Length of an arc of a sector of a circle of radius r and angle 100° is _____.
- Area of the sector of a circle of diameter $4r$ and angle θ is given by _____.
- The perimeter of a sector of a circle of radius r and central angle θ is _____.
- Area of a ring with outer and inner radii R and r respectively is _____.
- If the areas of two circles are equal, then their circumferences are _____.
- Area of minor segment of a circle of radius r with central angle θ is given by _____.
- The circumference of a circle is 100 cm. The side of a square inscribed in the circle is _____.

III. VERY SHORT ANSWER QUESTIONS

- Find the area of a quadrant of a circle whose circumference is 50 cm.
- The length of the minute hand of a clock is 14 cm. Find the area swept by minute hand in 10 minutes.
- Find the diameter of a circle whose area is equal to the sum of areas of the two circles of radii 40 cm and 9 cm.
- If the area and circumference of a circle are numerically equal, then find the diameter of

the circle.

5. Find the area of a circle that can be inscribed in a square of side 14 cm.
6. Two parallel lines touch a circle at points P and Q. If the area of the circle is $25\pi \text{ cm}^2$, find the length of PQ.
7. A path of width 7 m runs around a circular park whose radius is 18 cm. Find the area of the path.
8. Find the ratio of area of a circle circumscribing a square of side 5 cm to the area of a circle inscribed in the same square.
9. A wire of length 110 cm is bent to form a circle. Find the radius of the circle so formed.
10. Find the diameter of the circle whose area is equal to the sum of the areas of two circles of diameter 20 cm and 48 cm.

ANSWERS

I. Multiple Choice Questions :

- | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (c) | 2. (a) | 3. (b) | 4. (a) | 5. (b) | 6. (a) | 7. (b) | 8. (a) |
| 9. (d) | 10. (b) | 11. (c) | 12. (d) | 13. (c) | 14. (c) | 15. (b) | 16. (a) |
| 17. (d) | 18. (b) | 19. (b) | 20. (d) | 21. (a) | 22. (d) | 23. (b) | 24. (c) |
| 25. (a) | 26. (b) | 27. (d) | 28. (c) | 29. (b) | 30. (c) | 31. (c) | 32. (c) |
| 33. (a) | 34. (c) | 35. (c) | 36. (d) | 37. (c) | 38. (c) | | |

II. Fill in the Blanks :

- | | | | | |
|--|---------------------|----------|---|---|
| 1. Circumference | 2. $\pi r + 2r$ | 3. π | 4. $\frac{5\pi r}{9}$ | 5. $\frac{\pi r^2 \times \theta}{90^\circ}$ |
| 6. $2r + \frac{\pi r \theta}{180^\circ}$ | 7. $\pi(R^2 - r^2)$ | 8. equal | 9. $\frac{\pi r^2 \theta}{360^\circ} - \frac{1}{2} r^2 \sin \theta$ | 10. $\frac{50\sqrt{2}}{\pi}$ |

III. Very Short Answer Questions :

- | | | | | |
|-----------------------|---------------------------------|----------|------------|-----------------------|
| 1. 154 cm^2 | 2. $\frac{308}{3} \text{ cm}^2$ | 3. 82 cm | 4. 4 units | 5. 154 cm^2 |
| 6. 10 cm | 7. 946 cm^2 | 8. 2 : 1 | 9. 17.5 cm | 10. 52 cm |