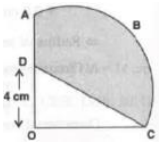
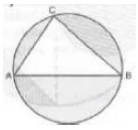
Ch-11 Areas Related to Circles

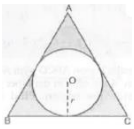
1. In the figure, OABC is a quadrant of a circle of radius 7 cm. If OD = 4 cm, find the area of the shaded region. $\left[Use\ \pi = \frac{22}{7}\right]$.



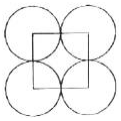
2. A chord of a circle of radius 20 cm subtends an angle of 90^o at the centre. Find the area of the corresponding major segment of the circle.
3. Area of a sector of a circle of radius 36 cm is 54π cm^2. Find the length of the corresponding arc of the sector.
4. In the figure, AB is a diameter of the circle, AC = 6 cm and BC = 8 cm. Find the area of the shaded region. [Use $\pi = 3.14$].



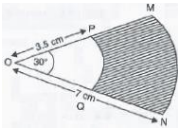
5. A calf is tied with a rope of length 6 m at the corner of a square grassy lawn of side 20 m. If the length of the rope is increased by 5.5 m, find the increase in area of the grassy lawn in which the calf can graze.
6. In the figure, a circle is inscribed in an equilateral ΔABC of side 12 cm. Find the radius of the inscribed circle and the area of the shaded region. [Use $\pi = 3.14$ and $\sqrt{3} = 1.73$].



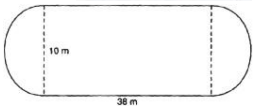
7. The area of an equilateral triangle is $49\sqrt{3}$ cm^2. Taking each angular point as centre, circles are drawn with radius equal to half length of the side of the triangle. Find the area of triangle not included in the circles.
8. Four equal circle are described about the four corners of a square so that each touches 2 of the others, as shown in the figure. Find the area of the shaded region, each side of the square measuring 14 cm.



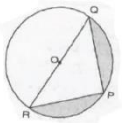
9. In the figure, MN and PQ are the arcs of two concentric circles of radii 7 cm and 3.5 cm respectively and ∠MON = 30^o. Find the area of the shaded region.



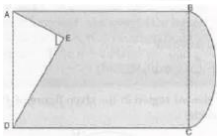
10. A play ground is in the form of a rectangle having semi-circles on the shorter sides as shown in the figure. Find its area when the length of the rectangular portion is 38 m and the breadth is 10 m. [use $\pi = 3.14$].



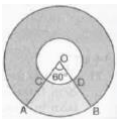
11. A bicycle wheel makes revolutions per minute to maintain a speed of 8.91 km per hour. Find the diameter of the wheel.
12. Find the area of the shaded region in the given figure, if PQ = 24 cm, PR = 7 cm and O is the centre of the circle.



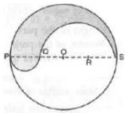
13. In the figure, from a rectangular region ABCD with AB = 20 cm, a right ΔAED with AE = 9 cm and DE = 12 cm, is cut off. On the other end, taking BC as diameter, a semi-circle is added on outside the region. Find the area of the shaded region.



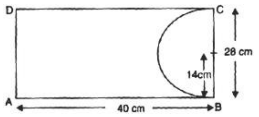
14. In the figure, 2 concentric circles with centre O, have radii 21 cm and 42 cm. If ∠AOB = 60^o, find the area of the shaded region. $\left[Use\ \pi = \frac{22}{7}\right]$.



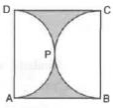
15. PQRS is a diameter of a circle of radius 6 cm. The equal lengths PQ, QR and RS are drawn on PQ and QS as diameters, as shown in figure. Find the perimeter of the shaded region.



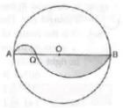
16. A sheet of paper is in the form of a rectangle ABCD in which AB = 40 cm, and BC = 28 cm. A semi-circular portion with BC as diameter is cut off. Find the area of the remaining paper.



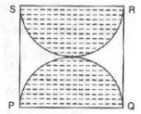
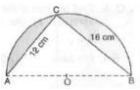
17. Find the area of the shaded region in the figure, if ABCD is a square of side 14 cm and APD and BPC are semi-circles.



18. Find the area of the shaded region of the following figure, if the diameter of the circle with centre O is 28 cm and AQ = $\frac{1}{4}$ AB.



19. PQRS is a square land of side 28 m. Two semi-circular grass covered portions are to be made on two of its opposite sides as shown in the figure. How much area will be left uncovered?



20. In the given figure, O is the centre of a circular arc and AOB is a straight line. Find the perimeter of the shaded region.