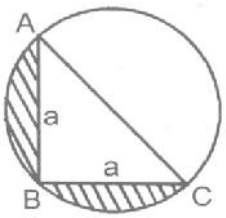
Chapter 12

ASSIGNMENT

OBJECTIVE EXCERCISE - 12.1

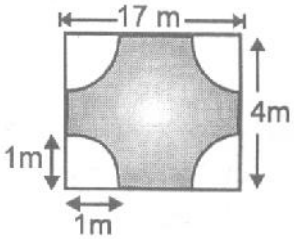
1. If BC passed through the centre of the circle, then the area of the shaded region in the given figure is



(A) $\frac{a^2}{2}(3-\pi)$ (B) $a^2\left(\frac{\pi}{2}-1\right)$

(C) $2a^2(\pi-1)$ (D) $\frac{a^2}{2}\left(\frac{\pi}{2}-1\right)$

2. The perimeter of the following shaded portion of the figure is:



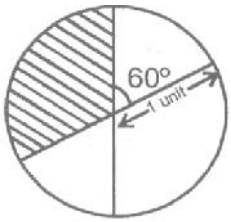
(A) 40 m (B) 40.07 m

(C) 40.28 m (D) 35 m

3. If a rectangle of sides 5 cm and 15 cm is be divided into three squared of equal area, then the sides of the squares will be :

(A) 4 cm (B) 6 cm (C) 7 cm (D) None

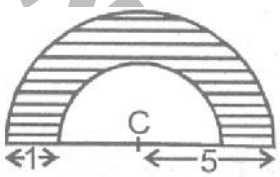
4. The area of the shaded region in the given figure is :



(A) $\frac{\pi}{3}$ sq. units (B) $\frac{\pi}{2}$ units

(B) $\frac{\pi}{4}$ sq. units (D) π^2 sq. units

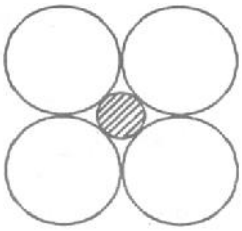
5. The area of the shaded portion in the given figure is :



(A) 7.5 π sq. units (B) 6.5 π sq. units

(C) 5.5 π sq. units (D) 4.5 π sq. units

6. In the adjoining figure, the radius of the inner circle, if other circles are of radii 1 m, is :



(A) $\left(\sqrt{2}-1\right)$m (B) $\sqrt{2}$ m

(C) $\frac{1}{\sqrt{2}}$ m (D) $\frac{2}{\sqrt{2}}$ m

7. The height of a conical tent of the centre is 5cm. The distance of any point on its circular base from the top of the tent is 13m. The area of the slant surface is :

(A) 144 π sq m (B) 130 π sq m (C) 156 π sq m (D) 169 π sq m

8. The radius of circle is increased by 1 cm, then the ratio of the new circumference to the new diameter is :

(A) $\pi + 2$ (B) $\pi + 1$ (C) π (D) $\pi - \frac{1}{2}$

9. A hemispherical bowl of internal diameter 36 cm is full of some liquid. This liquid is to be filled in cylindrical bottles of radius 3 cm and height 6 cm., Then no of bottles needed to empty the bowl.

(A) 36 (B) 75 (C) 18 (D) 144

10. There is a cylinder circumscribing the hemisphere such that their bases are common. The ratio of their volume is

(A) 1 : 3 (B) 1 : 2 (C) 2 : 3 (D) 3 : 4

11. A sphere of radius 3 cms is dropped into a cylindrical vessel of radius 4 cms. If the sphere is submerged completely, then the height (in cm) to which the water rises, is

(A) 2.35 (B) 2.30 (C) 2.25 (D) 2.15

12. If a rectangular sheet of paper 44 cm × 22 cm is rolled along its length of form a cylinder, then the volume of cylinder in cm^3 is

(A) 1694 (B) 3080 (C) 3388 (D) none of these

13. Two cones have their heights in the ratio 1 : 3 and the radii of their bases are in the ratio 3 : 1 , then the ratio of their volumes is

(A) 1 : 3 (B) 27 :1 (C) 3 : 1 (D) 1 : 27

14. The total surface area of a cube is numerically equal to the surface area of a sphere then the ratio of their volume is

(A) $\frac{\pi}{6}$ (B) $\sqrt{\frac{\pi}{6}}$ (C) $\frac{\pi}{216}$ (D) $\sqrt{\frac{6}{\pi}}$

15. A cone is dived into two parts by drawing a plane through the mid point of its axis parallel to its base then the ratio of the volume of two parts is

(A) 1 : 3 (B) 1 : 7 (C) 1 : 8 (D) 1 : 9

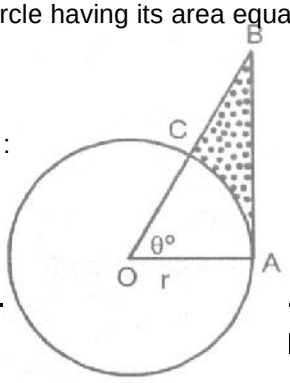
SUBJECTIVE EXCERCISE - 12.2

1. The area of a circle inscribed in an equilateral triangle is 154 cm^2. Find the perimeter of the triangle.

2. The radii of two circles are 8 cm and 6 cm respectively. Find the radius of the circle having its area equal to the sum of the areas of the two circles.

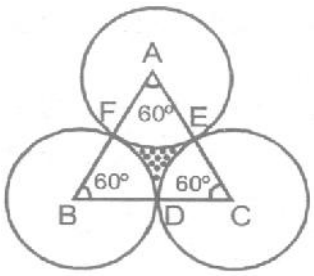
3. **Figure,** shows a sector of a circle, centre O, containing an angle θ^0 . Prove that :

(i) Perimeter of the shaded region is r $\left(\tan\theta + \sec\theta + \frac{\pi\theta}{180} - 1\right)$

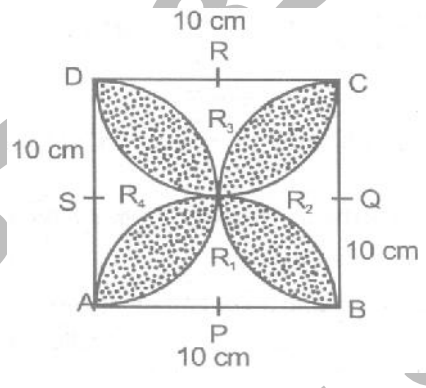


(ii) Area of the shaded region is $\frac{r^2}{2}\left(\tan\theta - \frac{\pi\theta}{180}\right)$

4. The area of an equilateral triangle is $49\sqrt{3}$ cm^2. Taking each angular point as centre, a circle is described with radius equal to half the length of the side of the triangle as shown in **figure.** Find the area of the triangle not included in the circle.



5. Find the area of the shaded region in **figure.** where ABCD is a square of side 10 cm. (use π = 3.14)



6. A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface of the remainder is $\frac{8}{9}$ of the curved surface of whole cone, find the ratio of the line - segment into which the cone's altitude is divided by the plane.

7. A right - angled triangle whose sides are 15 cm and 20 cm, is made to revolve about its hypotenuse. Find the volume and the surface area of the double cone so formed. [Take $\pi \cong$ 3.14]

8. 50 persons took dip in a rectangular tank which is 80 m long and 50 m broad. What is the rise in the level of water in the tank, if the average displacement of water by a person is 0.04 m^3?

9. Water is flowing at the rate of 5 km per hour through a pipe of diameter 14 cm into a rectangular tank, which is 50 m long and 44 m wide. Find the time in which the level of water in the tank will rise by 7 cm.

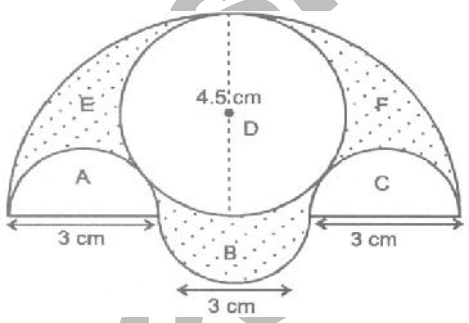
10. A circus tent is cylindrical to a height of 3 m and conical above it. If its base radius is 52.5 m and slant height of the conical portion is 53 m, find the area of the canvas needed to make the tent.

11. The diameters external and internal surfaces of a hollow spherical shell are 10 cm and 6 cm respectively. If it is melted and recast into a solid cylinder of length of $2\frac{2}{3}$ cm, find the diameter of the cylinder.

12. A cylindrical container of radius 6 cm and height 15 cm is fulled with ice-cream. The whole ice-cream has to be distributed to 10 children in equal cones with hemispherical tops. If the height of the conical portion is four times the radius of its base, find the radius of the ice-cream cone.

13. A hemi-spherical depression is cutout from one face of the cubical wooden block such that the diameter ℓ of the hemisphere is equal to the edge of the cube., Determine the surface are of the remaining solid.

14. In **figure** there are three semicircles, A,B and C having diameter 3 cm each, and another semicircle E having a circle D with diameter 4.5 cm are shown. Calculate.
(i) the area of the shaded region
(ii) the cost of painting the shaded region of the 25 paisa per cm^2, to the nearest rupee.



15. The height of a cone is 30 cm. A small cone is cut off at the top by a plane parallel to the base. If its volume be $\frac{1}{27}$ of the volume of the given cone, at what above the vase is the section made ?

16. A solid cylinder of diameter 15 cm and height 15 cm is melted and recast into 12 toys in the shape of a right circular cone mounted on a hemisphere. Find the radius of the hemisphere and the total height of the to if height of the conical par is 3 times its radius. **[CBSE - 2005]**

17. if the rail of the ends of bucket, 45 cm high are 28 cm and 7cm, determine the capacity and total surface area of the bucket. **[CBSE - 2006]**

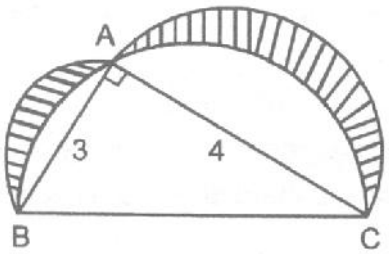
18. A tent is in the form of cylinder of diameter 4.2 m and height 4 m, surmounted by a cone of equal base and height 2.8 m. Find the capacity of the tent and the cost of canvas for making the tent at Rs. 100 per sq. m. ? **[CBSE - 2006]**

19. Water flows out through a circular pipe whose internal radius is 1 cm, at the rate of 80 cm/second into an empty cylindrical tank, the radius of whose base is 40 cm. By how much will the level of water rise in the tank in half an hour ? **[CBSE - 2007]**

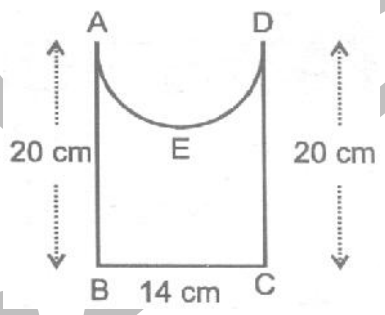
20 A hemispherical bowl of internal radius 36 cm is full of liquid. The liquid is to be filled into cylindrical shaped small bottles each of diameter 3 cm and height 6 cm. How many bottles are need to empty the bowl ? **[CBSE - 2007]**

21 In figure ABC is a right - angled triangle right-angled at A. Semicircles are drawn on AB, AC and BC as diameters. Find the area of the shaded region.

[CBSE - 2008]



22. Find the permetre of figure , where $\overset{\frown}{AED}$ is a semi-circle and ABCD is a rectangle. **[CBSE - 2008]**



23. A tent consists of a frustum of a cone, surmounted by a cone. If the diameters of the upper and lower circular ends of the frustum b 14 m and 26 m respectively, the height of the frustum be 8 m and the slant height of the surmounted conical portion be 12 m, find the area of canvas required to make the tent. (Assume that the radii of the upper circular end of the frustum and the base of surmounted conical portion are equal) **[CBSE - 2008]**