

Class 10 Volume surface and Area

1. A solid iron rectangular block of dimensions 4.4 m, 2.6m, and 1m is cast into a hollow cylindrical pipe of internal radius 30cm and thickness 5cm. Find the length of the pipe. (Use $\pi = 22/7$) (Ans = 112m)
2. A well with inside diameter 7m, has been dug 22.5m deep and the earth dug out is used to form an embankment around it. If the height of the embankment is 1.5m, find the width of the embankment. (Ans = 10.5m)
3. Water is flowing at the rate of 7m/ sec through a circular pipe whose internal diameter is 2cm, into a cylindrical tank of radius 40cm. Find the increase in water level in $\frac{1}{2}$ hour. (Ans = 7.875m)
4. Water is flowing at 5km/hr through a pipe of diameter 14cm into a rectangular tank which is 50m long and 44m wide. Find the time in which the water level in the tank rises by 7cm. (Ans = 2 hours)
5. Water flows @ 10 m/ min through a cylindrical pipe having its diameter as 5mm. How much time will it take to fill a conical vessel whose diameter of base is 40cm and depth 24cm? (Ans = 51min 12sec)
6. The radii of the internal and external surfaces of a metallic spherical shell are 3cm and 5cm respectively. It is melted and recast into a solid right circular cylinder of height $32/3$ cm. Find the diameter of the base of the cylinder. (Ans = 7cm)
7. The radius of a solid iron sphere is 8cm. 8 rings of iron plate of external radius $20/3$ cm and the thickness 3cm are made by melting this sphere. Find the internal diameter of each ring. (Ans = 8cm)
8. A tent of height 77dm is in the form of a right circular cylinder of diameter 36m and height 44dm surmounted by a right circular cone. Find the cost of canvas at Rs 3.50/m² (Ans = Rs. 5365.80)
9. A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of hemisphere is 4.2cm and the total height of the toy is 10.2cm, find the volume of the wooden toy. (Ans = 266.11cm³)
10. A cylindrical container of radius 6cm & height 15cm is filled 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 4 times the radius of its base, find the radius of the cone. (Ans = 3cm)
11. A solid is composed of a cylinder with hemispherical ends. If whole length of the solid is 98cm and diameter of cylinder is 8cm, find the total surface area & volume of the given solid . (Ans = 8624cm² , 54618.67cm³)
12. A right triangle whose sides are 15cm and 20cm, is made to revolve about its hypotenuse. Find the volume and total surface area of the double cone so formed. (Use $\pi = 3.14$). (Ans 3768cm³, 318.8cm²)
13. A cylindrical road roller made of iron is 1m long. Its internal diameter is 54cm and the thickness of iron sheet used in making the roller is 9cm. find the mass of the roller, if 1cm³ of iron has 8gm mass. (Ans = 1425.6kg)
14. The difference between outside and inside surface areas of a metallic cylindrical

pipe 14cm long is 44cm² if the pipe is made of 99cm³ of metal, find the outer and inner radii of the pipe. (Ans = 2.5cm, 2cm)

15. A bucket is in the form of a frustum of a cone and holds 28.49 litres of water. The radii of the top and bottom are 28cm, 21cm respectively. Find the height of the bucket. (Ans = 15cm)

16. The perimeters of ends of a frustum are 48cm & 36cm, if height of frustum be 11cm, find its volume. (Ans = 1554cm³)

17. 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 height above the base is the section made? (Ans = 20cm)

18. A tent is made in form of a conic frustum surmounted by a cone. The diameters of base and top of frustum are 20m & 6m respectively and height is 24m. If height of the tent is 28m, find the area of the canvas cloth required. (Ans = 340 π m²)

19. A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface area of the remainder is $\frac{8}{9}$ of the curved surface of the whole cone, find the ratio of the line segments into which the cone's altitude is divided by the plane (Ans = 1:2)

20. A cylinder and a cone have equal bases and equal heights. If their curved surfaces are in the ratio 8:5, determine the ratio of the radius of the base to the height of either of them (Ans = 3:4)

21. Lead spheres of diameter 6cm are dropped into a cylindrical beaker containing some water and are completely submerged. If the diameter is 18cm and the water rises by 40cm, find the number of lead spheres dropped in the water. (Ans = 90)

22. A circus tent is cylindrical to a height of 3m and conical above it. If its diameter is 105m and the slant height of the conical portion is 53m, calculate the length of the canvas cloth 5m wide required to make the tent. (Ans = 1947m)

23. A cone, a hemi-sphere and a cylinder stand on equal bases and have the same height. Find the ratio of their volumes as well the ratio of their total surface areas (Ans = 1:2:3, $(\sqrt{2} + 1):3:4$)

24. A cone of radius 10cm is divided into two parts by drawing a plane through the mid-point of its axis parallel to its base. Find the ratio of the volumes of the two parts of the cone (Ans = 1:7)

25. A building is in the shape of a cylinder surmounted by a hemi-spherical vaulted dome. The internal diameter of the building is equal to the total height of the building. If the volume of air space inside the building is $\frac{880}{21}$ m³, find the height of the crown of the vault above the floor. (Ans = 4m)

26. An inverted cone of vertical height 12cm and radius of the base 9cm has water to a depth of 4cm. Find the area of the internal surface of the cone not in contact with water. (Ans = 376.8cm²)

27. The mass of a spherical iron shot-put 12cm in diameter is 5kg. Find the mass of a hollow cylindrical pipe 12cm long (made of the same metal), if its internal and external diameters are 20cm and 22cm, respectively. (Ans = 4.375kg)