



Class – X

**CHAPTER – SURFACE AREAS
AND VOLUMES**

SUBJECT – MATHEMATICS

1. Volume and surface area of a solid hemisphere are numerically equal. What is the diameter of the hemisphere?
2. A cylinder, a cone and a hemisphere have same base and same height. Find the ratio of their volumes?
3. Find the volume of the largest cone that can be cut out of a cube whose edge is 7 cm.
4. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the volume of the remaining solid.
5. How many metres of 5m wide cloth will be required to make a conical tent, the radius of whose base is 7 m and whose height is 24 m ?
6. A copper wire 3 mm in diameter is wound about a cylinder whose length is 1.2 m and diameter 10 cm so as to cover the curved surface of the cylinder. Find the length of the wire used.
7. A warehouse is used as a granary. It is in the shape of a cuboid surmounted by half cylinder. The base of the warehouse is 6 m X 14 m and its height is 8 m. Find the surface area of the ware house.
8. Wax cylinder of diameter 21 cm and height 21 cm is chipped off and shaped to form a cone of maximum volume. The chipped off wax is recast into a solid sphere. Find the diameter of the sphere.
9. A solid right cylinder is 18 cm high and the radius of the base is 7 cm. Two equal right cones are drilled on the plane faces of the cylinder, the height of each cone being one-third the height of the cylinder and the radius of the base of each cone being equal to the base of the cylinder. Find the total surface area of the remaining solid.
10. A toy is in the form of a hemisphere surmounted by a right circular cone of the same base radius as that of the hemisphere. If the radius of base of the cone is 21 cm and its volume is two-third of the volume of the hemisphere, calculate the height of the cone and the area of the toy.
11. Two solid cones are placed in a cylindrical tube of height 21 cm and radius 6 cm. The ratio of their capacities is 2 : 1. Find the heights and capacities of the cones. Also, find the volume of the remaining portion of the cylinder.
12. Water is flowing through a cylindrical pipe, of internal diameter 2 cm, into a cylindrical tank of base radius 40 cm, at the rate of 0.4 m/s. Determine the rise in level of water in the tank in half an hour.
13. A solid right circular cone of diameter 14 cm and height 8 cm is melted to form a hollow sphere. If external diameter of the sphere is 10 cm, find the internal diameter of the sphere.

14. A bucket of height 8 cm and made up of copper sheet is in the form of frustum of a right circular cone with radii of its lower and upper ends as 3 cm and 9 cm respectively. Calculate:
- the height of the cone of which the bucket is a part.
 - the volume of water which can be filled in the bucket.
 - the area of copper sheet required to make the bucket.
15. A cone is divided into two parts by drawing a plane through the midpoint of its axis parallel to its base. Compare the volume of the two parts into which the plane divides the cone.
16. A conical vessel of radius 6 cm and height 8 cm is completely filled with water. A sphere is lowered into the water and its size is such that when it touches the sides it is just immersed. What fraction of the water overflows?
17. The difference between the outer and inner curved surface area of a hollow right circular cylinder, 14 cm long is 88 cm^2 . If the volume of metal used in making the cylinder is 176 cm^3 , find the outer and inner diameters of the cylinder.
18. A tent is of the shape of a right circular cylinder upto a height of 3 m and conical above it. The total height of the tent is 13.5 m above the ground. Calculate the cost of painting the inner side of the tent at the rate of ₹ 2 per square metre, if the radius of the base is 14 m.
19. The rain water from a roof 22 m X 20 m drains into a conical vessel having the diameter of base as 2m and height 3.5 m. If the vessel is just full, find the rainfall in mm.
20. An iron pillar has some part in the form of a right circular cylinder and the remaining in the form of a right circular cone. The radius of the base of each the cone and the cylinder is 8 cm. The cylindrical part is 240 cm high and the conical part is 360 cm high. Find the weight of the pillar if 1 cu. cm of iron weighs 7.5 grams.

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