

SURFACE AREAS AND VOLUMES

- Q1. Is $V = ab + c$ correct formula. Justify.
- Q2. What is the number of surfaces of a right circular cylinder?
- Q3. Find the ratio of the surface area and volume of the sphere of unit radius. Ans: 3:1
- Q4. A cube and a sphere are of the same height. Find the ratio of their volume. Ans: 6:π
- Q5. The surface area of cuboid is 1792 sq cm if its length, breadth and height are in the ratio 4:2:1 then find the length of cuboid. Ans: 32 cm
- Q6. If the radius of the cylinder is doubled and height is halved, then show that the volume will be doubled.
- Q7. A cone, a hemisphere and a cylinder stand on equal bases and have the same height. Find the ratio of their volume. Ans: 1:2:3
- Q8. Prove that the volume of the largest right circular cone that can be fitted in a cube having edge $2r$ equals to the volume of a hemisphere of radius r .
- Q9. Find the length of the longest rod that can be placed in a room 12m x 9m x 8m. Ans: 17m
[Hint: Diagonal of the room = $\sqrt{a^2 + b^2 + c^2}$]
- Q10. A storage tank is in the form of a cube. When it is full of water, the volume of water is 15.625 m³. If the present depth of water is 1.3 m, find the volume of water already used from the tank. Ans: 7.5 m³

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Q11. The radius and slant height of a cone are in the ratio 4:7. If its curved surface area is 792 cm^2 , find its radius. Ans: 12 cm.

Q12. A cylinder and a cone have equal heights and equal radii of their bases. If their curved surface areas are in the ratio 8:5. Show that the ratio of radius to height of each is 3:4.

Q13. The diameter of a sphere is decreased by 25%. By what percent its surface area decrease? Ans: 43.75%.

Q14. If V is the volume of a cuboid of dimensions l, b, h and S is its surface area, then prove that $\frac{1}{V} = \frac{2}{S} \left(\frac{1}{l} + \frac{1}{b} + \frac{1}{h} \right)$.

Q15. 30 circular plates, each of radius 14 cm and thickness 3 cm are placed one above the another to form a circular solid. Find

(i) the total surface area Ans: 9152 cm^2

(ii) volume of the cylinder so formed Ans: 55440 cm^3

Q16. The radius and height of a cone are in the ratio 3:4 and its volume is 301.44 cm^3 . Find the radius and slant height of the cone.

Ans: Radius: 6 cm, Slant height: 10 cm

Q17. A shopkeeper has one spherical laddoo of radius 5 cm. With the same amount of material, how many laddoos of radius 2.5 cm can be made? Ans: 8

Q18. A sphere and a right circular cylinder of the same radius have equal volumes. By what percentage does the diameter of the cylinder exceeds its height? Ans: 50%.

Q19. A cylinder, a cone and a sphere are of the same radius and same height. Find the ratio of

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Q20. A cloth having an area of 165 m^2 is shaped into the form of a conical tent of radius 5 cm .

(i) How many students can sit in the tent if a student on an average, occupies $\frac{5}{7} \text{ m}^2$ on the ground. Ans: 110

(ii) Find the volume of the cone. Ans: 241.74 m^3

Q21. The volume of two spheres are in the ratio $64:27$. Find the ratio of their surface areas.

Ans: $16:9$

Q22. The diameter of a sphere is decreased by 25% . By what percent does its curved surface area decrease? Ans: 43.75% .

Q23. The surface area of a sphere of radius 5 cm is five times the curved surface area of a cone of radius 4 cm . Find the height and volume of the cone. Ans: 3 cm ; 50.29 cm^3

Q24. In a cylinder, if radius is halved and height is doubled, what will happen to volume?

Q25. What will be the total surface area of a cone whose radius is $\frac{r}{2}$ and slant height is $2l$?

Q26. Write True or False:

(a) The volume of a sphere is equal to two-third of the volume of a cylinder whose height and diameter are equal to the diameter of sphere.

(b) A cylinder and a right circular cone are having the same base and same height. The volume of the cylinder is three times the volume of the cone.

(c) A cone, a hemisphere and a cylinder stand on equal bases and have the same height. The ratio of their volumes is $1:2:3$.

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(1) If a sphere is inscribed in a cube, then the ratio of the volume of the cube to the volume of the sphere will be $6 : \pi$.

Q 27. Two solid spheres made of the same metal have weights 5920 g and 740 g resp. Determine the radius of the larger sphere, if the diameter of the smaller one is 5 cm. Ans: 5 cm.

Q 28. A semi-circular sheet of metal of diameter 28 cm is bent to form an open conical cup. Find the capacity of the cup. Ans: 677.6 cm^3

Q 29. The water for a factory is stored in a hemispherical tank whose internal diameter is 14 m. The tank contains 50 kilolitres of water. Water is pumped into the tank to fill to its capacity. Calculate the volume of water pumped into the tank. Ans: 668.66 m^3 .

Q 30. A right triangle with sides 6 cm, 8 cm and 10 cm is revolved about the side 8 cm. Find the volume and the curved surface area of the solid so formed. Ans: 304 cm^3 , 188.5 cm^2 .