MATHS

BOOKS - R G PUBLICATION

SURFACE AREA AND VOLUMES

Example

1. Find the volume and the surface area of a cuboid of length 30cm.,breadth 25 cm.and height 15 cm.

Watch Video Solution

2. Three solid metallic cubes of edges 6 cm.,8 cm.and 10 cm.respectivelt are melted to form a new cube.Find the volume and the surface area of the newly formed cube.

Watch Video Solution

3. Find the surface area of a cuboid formed by placing three cubes of side 5 cm on one

another.

Watch Video Solution

4. How many regular pieces of wood of length 2m.breadth 2.5cm and thickness 4 cm.can be obtained from a log of wood of length 6m.,breadths 15cm and thickness 40 cm.?

Watch Video Solution

5. The soil dug out from a plot of land of length 50m and breadth 40m to a depth of 7m was evenly spread out over a plot of land of size $200m \times 150m$.Find the increased height of the second plot of land as a result of the spreading out of the soil.

Watch Video Solution

6. Four squares of side 8cm each were cut out from the four corners of a rectangular metal

sheet of size$48cm \times 36cm$.Find the volume of the open cuboid formed with the remaining portion of the metal sheet.

Watch Video Solution

7. When measured from outside,the length,breadth and height of a top-open metal box of thickness 0.5cm.were found to be 10cm.,9cm and 2.5cm respectively.Find the volume of the metal needed to make the box and the capacity of the box as well.

Watch Video Solution

8. The length of a cuboidal refrigerator is twice its breadth and its height is 3m.If the area of the four walls including the door of the refrigerator is $105cm^2$ then find the volume of the refrigerator.

Watch Video Solution

9. How many cubic meters of soil shall be taken out while digging a well of depth of

22.5m and diameter 7m.?Also find the total cost of cementing the curved surface inside the well at the cost of Rs.20 per square metre.

Watch Video Solution

10. The ratio of the radii of two cylinders is 2:3 and the ratio of their heights is 5:3.Find the ratios of their volumes and their curved surfaces.

Watch Video Solution

11. The total surface area of the solid cylinder is $462cm^2$.If the area of the curved surface of the cylinder is one-third of the total surface area,then find the volume of the cylinder.

Watch Video Solution

12. Find the volume of a cylinder made from a rectangular sheet of size $44cm \times 20cm$ by bending it along its length.

Watch Video Solution

13. The ratio of the radius and the slant height of a cone is 4:7 and the area of its curved surface is $792cm^2$.Find the radius of the cone.

Watch Video Solution

14. How many meters of cloth 5m wide are needed to make a conical tent of base radius 7 m and height 24 m?

Watch Video Solution

15. The area of the curved surface of 24 cm.high cone is $550cm^2$.Find the volume of the cone.

Watch Video Solution

16. A cylinder and a cone are of equal base radii and heights.If the ratio of the areas of their curved surfaces is 8:5,show that the ratio of the radius and the height of each of the two is 3:4.

Watch Video Solution

17. Find the volume and the surface area of a sphere of radius 5.6 cm.

Watch Video Solution

18. If the surface area of a sphere is $5544cm^2$ .Find its diameter.

Watch Video Solution

19. If the radius of one sphere is double the radius of another sphere,then find the ratio of the volumes of the spheres.

Watch Video Solution

20. The height of a cylinder is two-thirds of its diameter and the volume of the cylinder is equal to the volume of a sphere of radius 4 cm.Find the base radius of the cylinder.

Watch Video Solution

21. Find how many spherical cartridges of diameter 4.2 cm.each can be made from a solid cuboid of size $66cm \times 42cm \times 21cm ? = 58212cm^3$

Watch Video Solution

22. How many coins of diameter 1.5 cm and thickness 0.2 cm can be made by melting a right circular metallic solid cylinder of height 10 cm and diameter 4.5cm?

Watch Video Solution

23. From a solid cylinder of height 2.4 cm and diameter 1.4 cm a cone of the same height and same diameter is cut out.Find the total surface area of the remaining portion of the cylinder.

Watch Video Solution

24. When a conical toy of base radius 3.5 cm is placed on a hemisphere of the same radius

,the total height of the toy becomes 15.5cm.Find the total surface area of the toy.

Watch Video Solution

Exercise

1. 2 cubes each of volume $64cm^3$ are joined end to end.Find the surface area of the resulting cuboid.

Watch Video Solution

2. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder.The diameter of the hemisphere is 14 cm and the height of the vessel is 13 cm.Find the inner surface area of the vessel.

Watch Video Solution

3. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius.The total height of the toy is 15.5 cm.Find the total surface area of the toy.

Watch Video Solution

4. A cubical block of side 7 cm is surmounted by a hemisphere.What is the greatest diameter the hemisphere can have?Find the surface area of the solid.

Watch Video Solution

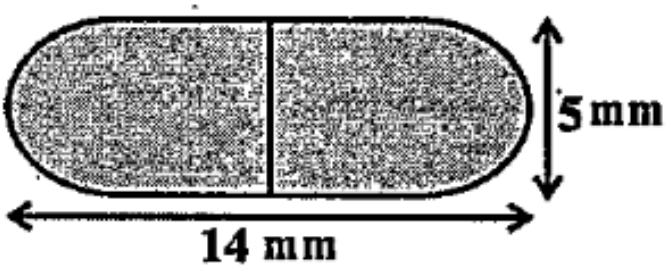
5. A hemispherical depression is cut out from one face of a cubical wooden block such that

the diameter of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.

Watch Video Solution

6. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends(see Fig.13.10).The length of the entire capsules is 14mm and the diameter of

the capsule is 5 mm.Find its surface area.



Watch Video Solution

7. A tent is in the shape of a cylinder surmounted by a conical top.If the height and diameter of the cylindrical part are 2.1m and 4 m respectively,and the slant height of the top is 2.8 m,find the area of the canvas used for

making the tent.Also find the cost of the canvas of the tent at the rate of $Rs.500 per m^2$ (Note that the base of the will not be covered with canvas).

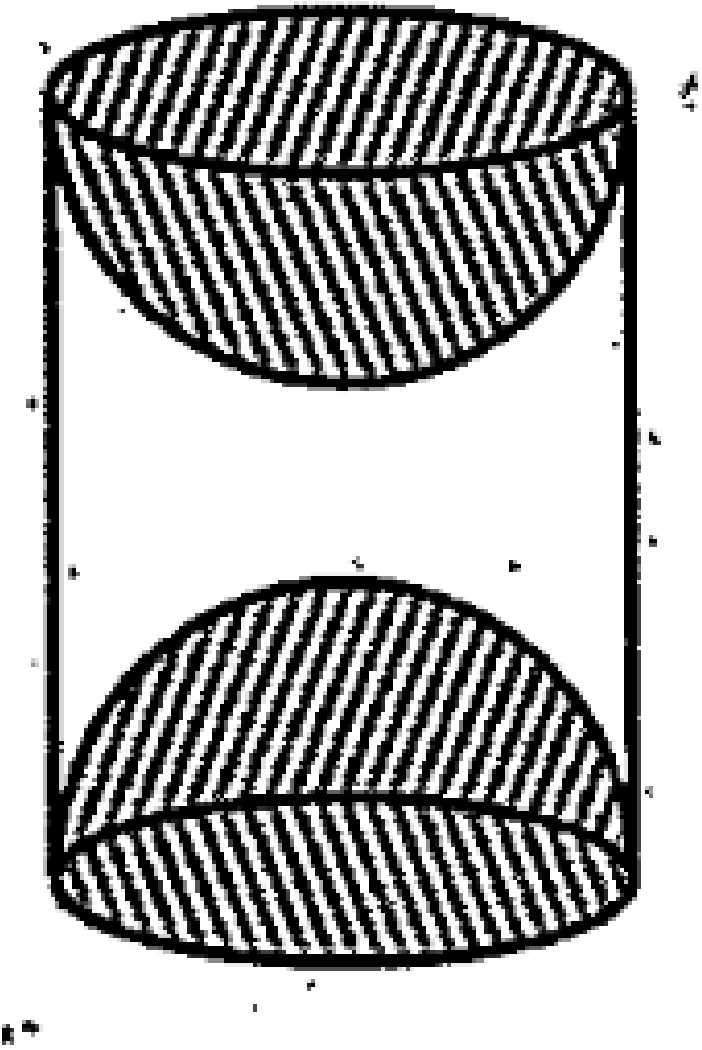
Watch Video Solution

8. 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 total surface area of the remaining solid to the nearest cm^2.

Watch Video Solution

9. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder,as shown in Fig.13.11.If the height of the cylinder is 10 cm,and its base is of radius

3.5. find the total surface area of the article.



Watch Video Solution

10. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1 cm and the height of the cone is equal to its radius.Find the volume of the solid tn terms of π.

Watch Video Solution

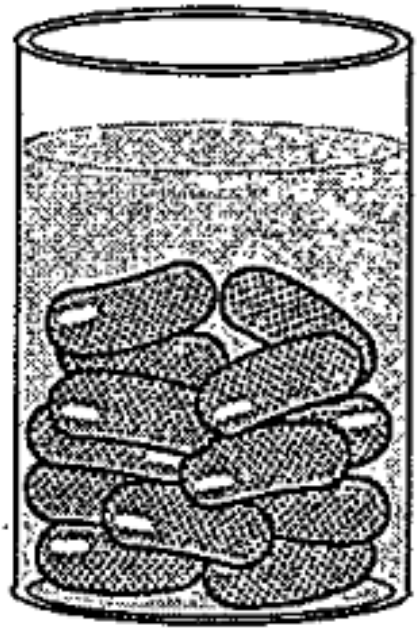
11. Rachel,an engineering student,was asked to make a model shaped like a cyclinder with two cones attached at its two ends by using a thin

aluminium sheet.The diameter of the model is 3 cm and its length is 12cm.If each cone has a height of 2 cm,find the volume of air contained in the model that Rachel made.(Assume the outer and inner dimensions of the model to be nearly the same).

Watch Video Solution

12. A gulab jamun contains sugar syrup up to about 30% of volume,Find approximately how much syrup would be found in 45 gulab

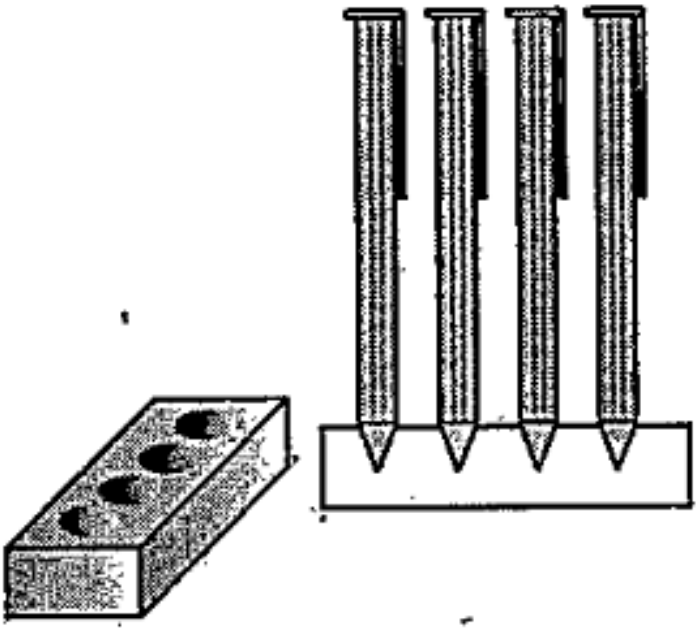
jamuns,each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 (see Fig.13.15)



Watch Video Solution

13. A pen stand made of wood is in the shape of a cuboid with four concial depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm. Find the volume of wood in the entire

stand (see Fig. 13.16).



Watch Video Solution

14. A vessel is in the form of an inverted cone.Its height is 8 cm and the radius of its

top,which is open,is 5 cm.It is filled with water up to the brim.When lead shots,each of which is a sphere of radius 0.5 cm are dropped into the vessel,one-fourth of the water floes out.Find the number of lead shots dropped in the vessel.

Watch Video Solution

15. A solid iron pole consists of a cylinder of height 220cm and base diameter 24 cm,which is surmounted by another cylinder of height

60cm and radius 8 cm.Find the mass of the pole,given that $1cm^3$ of iron has approximately 8g mass.(use $\pi = 3.14$).

Watch Video Solution

16. A solid consisting of a right circular cone of height 120cm and radius 60cm standing on a hemisphere of radius 60cm is placed upright in a right circular cylinder full of water such that it touches the bottom.Find the volume of

water left in the cylinder if the radius of the cylinder is 60cm and its height is 180cm.

Watch Video Solution

17. A spherical glass vessel has a cylindrical neck 8 cm long,2 cm in diameter,the diameter of the spherical part is 8.5cm.By measuring the amount of water it holds,a child finds its volume to be $345cm^3$.Check whether she is correct,taking the above as the inside measurements,and $\pi = 3.14$.

Watch Video Solution

18. A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6 cm.Find the height of the cylinder.

Watch Video Solution

19. Metallic sphere of radii 6 cm,8 cm and 10 cm respectively are melted to from a single solid sphere,Find the radius of the resulting sphere.

Watch Video Solution

20. A 20m deep well with diameter 7m is dug and the earth from digging is evenly spread out to from a platform 22m by 14m.Find the height of the platform.

Watch Video Solution

21. A well of diameter 3 m is dug 14 m deep.The earth take out of its has been spread evenly all

around it in the shape of a circular ring of width 4 m to form an embankment.Find the height of the embankment.

 Watch Video Solution

22. A container shaped like a right circular cylinder having diameter 12 cm and height 15 cm is full of ice cream.The ice cream is to be filled into cones of height 12 cm and diameter 6 cm,having a hemispherical shape on the

top.Find the number of such cones which can be filled with ice cream.

Watch Video Solution

23. How many silver coins 1.75 cm in diameter and of thickness 2mm,must be melted to form a cuboid of diamensions $5.5cm \times 10cm \times 3.5cm$?

Watch Video Solution

24. A cylinder bucket,32 cm high and with radius of base 18 cm,is filled with sand.This bucket is emptied on the ground and a conical heap of sand is formed.If the height of the conical heap is 24 cm,find the radius and slant height of the heap.

Watch Video Solution

25. Water in a canal,6 m wide and 1.5 m deep,is flowing with a speed of 10km/h.How much area

will it irrigate in 30minutes,if 8cm of standing water is needed?

Watch Video Solution

26. A farmer connects a pipe of internal diameter 20cm from a canal into a cylindrical tank in her field,which is 10 m in diameter and 2 m deep.If water flows through thr pipe at the rate of 3 km/h,in how much time will the tank be filled?

Watch Video Solution

27. A drinking glass is in the shape of a frustum of a cone height 14 cm.The diameters of its two circular ends 4 cm and 2 cm.Find the capacity of the glass.

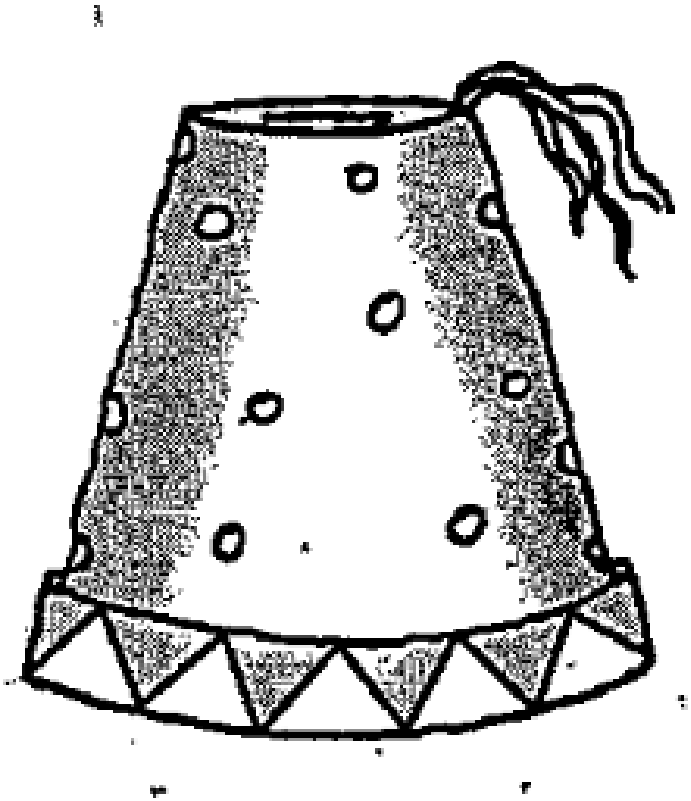
Watch Video Solution

28. The slant height of a frustum of a cone 4 cm and the perimeters(circumferences) of its circular ends are 18 cm and 6 cm.Find the curved surface area of the frustum.

Watch Video Solution

29. A fez,the cap used by the Turks,is shaped like the frustum of a cone (seeFig)If its radius on the open side is 10 cm,radius at the upper base is 4 cm and its slant height is 15 cm,find

the area of material used for making it.



Watch Video Solution

30. 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 and mass of the wire, assuming the density of copper to be $8.88 \frac{g}{cm^3}$.

Watch Video Solution

31. A right triangle whose sides are 3 cm and 4 am (other than hypotenuse) is made to revole about its hypotenuse.Find the volume and

surface of the double cone so formed.(choose value of π as found appropriate).

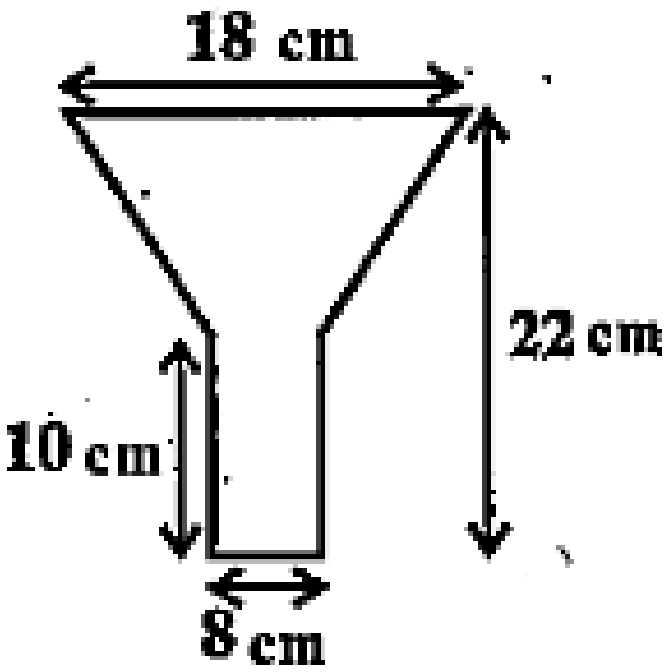
Watch Video Solution

32. In one fortnight of a given month,there was a rainfall of 10 cm in a river valley.If the area of the vally is $7280km^2$,show that the total rainfall was approximately equivalent to the addition to the normal water of three rivers each 1072 km long.75m wide and 3m deep.

Watch Video Solution

33. An oil funnel made of tin sheet consists of a 10cm long cylindrical portion attached to a frustum of a cone.If the total height is 22cm,diameter of the cylindrical portion is 8 cm and the diameter of the top of the funnel is 18 cm,find thev area of the tin sheet

required to made the funnel(seeFig.13.25).



Watch Video Solution

34. The surface area of a sphere is $616cm^2$ .Find its radius.

Watch Video Solution

35. A cylinder,a cone and a hemisphere are of equal base and have the same height.What is the ratio of their volumes?

Watch Video Solution

36. A cylinder and a cone are of the same base radius and of some height.Find the ratio of the volume of the cylinder to that of the cone.

Watch Video Solution

37. A sphere and a cube have equal surface areas.What is the ratio of the volume of the sphere to that of that cube?

Watch Video Solution

38. The radii of two cones are in the ratio 2:1 and their volumes are equal.What is the ratio of their heights?

Watch Video Solution

39. The radii of the bases of a cylinder and a cone are in the ratio 3:4 and their heights are in the ratio 2:3.What is the ratio of their volumes?

Watch Video Solution

40. Two cones height are in the ratio 1:3 and radii 3:1.What is the ratio volumes?

Watch Video Solution

41. Two cubes have their volumes in the ratio 1:27.What is the ratio of their surface areas?

 Watch Video Solution

42. A sphere of maximum volume is cut out from a solid hemisphere of radius r.What is the ratio of the volume of the hemisphere to that of cut out sphere?

 Watch Video Solution

43. What is the ratio of the volume of a cube to that of a sphere which will fit inside it?

Watch Video Solution

44. If the slant height of the frustum of a cone is 5 cm.If the difference between the radii of its two circular ends is 4 cm then find the height of the frustum.

Watch Video Solution

45. The slant height of the frustrum of a cone is 5cm.If the difference between the radii of its two circular ends is 4 cm then find the height of the frustum.

Watch Video Solution

46. A cylindrical pencil sharpened at one edge is the combination of

A. Two cylinders

B. a hemisphere and a cylinder

C. a cone and a cylinder

D. a cylinder and a frustum of a cone.

Answer:

Watch Video Solution

47. A funnel is the combination of

A. a cone and a hemisphere

B. a cylinder and a cone

C. a cylinder and a hemishere

D. a cylinder and frustum of a cone.

Answer:

Watch Video Solution

48. A plumbine is the combination of

A. a cylinder and a cone

B. a cylinder and a sphere

C. a hemisphere and a cone

D. a cylinder and a frustum of a cone.

Answer:

Watch Video Solution

49. A cone is cut by a plane parallel to its base and the upper part is removed.The part that is left over is called

A. a cone and a hemisphere

B. a sphere

C. a cylinder and a hemishere

D. frustum of a cone

Answer:

Watch Video Solution

50. During conversion of a solid from one shape to another,the volume of the new shape will

A. Decrease

B. Increase

C. Remain unaltered

D. be doubled

Answer:

Watch Video Solution

51. The diameter of a sphere is 6 cm.It is melted and drawn into a wire of diameter 2 mm.The length of the wire is__

A. 18m

B. 36m

C. 24 m

D. 76 m

Answer:

Watch Video Solution

52. The volume of a cube is $2744cm^3$.Its surface area is

a)$1176cm^2$ b) $616cm^2$ c)$784cm^2$ d)$216cm^2$

A. $1176cm^2$

B. $616cm^2$

C. 784cm^2`

D. 216^2

Answer:

Watch Video Solution

53. The length of the diagonal of a cube $6\sqrt{3}$ cm.Its total surface area is__

A. $193cm^2$

B. 216^cm^2

C. $361cm^2$

D. $486cm^2$

Answer:

Watch Video Solution

54. If edge of a cube is increased by 50% the percentage increase in the surface area is_

A. 0.25

B. 0.5

C. 1

D. 1.25

Answer:

Watch Video Solution

55. A metallic sphere of radius 10.5cm is melted and then recast into small cones each of radius 3.5cm and height 3cm.The number of such cone is__-

A. 126

B. 63

C. 192

D. 21

Answer:

Watch Video Solution

56. A sphere of radius 6cm is dropped into a cylindrical vessel partly filled with water.The radius of the vessel is 8 cm.If the sphere is submerged completely then the surface of the water rises by__

A. 3cm

B. 4.5cm

C. 1cm

D. 2.5cm

Answer:

 Watch Video Solution

57. The curve surface area of a right circular cone of height 15cm and base diameter 16 cm is_-

A. $36\pi cm^2$

B. $136\pi cm^2$

C. $236\pi cm^2$

D. $486\pi cm^2$

Answer:

Watch Video Solution

58. In a shower,5 cm rain falls.The volume of the water that falls on 2 hectares of ground is

__-

A. $100m^3$

B. $1000m^3$

C. $10000m^3$

D. $500m^3$

Answer:

Watch Video Solution

59. The ratio of the total surface area to the lateral surface area of cylinder with base radius 80cm and height 20cm is __

A. $5:1$

B. $1:3$

C. $4:1$

D. $2:1$

Answer:

Watch Video Solution

60. On increasing each of the radius of the base and the height of a cone by 20% its volume will be increasing by__

A. 0.1

B. 0.4

C. 0.72

D. 0.72

Answer:

Watch Video Solution

61. If three metallic spheres of radii 6cm,8cm and 10cm are melted to form a single sphere then the diameter of the sphere is

A. 16cm

B. 24cm

C. 20cm

D. 36cm

Answer:

 Watch Video Solution

62. A right triangle with sides 3cm,4cm and 5cm is rotated about the side of 3cm to form acone.The volume of the cone so formed is___

A. $12\pi cm^3$

B. $16\pi cm^3$

C. $24\pi cm^3$

D. $36\pi cm^3$

Answer:

Watch Video Solution

63. The volume of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is

A. $\frac{5}{3}\pi$

B. $\frac{4}{3}\pi$

C. π

D. $\frac{10}{3}\pi$

Answer:

Watch Video Solution

64. The maximum volume of a cone that can be carved out of a solid hemisphere of radius r is

A. $\frac{\pi r^3}{3}$

B. $\frac{2\pi r^3}{3}$

C. $\frac{\pi r^3}{6}$

D. $3\pi r^3$

Answer:

Watch Video Solution

65. The diameter of the ends of a frustum of a cone are 32 cm and 20cm.If its slant height is 10cm,then its lateral surface area is ___

A. $260\pi cm^2$

B. $200\pi cm^2$

C. $360\pi cm^2$

D. $160\pi cm^2$

Answer:

Watch Video Solution

66. The circular ends of a bucket are of radii 35cm and 14 cm and the height of the bucket is 40cm.Its volume is ___

A. $40080cm^3$

B. $801040cm^3$

C. $80080cm^3$

D. $80000cm^3$

Answer:

Watch Video Solution

67. The height and radius of the cone of which the frustum is a part are h_1 and r_1 respectively.If h_2 and $r_2$are the heights and

radius of the smaller base of the frustum respectively and $h_2 : h_1 = 1 : 2$then the value of $r_2 : r_1$is

A. $1 : 2$

B. $2 : 1$

C. $3 : 1$

D. $4 : 1$

Answer:

Watch Video Solution

68. If the radius of the base of a right circular cylinder is halved,keeping the height same then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is ___

A. $4:1$

B. $1:4$

C. $1:3$

D. $5:1$

Answer:

Watch Video Solution

69. A soild frustum is of height 8 cm.If the lower and upper ends are 3cm and 9cm respectively then its slant height is

A. 5cm

B. 10cm

C. 17cm

D. 25cm

Answer:

Watch Video Solution