



# MATHS

## BOOKS - MODERN PUBLICATION

### SURFACE AREAS AND VOLUMES

#### Example

1. Find the surface area of cuboid whose length, breadth and height are 20 cm, 10 cm and 8 cm respectively.



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2. Find the surface area of a cube whose edge is 12 cm.



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3. The dimensions of a cuboid are in the ratio of 1:2:3 and its total surface area is  $198m^2$ . Find the dimensions.



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4. A cuboidal has total surface area of  $90\text{cm}^2$  and its lateral surface area is  $36\text{m}^2$ . Find the area of the base.



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5. Three cubes, each of 5 cm, are joined end to end. Find the surface area of the resulting cuboid.



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6. A magician wants to take his stick measuring 28 cm in his luggage box. The dimensions of his luggage box are  $26\text{cm} \times 15\text{cm} \times 3\text{cm}$ . Can he put his stick in the box?



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7. The sum of the length breadth and height of the cuboid is 16 cm and the length of its

diagonal is 12 cm. find the total surface area of the cuboid.



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**8.** The cost of papering four walls of a room at Rs 1.40 is Rs 315. The height of the room is 5 metres. Find the length and breadth of the room if they are in the ratio 4:1.



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**9.** Find the cost of colour washing the four walls of a room whose length is 8 m, breadth is 7 m and height is 6 m at the rate of Rs 30 per square metre.



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**10.** A wooden box 1.5 m long, 1.25 m wide and 65 cm deep and open at the top is to be made. Find the cost of wood required for it, if Rs 30 is the cost of 1 metre square of wood.





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**11.** The cost of papering four walls of a room at Rs 1.40 is Rs 315. The height of the room is 5 metres. Find the length and breadth of the room if they are in the ratio 4:1.



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**12.** A class room is 7 m long, 6.5 m wide and 4 m high. It has one door  $3m \times 1.4m$  and three windows  $2m \times 1m$ . The interior walls are to

be white washed. The contractor charges Rs 10.50 per square metre. Find the total cost of white washing.



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13. Length of a room is  $1\frac{1}{3}$  times its breadth and its height is  $\frac{1}{2}$  times its length. The cost of white washing the walls at the rate of  $Rs2.60perm^2$  is Rs 291.20. find the cost of tiling the floor at the rate of  $Rs8perm^2$ .



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**14.** Find the volume of a cuboid whose  
intensions are:

length=15m,breadth=12m and height=4.5m.



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**15.** Find the volume of a cube, each of whose  
edge measures 10cm.



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**16.** The total surface area of a cube is  $216m^2$ .

Find its volume.



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**17.** The lateral surface area of a cube is  $324cm^2$

. Find its volume.



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**18.** Find the how many cubes, each of edge 4 m, can be cut from a cuboid of dimensions

$$20m \times 16m \times 8m.$$



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**19.** The volume of a cuboid is  $1372cm^2$ . Its breadth is equal to its length and its height is 4 times its width. What are the dimensions of the cuboid.



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20. A granary is in the shape of a cuboid of size  $12m \times 6m \times 4m$ . A bag of grain occupies a space of  $0.75m^3$ . How many bags can be stored in the granary?



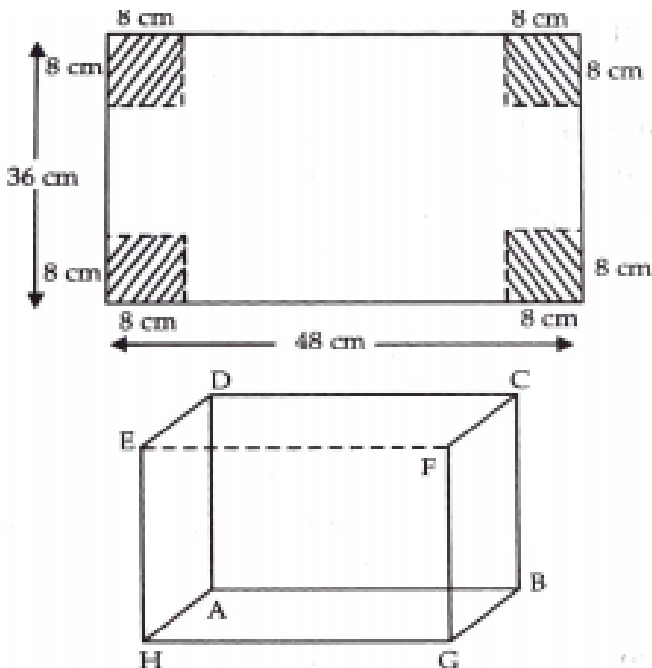
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21. The length of a cold storage is double its breadth. Its height 3 metres. The area of its four walls is  $108m^2$ . Find its volume.



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22. A metallic sheet is of rectangular shape with dimensions  $48\text{cm} \times 36\text{cm}$ . An open box is made by cutting off squares of side  $8\text{ cm}$  from each and folding up the flaps. Find the volume of the box.





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**23.** A box with lid is made of 2 cm thick wood. Its external length, breadth and height are 26 cm, 20cm and 15 cm, respectively. How many cubic cm of liquid can its store? Also, find the volume of wood used in it.



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**24.** Water flows in a tank  $200m \times 150m$  at the base, through a pipe whose cross section is 2

dm by 1.5 dm at the speed of 15 km per hour in what time, will the water be 3 metres deep?



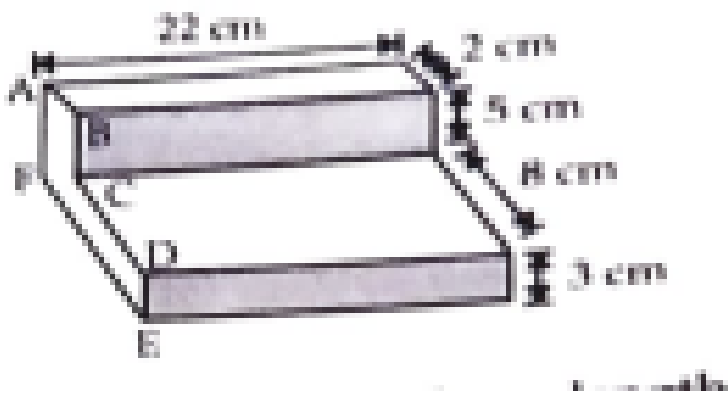
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**25.** A plot of land is 240 m long and 180 m broad. A trench 10 m wide is dug all around it and the earth dug out is spread over the plot, raising the level of the plot by 25 cm. Find the depth of the trench.



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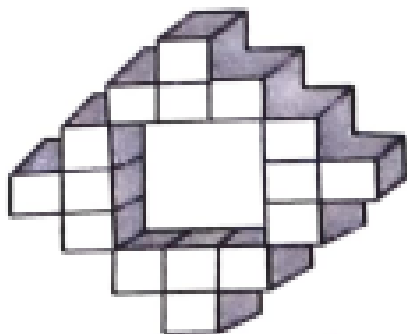
26. A solid wood piece is made up of two pieces joined at right angles. The face ABCDEFA is the uniform cross section. Assuming all the angles A,B,C,D,E and F to be right angles, find the volumes of the piece



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27. A child playing with building blocks, which are of the shape of cubes, has built a structure as shown in following figure. If edge of each cube is 5 cm, find the volume of structure.



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**28.** Find the area of curved surface of cylinder having radius of base 14 cm and height 25 cm.



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**29.** Find total surface area of a cylinder having radius of base 14 cm and height 25 cm.



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**30.** The ratio between the curved surface area and the total surface area of a right circular cylinder is 1:3, find the ratio between the length and radius of the cylinder.



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**31.** The radii of two right circular cylinder in the ratio 2 : 3 and their heights are in the ratio 5:4. Show that the ratio of their curved surfaces is 5: 6.





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**32.** An iron pipe 20 cm long has exterior equal to 25 cm. If 1 cm is thickness of the pipe. Find the whole surface area of the pipe.



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**33.** The diameter of a roller is 1.4 m and its is 0.7 m long. How much area will it cover in 4 revolutions?



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**34.** Find the cost of preparing a closed cylindrical tank of height 2.8 m and base diameter 4 m at the rate of Rs 100 per sq. m.



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**35.** The diameter of a roller, 140 cm long is 9 cm. if takes 400 complete revolutions to level a playground, find the cost of levelling at Rs 1 per square metre.



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**36.** Find the volume of a right circular cylinder whose radius is 14 cm and height is 10 cm.



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**37.** The area of the base of a cylinder is  $25\text{cm}^2$  with height is 15 cm. find the volume of the cylinder.



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**38.** The radius and height of the cylinder are ratio 4:7. Determine the radius of the cylinder with its volume is  $1188\text{cm}^3$ .



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**39.** The curved surface area and volume of a pillar are  $264\text{cm}^2$  and  $396\text{cm}^3$  respectively. Find the height and radius of the pillar.



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**40.** The circumference of the base of a cylindrical vessel is 110 cm and its height is 20 cm. how many litres of water can it hold?



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**41.** a circular drum having radius 4.2 m and height 3.5 m, how many bags of rice can be emptied when the space required for rice in each bag is 2.1 cubic m.



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**42.** A well with 12 m inside diameter is dug 14 m deep. Earth taken out of its spread all around to a width of 5 m to form of an embankment. Find the height of embankment.



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**43.** Find the weight of a lead pipe 3.5 m long. The external diameter of pipe is 2.4 cm and thickness of the pipe is 3 mm and 1 cm. of lead weights 10 g.





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**44.** A rectangular sheet of paper of dimensions  $30\text{cm} \times 16\text{cm}$  can be transformed into an open ended cylinder in two ways. Find the ratio of volumes of two cylinders thus formed.



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**45.** The radius of a cone is 7 cm and its slant height is 9 cm. find the

curved surface area.



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**46.** The radius of a cone is 7 cm and its slant height is 9 cm. find the total surface area of the cone.



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**47.** The height of a cone is 24 cm and the radius of the base is 7 cm. find the slant height

and the total surface area of the cone.



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**48.** The radius of the slant height of a cone are in the ratio of 4:7. if its curved surface area is  $792\text{cm}^2$ . Find its radius.



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**49.** The lateral surface area of a cylinder is equal to the curved surface area of the cone. If

the radius is same, then find the ratio of the height of the cylinder and slant height of the cone.



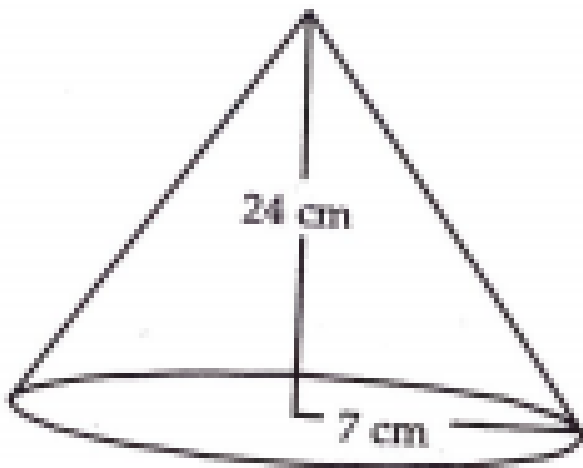
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**50.** How many metres of cloth 5 m wide will be required to make a conical tent, the radius of whose base is 7 m and whose height is 24 m?



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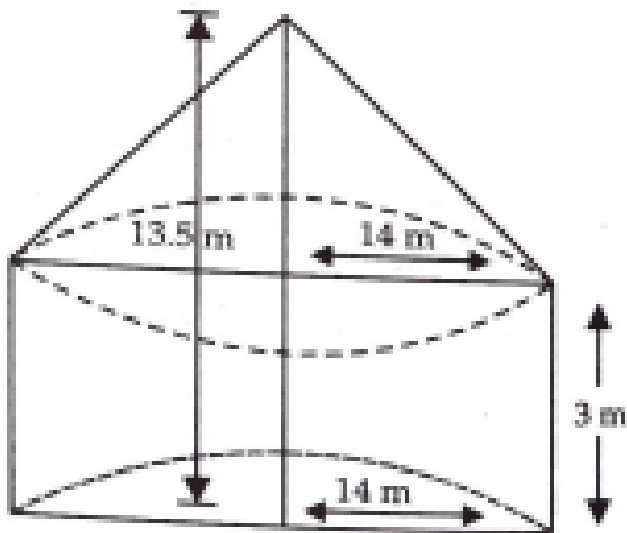
51. A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 100 such caps if  $1m^2$  of sheet used for making cap costs Rs 700.



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**52.** A tent is of the shape of a right circular cylinder upto height of 3 metres and then becomes a right circular cone with maximum height of 13.5 metres above the ground. Calculate the cost of painting the inner side of the tent at the rate of Rs.2 per square metre, if

the radius of the base is 14 metres.



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53. Find the volume of a right circular cone whose base radius is 21 cm and height 10.2 m



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54. The radius of a right circular cone is 4 cm and volume is  $48\pi\text{cm}^3$  find its height.



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55. The volume of a cone is  $18480\text{cm}^3$ . If the height of the cone is 40 cm, find its radius of the base.



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**56.** A conical tank is 4 m deep and its circular top has radius 1.75 m, find the capacity of the tank in kilolitres.



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**57.** A cone and a cylinder have the same base. Find the ratio of their heights if their volumes are equal.



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**58.** The base radii of two right circular cones of the same height are in the ratio 3:5. Find the ratio of their volumes.



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**59.** A solid cube of side 9 cm is melted to make a cone of height 5 cm, find the radius of the base of the cone.



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**60.** If  $h, C, V$  are respectively the height, the curved surface and volume of the cone, prove that:

$$3\pi Vh^3 - C^2h^2 + 9V^2 = 0$$



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**61.** A conical tent is to accommodate 11 persons. Such person should have 4 sq.m of space on the ground and 20 cubic metres of air to breathe? Find the height of the cone.





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**62.** find the volume of the largest circular cone that can be cut out of a cube whose edge is 10 cm.



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**63.** A cone of radius 4 cm is filled with water. If the water is poured in a cylinder of radius 8 cm, the height of the water rises 2 cm, find the height of the cone.



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**64.** A semicircular thin sheet of metal of diameter 30 cm is bent to form an open conical cup. Find the capacity of the cup.



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**65.** Find the surface area of a sphere of radius 14 cm.



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**66.** Find the curved surface area and total surface area of hemisphere of radius 14 cm.



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**67.** The surface area of a sphere is  $346.5\text{cm}^2$ .  
Find its radius.



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**68.** A sphere, a cylinder and a cone with are of the same radius and same height. Find the ratio of their curved surfaces.



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**69.** Prove that the surface area of the sphere is assume as that of the lateral surface of a right circular cylinder, which just encloses the sphere.



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**70.** A toy is in the shape of a right circular cylinder with a hemisphere on one end and a cone on other. The radius and height of the cylindrical part are 5cm and 13cm respectively. The radii of hemisphere and conical parts are the same as that of the cylindrical part. Find the surface area of the toy if the total height of the conical part is 12cm.



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71. The internal and external diameters of a hollow hemisphere vessel are 42 cm and 45.5 cm respectively. Find its capacity and also its outer curved surface area.



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72. Find the cost of fencing a square park of side 250 m at the rate of Rs.20 per metre.



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**73.** A wooden toy is in the form of a cone surmounted by a hemisphere. The diameter of the base of the cone is 6 cm. and its height is 4 cm. Find the cost of painting the toy at the rate of Rs. 50 per  $1000\text{cm}^2$ .



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**74.** Find the volume of a sphere of radius 1 cm.



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**75.** Find the volume of a sphere whose surface area is  $154\text{cm}^2$  .



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**76.** Find the surface area of a sphere whose volume is  $4851\text{cm}^3$  .



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**77.** Two numbers are in the ratio 3:4. If the difference of their cubes is 37 find the

numbers.



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**78.** Find the volume of a hemispherical of radius 3.5 cm.



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**79.** The circumference of the edge of a hemispherical bowl is 132 cm. find its capacity?



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**80.** A hemispherical bowl is made of steel 0.25 cm thick. The inner radius of the bowl is 5 cm. Find the volume of steel used in making the bowl. [ Take  $\pi = 3.14$ ]



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**81.** How many spherical bullets can be made form a solid cube of lead where edge measures 44 cm, having 2 cm in radius?



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**82.** A solid lead ball of radius 7 cm is melted is converted into a wire of diameter 0.2 cm. find its length of the wire.



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**83.** 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

total height of the vessel is 13 cm. Find the inner surface area of the vessel.



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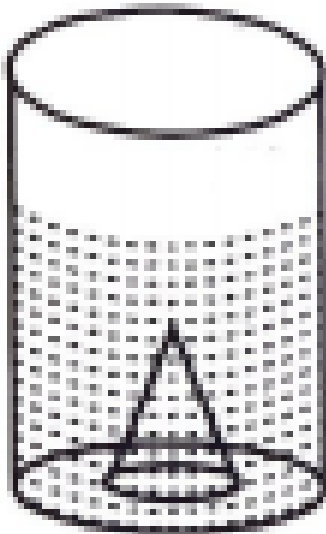
**84.** A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm, find the volume of the wooden toy.



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**85.** A right circular cone of diameter  $r$  cm and height 12 cm rests on the base of a right circular cylinder of radius  $r$  cm. Their bases are in the same plane and the cylinder is filled with water upto a height of 12 cm. If the cone is removed, find the height to which water level fall.





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**86.** A sphere of diameter 6cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of cylindrical vessel is 12cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel.



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**87.** A cylindrical container of radius 5 cm and height 10 cm 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 four times the radius of its base, find the radius of the ice-cream cone



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**88.** If diameter of a sphere is decreased by 25% then what percent does its curved surface area decrease ?



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**89.** A NCC camp for a week was organised for Class IX students. The accommodation was planned in hemispherical tents each of radius 2.8 cm. obtain the area of the canvas required for making the tent. Also, find the cost of tent

$Rs. 300perm^2$ . In what way camping is helpful for the development of the students?



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**90.** Kunal is curious to find out the relationship between the diameter of the moon and the earth. From the available data, it is known that the volume of earth is 64 times the volume of the moon. He concluded that the diameter of the moon is  $\frac{1}{4}$  of the

diameter of the earth.

Show did he arrive at the conclusions?



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**91.** Kunal is curious to find out the relationship between the diameter of the moon and the earth. From the available data, it is known that the volume of earth is 64 times the volume of the moon. He concluded that the diameter of the moon is  $\frac{1}{4}$  of the diameter of the earth.

Show did he arrive at the conclusions?



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**92.** A plastic box 1.5 m long, 1.25 m wide and 65 cm deep is to be made. Its is opened at the top. Ignoring the thickness of the plastic sheet: determine the area of the sheet required for making the box.



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**93.** A plastic box 1.5 m long, 1.25 m wide and 65 cm deep is to be made. It is opened at the top. Ignoring the thickness of the plastic sheet, determine: (i) The area of the sheet required for making the box. (ii) The cost of sheet for it, if a sheet measuring  $1m^2$  costs Rs 20.



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**94.** The length, breadth and height of a room are 5 m, 4 m and 3 m respectively. Find the



cost of white washing the walls of the room and the ceiling at the rate of 7.50 per  $m^2$  .



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**95.** The floor of a rectangular hall has a perimeter 250 m. If the cost of painting the four walls at the rate of Rs 10 per  $m^2$  is Rs 15000, find the height of the hall.



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**96.** The paint in a certain container is sufficient to paint an area equal to  $9.375m^2$  . How many bricks of dimensions 22.5 cm x 10 cm x 7.5 cm can be painted out of this container ?



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**97.** A cubical box has each edge 10 cm a cuboidal box is 10 cm wide, 12.5 cm long 8 cm high. Which box has the greater lateral surface area and by how much ?





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**98.** A cubical box has each edge 10 cm and a cuboidal box is 10 cm wide, 12.5 cm long 8 cm high. Which box has the smaller total surface area and by how much ?



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**99.** A small indoor greenhouse (herbarium) is made entirely of glass panes (including base) held together with tape. It is 30 cm long, 25

cm wide and 25 cm high. What is the surface area of the glass ?



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**100.** A small indoor greenhouse (herbarium) is made entirely of glass panes (including base) held together with tape. It is 30 cm long, 25 cm wide and 25 cm high. How much of tape is needed for all the 12 edges ?



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**101.** Shanti Sweets Stall was placing an order for making cardboard boxes for packing their sweets. Two sizes of boxes were required. The bigger of dimensions 25 cm by 20 cm by 5 cm and the smaller of dimensions 15 cm by 12 cm by 5 cm. 5% of the total surface area is required extra, for all the overlaps. If the cost of the cardboard is Rs 4 for  $1000 \text{ cm}^2$ , find the cost of cardboard required for supplying 250 boxes of each kind.



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**102.** Parveen wanted to make a temporary shelter for her car, by making a box-like structure with tarpaulin that covers all the four sides and the top of the car (with the front face as a flap which can be rolled up). Assuming that the stitching margins are very small, and therefore negligible, how much tarpaulin would be required to make the shelter of height 2.5 m. with base dimensions 4 m x 3 m ?



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**103.** The curved surface area of a right circular cylinder of height 14 cm is  $88\text{cm}^2$ . Find the diameter of the base of the cylinder.



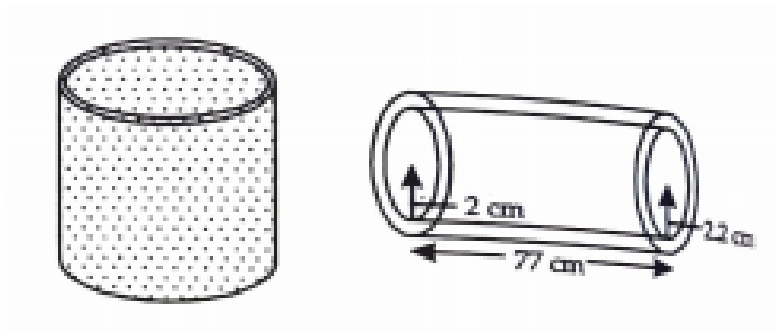
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**104.** It is required to make a closed cylindrical tank of height 1 m and base diameter 140 cm from a metal sheet. How many square metres of the sheet are required for the same?



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**105.** A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter beight 4.4 cm.



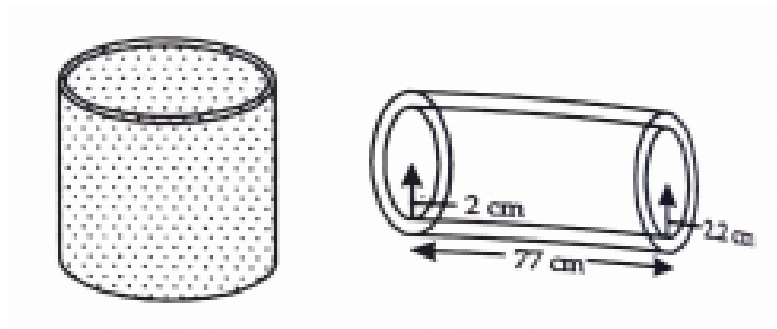
Inner curved surface area?



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**106.** A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter being 4.4 cm.

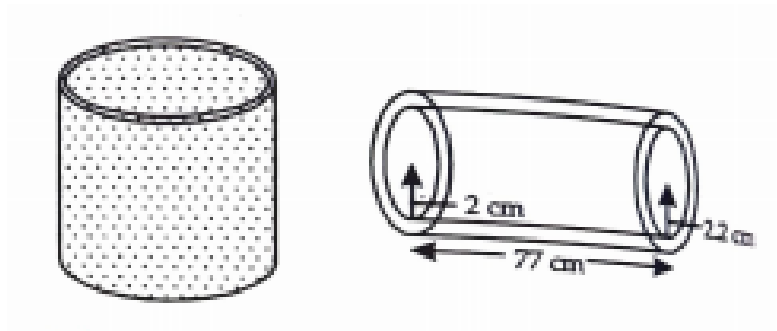


Find outer curved surface area.



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**107.** A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter being 4.4 cm.



Find total surface area.



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**108.** The diameter of a roller is 84 cm and its length is 120 cm. It takes 500 complete revolutions to move once over to level a playground. Find the area of the playground in  $m^2$ .



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**109.** Curved surface area of a right circular cylinder is  $4.4 m^2$ . If the radius of the base of the cylinder is 0.7 m, find its height.





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**110.** The inner diameter of a circular well is 3.5 m. It is 10 m deep. Find its inner curved surface area.



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**111.** The inner diameter of a circular well is 3.5 m. It is 10 m deep. Find the cost of plastering this curved surface at the rate of Rs 40 per  $m^2$ .

.



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**112.** A cylindrical pillar is 50 cm in diameter and 3.5 m in height. Find the cost of painting the curved surface of the pillar at the rate of ₹ 12.50 per  $m^2$ . Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**113.** In a hot water heating system, there is a cylindrical pipe of length 28 m and diameter 5 cm. Find the total radiating surface in the system. Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**114.** Find:- the lateral or curved surface area of a closed cylindrical petrol storage tank that is

4.2 m in diameter and 4.5 m high. Assume

$\pi = \frac{22}{7}$ , unless stated otherwise.



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**115.** Find:- how much steel was actually used, if

$\frac{1}{12}$  of the steel actually used was wasted in

making the tank. Assume  $\pi = \frac{22}{7}$ , unless

stated otherwise.



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**116.** In Fig., you see the frame of a lampshade. It is to be covered with a decorative cloth. The frame has a base diameter of 20 cm and height of 30 cm. A margin of 2.5 cm is to be given for folding it over the top and bottom of the frame. Find how much cloth is required for covering the lampshade. Assume  $\pi = \frac{22}{7}$



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**117.** The students of a Vidyalaya were asked to participate in a competition for making and decorating penholders in the shape of a cylinder with a base, using cardboard. Each penholder was to be of radius 3 cm and height 10.5 cm. The Vidyalaya was to supply the competitors with cardboard. If there were 35 competitors, how much cardboard was required to be bought for the competition?

Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**118.** Diameter of the base of a cone is 10.5 cm and its slant height is 10 cm. Find its curved surface area. Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**119.** Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m. Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.





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**120.** Curved surface area of a cone is  $308\text{cm}^2$  ,  
and its slant height is 14 cm. Find radius of the  
base .



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**121.** Curved surface area of a conic is  $305\text{cm}^2$   
and its slant height is 2.4 cm. find  
total surface area of the cone.



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**122.** A conical tent is 12 m high and the radius of its base is 5 m. find:  
slant height of the tent.



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**123.** A conical tent is 10 m high and the radius of its base is 24 m. Find cost of the canvas required to make the tent, if the cost of  $1m^2$  canvas is Rs 70.



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**124.** What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6m? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm (use  $\pi = 3.14$ ).



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**125.** The slant height and base diameter of a conical tomb are 25 m and 14 m, respectively. Find the cost of whitewashing its curved surface at the rate of Rs 210 per  $100m^2$ .



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**126.** A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to

make 10 such caps. Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**127.** A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled cardboard. Each cone has a base diameter of 40 cm and height 1 m. If the outer side of each of the cones is to be painted and the cost of painting is Rs 12 per  $m^2$ , what will be the cost of painting all these

cones (use  $\pi = 3.14$ , and take  $\sqrt{1.04} = 1.02$ )

?



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**128.** Find the surface area of a sphere of radius 35 cm?



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**129.** Find the surface area of a sphere of radius: 5.6 cm





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**130.** Find the surface area of a sphere of radius 14 cm.



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**131.** Find the surface area of a sphere of diameter 14 cm?



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**132.** Find the surface area of a sphere whose diameter is 21 dm.



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**133.** Find the surface area of a sphere of diameter: 3.5m



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**134.** Find the total surface area of a hemisphere of radius 10 cm . (Use  $\pi = 3.14$ )



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**135.** The radius of a spherical balloon increases from 7 cm to 14 cm as air is being pumped into it. Find the ratio of surface areas of the balloon in the two cases.



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**136.** A hemispherical bowl made of brass has inner diameter 105 cm. Find the cost of tin-plating it on the inside at the rate of Rs 16 per  $100\text{cm}^2$ .



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**137.** Find the radius of a sphere whose surface area is  $154\text{cm}^2$ .



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**138.** The diameter of the moon is approximately one fourth the diameter of the earth. Find the ratio of their surface area.



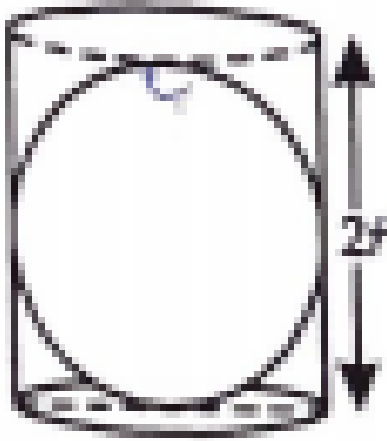
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**139.** A hemispherical bowl is made of steel, 0.25 cm thick. The inner radius of the bowl is 5 cm. Find the outer curved surface area of the bowl.



**Watch Video Solution**

**140.** A right circular cylinder just encloses a sphere of radius  $r$

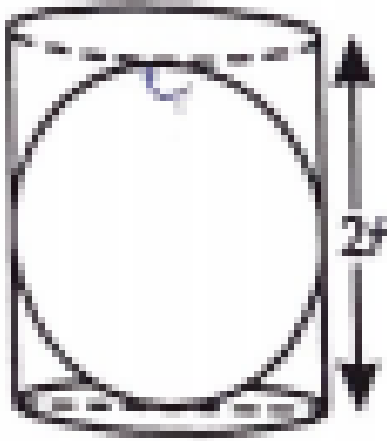


Curved surface area of the cylinder.



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141. A right circular cylinder just encloses a sphere of radius  $r$

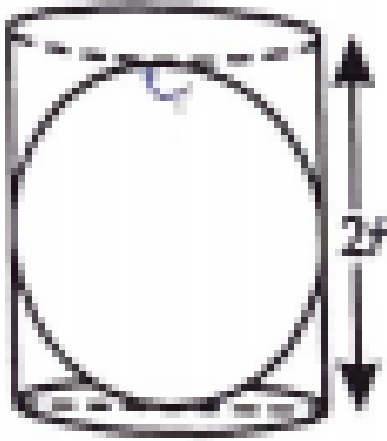


curved surface area of the cylinder.



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142. A right circular cylinder just encloses a sphere of radius  $r$



ratio of the areas of sphere to curved surface area of cylinder.



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**143.** A matchbox 4 cm x 2.5 cm x 1.5 cm. What will be the volume a packet containing 12 such boxes ?



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**144.** A cuboidal water tank is 6 m long, 5 m wide and 4.5 m deep. How many litres of water can it hold ? ( $1 m^3 = 1000 l$ ).



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**145.** A cuboidal vessel is 10 m long and 8 m wide. How high must it be made to hold  $380m^3$  of liquid ?



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**146.** Find the cost of digging a cuboidal pit 8 m long, 6 m broad and 3 m deep at the rate of Rs 30 per  $m^3$ .



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**147.** The capacity of a cuboidal tank is 50000 litres of water. Find the breadth of the tank, if its length and depth are respectively 2.5 m and 10 m. ( $1000l = 1m^3$ )



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**148.** A village, having a population of 4000, requires 150 litres of water per head per day. It has a tank measuring 20 m by 15 m by 6 m. For how many days will the water of this tank last ?



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**149.** A godown measures  $40m \times 25m \times 15m$ .

Find the maximum number of wooden crates each measuring  $1.5m \times 1.25m \times 0.5m$  that can be stored in the godown.



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**150.** A solid cube of side 12 cm is cut into eight cubes of equal volume. What will be the side

of the new cube ? Also, find the ratio between their surface areas.



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**151.** A river 3 m deep and 40 m wide is flowing at the rate of 2 km per hour. How much water will fall into the sea in a minute?



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**152.** The circumference of the base of a cylindrical vessel is 132 cm and its height is 25 cm. How many litres of water can it hold ?

$$(1000\text{cm}^3 = 11)$$



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**153.** The inner diameter of a cylindrical wooden pipe is 24 cm and its out diameter is 28 cm. The length of the pipe is 35 cm. Find the mass

of the pipe, if  $1 \text{ cm}^3$  of wood has a mass of 0.6 g.



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**154.** A soft drink is available in two packs – (i) a tin can with a rectangular base of length 5 cm and width 4 cm, having a height of 15 cm and (ii) a plastic cylinder with circular base of diameter 7 cm and height 10 cm. Which container has greater capacity and by how

much? Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**155.** If the lateral surface of a cylinder is  $94.2 \text{ cm}^2$  and its height is 5 cm, then find radius of its base. (Use  $\pi = 3.14$ )



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**156.** If the lateral surface of a cylinder is  $94.2 \text{ cm}^2$  and its height is 5 cm, then find volume of the cylinder. ( Use  $\pi = 3.14$ )



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**157.** It costs Rs 2200 to paint the inner curved surface of a cylindrical vessel 10 m deep. If the cost of painting is at the rate of Rs 20 per  $m^2$ , find inner curved surface area of the vessel.



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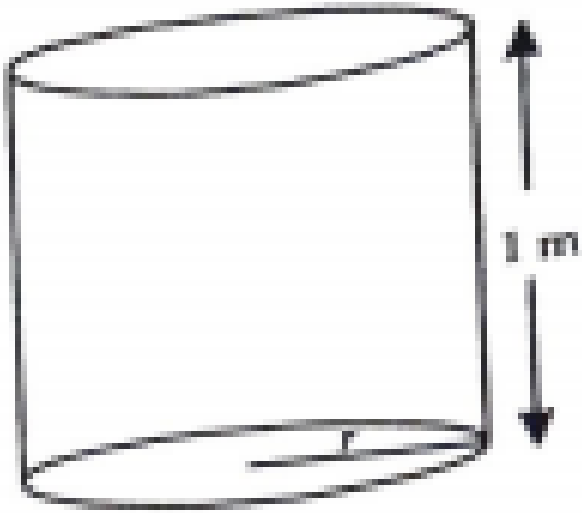
**158.** It costs Rs 2200 to paint the inner curved surface of a cylindrical vessel 10 m deep. If the cost of painting is at the rate of Rs 20 per  $m^2$ , find capacity of the vessel.



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**159.** The capacity of a closed cylindrical vessel of height 1 m is 15.4 litres. How many square metres of metal sheet would be needed to

make it



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**160.** A lead pencil consists of a cylinder of wood with a solid cylinder of graphite filled in the interior. The diameter of the pencil is 7

mm and diameter of graphite is 1 mm. If the length of the pencil is 14 cm, find the volumes of the wood and that of the graphite.



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**161.** A patient in a hospital is given soup daily in a cylindrical bowl of diameter 7 cm. If the bowl is filled with soup to a height of 4 cm, how much soup the hospital has to prepare daily to serve 250 patients ?



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**162.** Find the volume of the right circular cone with radius 6 cm, height 7 cm .



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**163.** Find the volume of the right circular cone with radius 3.5 cm, height 12 cm .



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**164.** Find the capacity of a conical vessel with radius 7 cm, slant height 25 cm.



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**165.** Find the capacity of a conical vessel with height 12 cm, slant height 13 cm.



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**166.** The height of a cone is 15 cm. If its volume is  $1570\text{cm}^3$ , find the radius of the base. (Use  $\pi = 3.14$ )



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**167.** If the volume of a right circular cone of height 9 cm is  $48\pi\text{cm}^3$ , find the diameter of its base.



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**168.** A conical pit of top diameter 3.5m is 12 m deep. Its capacity in kilo litres is :



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**169.** The volume of a right circular cone is  $9856 \text{ cm}^3$ . If the diameter of the base is 28 cm, find height of the cone. Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**170.** The volume of a right circular cone is  $9856 \text{ cm}^3$ . If the diameter of the base is 28 cm, find slant height of the cone. Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**171.** The volume of a right circular cone is  $9856 \text{ cm}^3$ . If the diameter of the base is 28 cm, find curved surface area of the cone. Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**172.** A right triangle ABC with sides 5 cm, 12 cm and 13 cm is revolved about the side 12 cm. Find the volume of the solid so obtained.

Assume  $\pi = \frac{22}{7}$ , unless stated otherwise.



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**173.** If the triangle ABC in the Question above is revolved about the side 5 cm, then find the volume of the solid so obtained. Find also the ratio of the volumes of the two solids

obtained in above and this Questions. Assume

$$\pi = \frac{22}{7}, \text{ unless stated otherwise.}$$



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**174.** A heap of wheat is in the form of a cone whose diameter is 10.5 m and height is 3 m. Find its volume. The heap is to be covered by canvas to protect it from rain. Find the area of the canvas required.



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**175.** Find the volume of a sphere whose radius is 7 cm.



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**176.** Find the volume of a sphere whose radius is 0.63 cm.



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**177.** Find the amount of water displaced by a solid spherical ball of diameter 28 m.



**Watch Video Solution**

**178.** Find the amount of water displaced by a solid spherical ball of diameter 0.21 m.



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**179.** The diameter of a metallic ball is 42 cm. What is the mass of the ball, if the metal weighs 8.9 g per  $cm^3$  ?



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**180.** The diameter of moon is approx, one fourth of the diameter of the earth. What fraction of volume of the earth is the volume of the moon ?



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**181.** How many litres of milk can a hemispherical bowl of diameter 10.5 cm hold?



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**182.** A hemispherical tank is made up of an iron sheet 1 cm thick. If the inner radius is 1 m, then find the volume of the iron used to make the tank.



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**183.** Find the volume of a sphere whose surface area is  $154\text{cm}^2$ .



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**184.** A dome of a building is in the form of a hemisphere. From inside, it was white washed at the cost of Rs 498.96. If the cost of white-washing is at the rate of Rs 2.00 per square metre, find the inner surface area of the dome.







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**185.** A dome of a building is in the form of a hemisphere. From inside, it was white washed at the cost of Rs 498.96. If the cost of white-washing is at the rate of Rs 2.00 per square metre, find the volume of the air inside the dome.



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**186.** Twenty seven solid iron spheres, each of radius  $r$  and surface area  $S$  are melted to form a sphere with surface area  $S'$ . Find the radius  $r'$  area of the new sphere.



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**187.** Twenty seven solid iron spheres, each of radius  $r$  and surface area  $S$  are melted to form a sphere with surface area  $S'$ . Find the ratio of  $S$  and  $S'$ .





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**188.** A capsule of medicine is in the shape of a sphere of diameter 3.5 mm. How much medicine (in  $mm^3$ ) is needed to fill this capsule ?

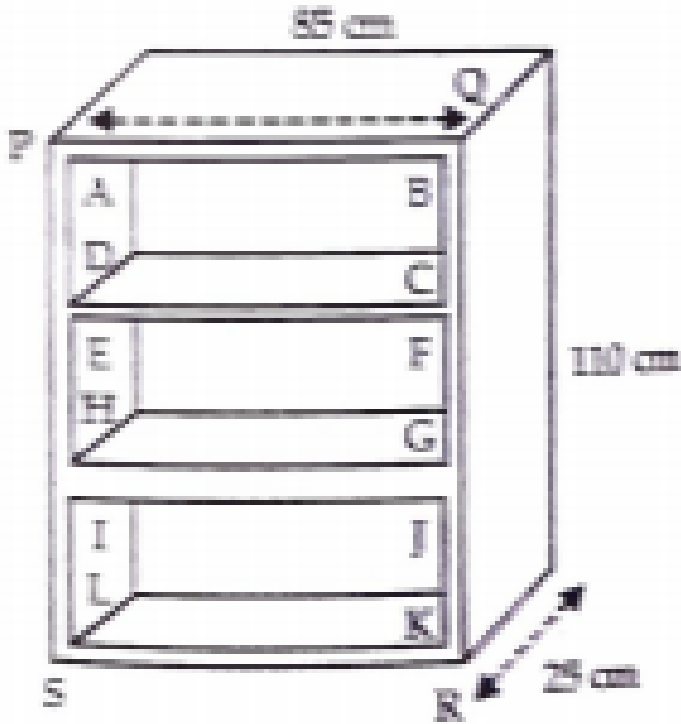


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**189.** A wooden bookshelf has external dimensions as follows: Height =110 cm, Depth = 25 cm, Breadth = 85 cm. The thickness of the

plank is 5 cm everywhere. The external faces are to be polished and the inner faces are to be painted. If the rate of polishing is  $20 \text{paise per cm}^2$  and the rate of painting is  $10 \text{paise per cm}^2$ . Find the total expenses required for polishing and painting the

surface of the bookshelf.



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**190.** If diameter of a sphere is decreased by 25% then what percent does its curved surface

area decrease ?



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**191.** 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 the sphere.



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**192.** If the radius of a right circular cone is halved and height is doubled, the volume remains unchanged.



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**193.** In a right circular cone, height, radius and slant height do not always be the sides of a right triangle?



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**194.** The volume of largest side right circular cone that can be fitted in a cube whose edge is  $2r$  equals to the volume of a hemisphere of radius  $r$ .



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**195.** A cylinder and a right circular cone of hemisphere having the same base and same height. The volume of the cylinder is 3times the volume of the cone.



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**196.** State whether True or False.

If radius of cylinder is doubled and height is halved then the new volume becomes 2 times.



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**197.** A cylinder and a right circular cone of hemisphere having the same base and same height. The volume of the cylinder is 3times the volume of the cone.



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**198.** 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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**199.** If a sphere is inscribed in a cube then the ratio of the volume of the cube to the volume of sphere will be  $6 : \pi$



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**200.** If the length of the diagonal of a cube is  $6\sqrt{3}$  cm, then the length of the edge of the cube is 3 cm.



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**201.** State whether True or False.

If radius of cylinder is doubled and height is halved then the new volume becomes 2 times.



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**202.** Metal spheres, each of radius 2 cm, are packed into a rectangular box of internal dimensions  $16\text{cm} \times 8\text{cm} \times 8\text{cm}$ . When 16 spheres are packed the box is filled with preservative liquid. Find the volume of this liquid (in  $\text{cm}^3$ ) Give your answer to the nearest integer.



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**203.** A storage tank is in the form of cube. When it is full of water, the volume of water is  $15.625\text{cm}^3$ . If the present depth of water is 1.3 m, find the volume of water already used from the tank.



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**204.** How many square metres of canvase is requierd for a conical tent whose height is 3.5 m and the radius of the base is 12 m?





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**205.** Two solid spheres made of the same metal have weights 5920g and 740 g, respectively. Determine the radius of the larger sphere. If the diameter of the smaller one is 5 cm.



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**206.** Find the amount of water displaced by a solid spherical ball of diameter 28 m.



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**207.** A school provides milk to the students daily in cylindrical glasses of diameter 7 cm. if the glass is filled with milk upto an height of 12 cm, find how many litres of milk is needed to seved 1600 students.



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**208.** A cylindrical roller 2.5 m in length, 1.75 m in radius when rolled on a road was found to cover the area of  $5500m^2$ . How many revolutions did it make?



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**209.** A small village having a population of 5000, requires 75 litres of water per head per day. The village has got an overhead tank of



measurement  $40m \times 25m \times 15m$ . The how many days will the water of this tank last?



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**210.** A right circular with sides 6cm, 8cm and 10 cm is revolved about the side 8 cm. find the volume and the curved surface area of the solid so formed.



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**211.** 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?



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**212.** A cylindrical tube opened at both ends is made of iron sheet which is 2cm thick. If the outer diameter is 15 cm and its length is

100cm, find how many cubic centimeters of iron has been used in making the tube?



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**213.** A semi circular sheet of metal of diameter 28 cm is bent to form an open conical cup. Find the capacity of the cup.



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**214.** A cloth having an area of  $165m^2$  is shaped into the form of a conical tent of radius 5m. How many students can sit in the tent if a student, on the average occupies  $\frac{5}{7}m^2$  on the ground.



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**215.** A cloth having an area of  $165m^2$  is shaped into the form of a conical tent of radius 5m. Find the volume of the cone.





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**216.** The water for a factory is stored in a hemispherical tank whose internal diameter is 14 m. The tank contains 50 kilo litres of water. Water is pumped into the tank to fill to its capacity. Calculate the volume of water pumped into the tank.



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**217.** The volumes of the two spheres are in the ratio 64:27. Find the ratio of their surface areas.



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**218.** A cube of side 4 cm contains a sphere touching its sides. Find the volume of the gap in between.



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**219.** 30 circular plates, each of radius 14 cm and thickness 3 cm are placed in one above the another to form a cylindrical solid. Find the total surface area.



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**220.** 30 circular plates, each of radius 14 cm and thickness 3 cm are placed in one above the another to form a cylindrical solid. Find volume of the cylinder so formed.



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**221.** A sphere and a right circular cylinder of the same radius have equal volumes. By what percentage does the diameter of the cylinder exceed its height?



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**Exercise**



1. Find the lateral surface and total surface area of a cuboid of length 80 cm, breadth 40 cm and height 20 cm.



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2. Find the total lateral surface area of a cube of edge is 10 cm.



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3. The lateral surface area of a cube is 1014 sq.cm, find the main diagonal of the cube.



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4. The lateral surface area of a cube is  $64m^2$  find its total surface area.



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5. Find the ratio of the total surface area and lateral surface area of a cube.



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6. The dimensions of a room are  $5m \times 4m \times 3m$ . Find the cost of white washing the walls of the room and the ceiling at the rate of  $Rs11.5perm^2$ .



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7. Find the length of the longest rod that can be placed in a room 12 m long 9 m broad and 8 m high.



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8. Can we construct a cube whose length of main diagonal is  $13\sqrt{3}cm$  and diagonal of the face is  $12\sqrt{2}cm$ ?



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9. Three equal cubes are placed adjacently in a row. Find the ratio of total surface of the new cuboid to that of the sum of their surface areas of the three cubes.



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10. The momentum of a body is increased by 50% what is the percentage increase in its K. E.?



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**11.** The cost of preparing the walls of a room 12 m long at the rate of Rs 1.35 per square metre is Rs 340.20 and the cost of matting the floor at 85 paise per square metre is Rs 91.80 find the height of the room.



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**12.** The length and breadth of a room are in the ratio 4:3 and its height is 5.5 meters. The cost of decorating its wall including doors and

windows at Rs 6.60 per square metre is Rs 5082. find the length and breadth of the room.



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**13.** A class room is 7 m long, 6.5 m wide and 4 m high. It has one door 3 m x 1.5 m and three windows, each measuring 2 m x 1 m. The interior walls are to be colour washed. The contractor charges Rs 5.25 per sq. m. Find the cost of colour washing.



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**14.** If  $V$  is the volume of a cuboid of dimensions  $a, b, c$  and  $S$  is its surface area, then prove that

$$\frac{1}{V} = \frac{2}{S} \left( \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right)$$



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**15.** The areas of three adjacent faces of a cuboid are  $x, y$  and  $z$ . if the volume is  $V$ , prove that  $V^2 = xyz$ .



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**16.** Find the volume of the cuboid whose dimensions are

length=26m, breadth=14m and height=6.5m



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**17.** Find the volume of the cuboid whose dimensions are

length=24 m, breadth=25 m and height =6m.



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**18.** If the areas of three adjacent faces of a cuboid are  $8\text{cm}^2$ ,  $18\text{cm}^2$  and  $25\text{cm}^2$ . Find the volume of the cuboid.



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**19.** The breadth of a room is twice its height and is half of its length. The volume of room is  $512\text{dm}^3$ . Its dimensions are :



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20. Two cubes, each of volume  $512\text{cm}^3$  are joined end to end. Find the surface area of the resulting cuboid.



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21. How many planks of dimensions  $(5\text{m} \times 25\text{cm} \times 10\text{cm})$  can be stored in a pit which is 20 m long, 6m wide and 80 cm deep?



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**22.** How many bricks will be required to construct a wall 12 m three smaller cubes. If the edges of the two smaller cubes are 6 cm and 8 cm, find the edge of the third smaller cube.



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**23.** Given that 1 cubic cm of marble weights 0.25 kg, the weight of marble block 28 cm in

width and 5 cm thick is 112kg. Find the length of the block.



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**24.** A river 3 m deep and 40 m wide is flowing at the rate of 2 km per hour. How much water will fall into the sea in a minute?



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**25.** How many persons can be accommodated in a dining hall of dimensions  $(20\text{cm} \times 16\text{cm} \times 4.5\text{cm})$ , assuming that each person requires 5 cubic metres of air?



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**26.** The volume of a cuboid is  $1536\text{cm}^3$ . Its length is 16 m and its breadth and height are in the ratio 3:2. Find the breadth and height of the cuboid.





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**27.** In a shower, 5 cm of rain falls, find the volume of water that falls on 2 hectares of ground.



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**28.** A rectangular container, whose base is a square of side 5 cm, stands on a horizontal table, and holds water up to 1 cm from the top. When a cube is placed in the water it is

completely submerged, the water rises to the top and 2 cubic cm of water overflows. Calculate the volume of the cube and also the length of its edge.



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**29.** A field is in the form of a rectangle of length 18 m and width 15 m. A pit, 7.5 m long, 6 m broad and 0.8 m deep, is dug in a corner of the field and the earth taken out is spread over the remaining area of the field. Find out



the extent to which the level of the field has been raised.



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**30.** A rectangular tank is 80 m long and 25 m broad water flows into it through a pipe whose cross section is  $25\text{cm}^2$ , at the rate of 16 km per hour. How much the level of the water rises in the tank in 45 minutes.



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**31.** Find the curved surface area of a right circular cylinder at height 21 cm and base radius 5 cm.



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**32.** The diameter of a cylinder is 28 cm and its height is 40 cm. find the curved surface area and the total surface area of the cylinder.



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**33.** A solid cylinder has total surface area of  $462\text{cm}^2$ . Its curved surface area of one third of its total surface area. Find the radius and height of the cylinder.



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**34.** Find the ratio between the total surface area of a cylinder to its curved surface area, given that its height and radius are 7.5 cm and 3.5 cm respectively.



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**35.** The total surface area of a hollow metal cylinder, open at both ends, of external radius 8cm and height 10cm is  $338\pi cm^2$ . Taking  $r$  cm to be inner radius, write down an equation in  $r$  and use it to find the thickness of the metal in the cylinder.



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**36.** The diameter of a roller 1.5 m long is 84 cm. If it takes 100 revolutions to level a

playground, find the cost of levelling this ground at the rate of 50 paise per square meter.



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**37.** A cylindrical vessel, without lid, has to be tin-coated on its both sides. If the radius of the base is 70cm and its height is 1.4m, calculate the cost of tin-coating at the rate of Rs. 3.50 per  $1000\text{cm}^2$ .



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**38.** 50 circular plates each of radius 7 cm and 1 thickness  $\frac{1}{2}$  cm are placed one above another to form a solid right circular cylinder. Find the total surface area and volume of the cylinder so formed.



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**39.** The area of the curved surface of a cylinder is 4400 sq.cm and the circumference of its base is 110 cm. find the height of the cylinder.



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**40.** Forty cylindrical pillars of the building are to be cleaned. If the diameter of the pillar is 0.50 m and height is 4 m. find the cost of cleaning them at the rate of Rs 2.50 *perm*<sup>2</sup>.



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**41.** Find the cost of sinking tube well 280 m deep having diameter 3 m at the rate of Rs

$3.60 \text{ perm}^2$ ?



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**42.** The diameter of a cylindrical well is 4.5 m and depth of the well is 14m. Find the cost of cementing its inner curved surface at the rate of Rs 12.50 per sq. metre.



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**43.** Find the volume of a right circular cylinder of height 21 cm and base radius 5 cm.



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**44.** The diameter of a cylinder is 28 cm and its height is 40 cm. find the volume of the cylinder.



**Watch Video Solution**

**45.** The area of the curved surface of a cylinder is 4400 sq.cm and the circumference of its base is 110 cm. find the height of the cylinder.



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**46.** The sum of the radius of the base and the height of a solid cylinder is 37 cm. If the total surface area of the solid cylinder is  $1628 \text{ cm}^2$ , find the volume of the cylinder.



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**47.** The ratio between curved surface area and total surface area of right circular cylinder is  $1:2$  find the ratio between the height and the radius of the cylinder.



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**48.** The radii of two cylinders are in the ratio  $2:3$  and their heights are in the ratio  $5:3$ . Calculate the ratio of their volumes and the ratio of their curved surfaces.



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**49.** The ratio between the radius of the base and the height of cylindrical is 2:3. Find the total surface area of the cylinder, if its volume is  $1617\text{cm}^3$



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**50.** The curved surface area of a cylindrical pillar is  $264\text{m}^2$  and its volume is  $924\text{m}^3$ . Find

the diameter and the height of the pillar.



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**51.** Find the weight of a lead pipe 3.5 m long.

The external diameter of pipe is 2.4 cm and

thickness of the pipe is 3 mm and 1 cm. of lead

weights 10 g.



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**52.** How many cubic metres of earth must be dug out to sink a well 14 m deep and 4 m in diameter? What will it cost to plaster its inner surface at Rs 2.50 per square metre?



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**53.** A powder tin has a square base with side 12 cm and height 17.5 cm. another is cylindrical with diameter of its base 12 cm and height 17.5

cm. which has more more capacity and by how much?



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**54.** A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness. Find the thickness of the wire.



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**55.** The trunk of a tree is cylindrical and its circumference is 176 cm. If the length of the trunk is 3 m, find the volume of the timber that can be obtained from the trunk.



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**56.** Water flows out through a circular pipe whose internal diameter is 2 cm, at the rate of 6 metres per second into a cylindrical tank. The water is collected in a cylindrical vessel,



radius of whose base is 60 cm. find the rise in the level of water in 30 minutes?



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**57.** From a top of inner radius 0.75 cm, water flows at the rate of 7 m per second. Find the volume in litres of water delivered by the pipe in one hours.



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**58.** A well of diameter 2 m is dug 14 m deep. The earth taken out of it is spread evenly all around it to a width of 5 m do form an embankment. Find the height of the embankment.



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**59.** A rectangular sheet of paper  $30\text{cm} \times 18\text{cm}$  can be transformed into the curved surface of a right circular cylinder in

two ways namely, either by rolling the paper along its length or by rolling it along its breadth. Find the ratio of the volumes of the two cylinders, thus formed.



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**60.** The barrel of a fountain-pen, cylindrical in shape, is 7 cm long and 5 mm in diameter. A full barrel of ink in the pen will be used up on writing 330 words on an average. How many

words would use up a bottle of ink containing one fifth of a litre ?



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61. Water is flowing at the rate of  $3\text{ km/h}$  through a circular pipe of  $20\text{ cm}$  internal diameter into a circular pipe of into a circular cisten of diameter  $10\text{ m}$  and depth  $2\text{ m}$ . in how much time, will the cistern be filled?



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**62.** A cylindrical water tank of diameter 1.4 m and height 2.1 m is being fed by a pipe of diameter 3.5 cm through which water flows at the rate of 2 metre per second. In how many time the tank will be filled?



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**63.** Find the curved area of a cone, if its slant height is 60 cm and the radius of its base is 21 cm.



**Watch Video Solution**

**64.** The radius of a cone is 7 cm and area of curved surface is  $176\text{cm}^2$ . Find the slant height.



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**65.** The radius of a cone is 5 cm and vertical height is 12 cm. find the area of a curved surface.



**Watch Video Solution**

**66.** find the total surface area of a right circular cone with radius 6 cm and height 8 cm.



**Watch Video Solution**

**67.** The height of a cone is 21 cm. find the area of the base if the slant height is 28 cm.



**Watch Video Solution**

**68.** The radius of the slant height of a cone are in the ratio of 4:7. if its curved surface area is  $792\text{cm}^2$ . Find its radius.



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**69.** The area of the curved surface of a cone is  $60\pi\text{cm}^2$ . If the slant height of the cone be 8 cm, find the radius of the base.



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70. The diameter of two cones are equal. If their slant height  $s$  are in the ratio 5:4. find the ratio of their curved surface areas.



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71. There are two cones, the curved surface area of one is twice that of the other. The slant height of the later is twice that of the former. Find the ratio of their radii.



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**72.** A tent of height 33 m is in the form of a right circular cylinder of diameter 120 m and height 22 m surmounted by a right circular cone of the same diameter. Find the cost of canvas of the tent at the rate of  $Rs\ 1.50\text{per}\text{m}^2$ .



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**73.** A cylinder and a cone have equal radii of their bases and equal heights. If their curved surface areas are in the ratio 8:5, show that

the radius of each is to be height of each as

3:4



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**74.** The curved surface area of a cone exceeds the base area by  $88\text{cm}^2$  its slant height exceeds the base radius by 4 cm. find the radius of the base.



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**75.** A tent is in the form of a right circular cylinder, surmounted by a cone. The diameter of the cylinder is 24 m. The height of the cylindrical portion is 11 m, while the vertex of the cone is 16 m above the ground. Find the area of the canvas required for the tent.



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**76.** A circus tent is cylindrical upto a height of 3 m and conical above it. If the diameter of the

base is 105 m and the slant height of the conical part is 53 m, find the total cost of the canvas used to make the tent when the cost per square metre of the canvas is ? 10.



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**77.** A metallic toy is in the shape of a cylinder whose both ends are conical in shape diameter of circular cross-section of cylinder is 6 cm and its height is 10 cm the length of the

toy is 18 cm find the cost of gold plating it

*Rs. 100 per  $cm^2$ .*



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**78.** Find the volume of a right circular cone  
with

Radius 4 m and height 9 m.



**Watch Video Solution**

**79.** Find the volume of a right circular cone with

Diameter 5 m and height 5 m



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**80.** The height of a right circular cone is 12 cm. if its volume is  $100\pi cm^3$ , find its radius.



**Watch Video Solution**

**81.** Vertical height of a right circular cone is four times its radius and its volume is  $36\pi cm^3$ .

Find the height.



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**82.** Find the volume of a cone having radius of the base 35 cm and slant height 37 cm.



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**83.** Two cones have their heights in the ratio 1:3 and the radii of their bases in the ratio 3:1. show that their volumes are in the ratio 3:1.



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**84.** The ratio of volumes of two cones is 4:5 and the ratio of the radii of their bases is 2:3. find the ratio of their vertical heights.



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**85.** The radius and the height of a right circular cone are in the ratio 5 : 12. If its volume is  $314\text{cm}^3$ , find the slant height and the radius of the cone. [Use  $\pi = 3.14$ ]



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**86.** If the radius of the base of a cone is halved, keeping the height same, what is the ratio of the volume of the reduced cone to that of the original cone?



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**87.** Find the weight of a solid cone whose base is of diameter 14 cm and vertical height 51 cm, supporting the material of which it is made weighs 10 grams per cubic cm.



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**88.** A right angled triangle of which the sides containing the right angle are 6.3cm and 10cm in length, is made to turn around on the

longer side. Find the volume of the solid thus generated.



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**89.** A tent is in the form of right circular cone of height 6m , the diameter of base 7m . If 12 adults can sleep in it , find the average cubic metre of air space required per adult.



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**90.** A right circular cone is 3.6 cm high and the radius of its base is 1.6 cm. It is melted and recast into a right circular cone with radius of its base as 1.2 cm. Find its height.



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**91.** A conical vessel whose internal radius is 5 cm and height of 24 cm is full of water. The water is emptied into a cylindrical vessel with

internal radius 10 cm. Find the height to which the liquid rises.



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**92.** An iron pillar consists of a cylindrical portion 2.8 m high and 20 cm in diameter and a cone 42 cm. high is surmounting it. Find the weight of the pillar, given that  $1\text{cm}^3$  of iron weights 7.5 g.



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**93.** From a solid right circular cylinder with height 10 cm and radius of the base 6 cm, a right circular cone of the same height and base is removed. Find the volume of the remaining solid.



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**94.** Water flows at the rate of 10 metres per minute through a cylindrical pipe 5 mm in diameter. How long would it take to fill a

conical vessel whose diameter at the surface is 40 cm and depth  $24\text{cm}^2$ .

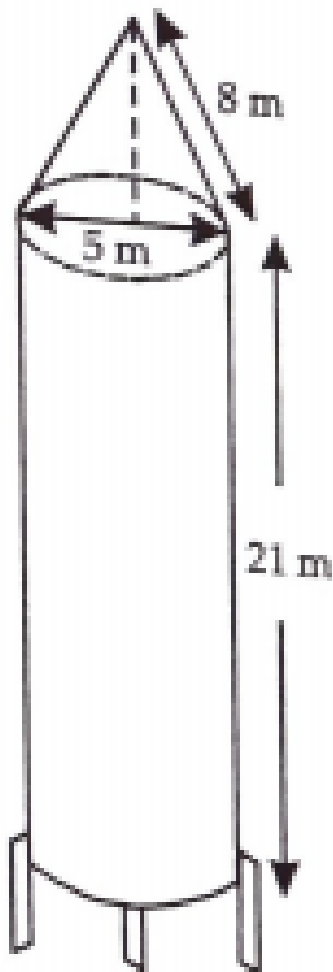


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**95.** A rocket is in the form of a circular cylinder closed at the lower end with a cone of the same radius attached to the top. The cylinder is of radius 2.5m and height 21m and the cone has the slant height 8m. Calculate the total



surface area and the volume of the rocket.



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**96.** Find the surface area of the sphere of radius:

10.5 cm



**Watch Video Solution**

**97.** Find the surface area of the sphere of radius:

5 cm?



**Watch Video Solution**

**98.** Find the surface area of a sphere of diameter

14 cm?



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**99.** Assume  $\pi = \frac{22}{7}$ , unless stated otherwise .

Find the surface area of a sphere of diameter :

21 cm



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**100.** Find the curved surface area and total surface area of hemisphere of radius 14 cm.



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**101.** The surface area of a sphere is  $5544\text{cm}^2$  find diameter.



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**102.** The diameter of the moon is approximately one fourth the diameter of the

earth. Find the ratio of their surface area.



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**103.** If diameter of a sphere is decreased by 25% then what percent does its curved surface area decrease ?



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**104.** The surface area of a sphere is same as the curved surface area of a cone having the

radius of base as 120 cm and height 160 cm.

find the radius of the sphere.



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**105.** Assuming the earth to be a sphere of radius 6370 km, how many square kilometers is area of the land, if three-fourth of the earth's surface is covered by water.



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**106.** The radius of a spherical balloon increases from 6 cm to 12 cm. Compare the surface areas of the balloon in the two cases.



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**107.** A dome of a building is in the form of a hemisphere. From inside, it was white washed at the cost of Rs 498.96. If the cost of white-washing is at the rate of Rs 2.00 per

square metre, find the inner surface area of the dome.



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



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**109.** The internal and external diameters of a hollow hemispherical vessel are 24 cm and 25 cm respectively. Find the cost of painting the vessel all over, at the rate of 5 paise per sq.cm.



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**110.** Find the volume of a sphere whose radius is : 3.5 cm.



**Watch Video Solution**

**111.** Find the volume of a sphere whose radius is  
5 m



**Watch Video Solution**

**112.** Find the surface area of a sphere whose volume is  $4851\text{cm}^3$ .



**Watch Video Solution**

**113.** The volume of a sphere is  $38808\text{cm}^3$ . Find its radius and hence its surface area.



**Watch Video Solution**

**114.** The surface area of a sphere is  $576\pi\text{cm}^2$ . Find its volume.



**Watch Video Solution**

**115.** A hemispherical tank has inner radius of 2.8 m. find its capacity in litres.



**Watch Video Solution**

**116.** If the radius of a sphere is doubled, what is the ratio of the volume of the first sphere to that of the second sphere?



**Watch Video Solution**

**117.** A hemispherical tank has inner radius of 2.8 m. find its capacity in litres.



**Watch Video Solution**

**118.** If the radius of a sphere is doubled, what is the ratio of the volume of the first sphere to that of the second sphere?



**Watch Video Solution**

**119.** A hemisphere of a lead of radius 7 cm is cast into a right circular cone of height 49 cm, find the radius of the base.



**Watch Video Solution**

**120.** The outer diameter of a spherical shell is 10 cm and the inner diameter is 9 cm. find the volume of the metal contained in the shell.



**Watch Video Solution**

**121.** A cone and a hemispher have equal bases and equal volumes. Find the ratio of their lenghts.



**Watch Video Solution**

**122.** A hemispherical bowl is made of steel 0.25 cm thick. The inner radius of the bowl is 5 cm. Find the volume of steel used in making the bowl. [ Take  $\pi = 3.14$  ]



**Watch Video Solution**

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



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**124.** A cylinder whose height is two thirds of its diameter has the same volume as a sphere of radius 4 cm. calculate the radius of the base of the cylinder.



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**125.** The diameter of a copper sphere is 6 cm. The sphere is melted and is drawn into a long wire of uniform circular cross section. If the length of the wire is 36 cm, find its radius.



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**126.** The diameter of a copper sphere is 6 cm. It is beaten and drawn into a wire of diameter 0.2 cm. Find the length of wire.



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**127.** How many lead shots each 0.3 cm in diameter be can made from a cuboid of dimension  $9\text{cm} \times 11\text{cm} \times 12\text{cm}$  ?



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**128.** A spherical ball of lead 3 cm in diameter is melted and re casted into three spherical balls. If the diameter of two balls be  $\frac{3}{2}$  cm and 2 cm, find the diameter of the third ball.



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**129.** A measuring jar of internal diameter 10 cm is partially filled with water. Four equal spherical balls of diameter 2 cm each is dropped in it and they sink down in water completely. What will be the change in the level of water in the jar?



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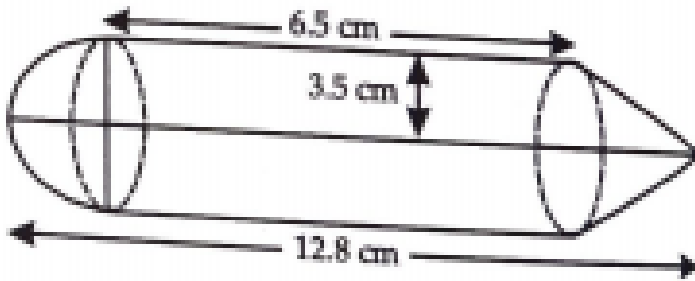
**130.** The interior of a building is in the form of a right circular cylinder of diameter 4.2 m and height 4 m, surmounted by a cone. The vertical height of the cone is 2.1 m. Find the outer surface area and volume of the building.



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**131.** In the Fig., solid consists of a cylindrical section of length 6.5 cm and surmounted by a cone at one end, a hemisphere at the other

end. Given that common radius is 3.5 cm and the total height of solid is 12.8 cm find the volume of solid



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**132.** A cylindrical tub of radius 12 cm contains water to a depth of 20 cm. A spherical ball is dropped into the tub and the level of the

water is raised by 6.75 cm. Find the radius of the ball.



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**133.** If the total surface area of a cube is  $54x^2$ .

Find its lateral surface.



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**134.** Find the total surface area of a cuboid which is 6 cm long, 7 cm wide and 8 cm high.



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**135.** Find the edge of a cube whose surface area is  $432m^2$ .



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**136.** The surface area of a cuboid is  $1300cm^2$ . If its length is 15 cm and height is 20 0cm, find its breadth.



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**137.** If two cubes, each of side 6 cm are joined face to face, then find the volume of the resulting cuboid?



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**138.** Write the number of surfaces of a right circular cylinder.



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**139.** Base radius of two cylinder are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. The ratio of their volumes is :



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**140.** The height of a cone is 15 cm. if its volume is  $500\pi\text{cm}^3$ . Then find the radius of its base.



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**141.** The height and the slant height of a cone are 21 cm and 28 cm respectively. Find the volume of the cone.



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**142.** Find the volume of the largest right circular cone that can be placed in a cube of edge 14 cm,



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**143.** Find the length of cloth used in making a conical pandal of height 100 m and base radius 240 m, if cloth is  $100\pi$  m wide.



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**144.** Find the surface area of a sphere of radius 14 cm.



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**145.** Find the volume of the sphere whose surface area is  $154\text{cm}^2$ .



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**146.** If a sphere of radius  $2r$  has the same volume as that of a cone with circular base of radius  $r$ , then find the height of the cone.



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**147.** If a sphere is inscribed in a cube, find the ratio of the volume of cube to the volume of the sphere.



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**148.** Find the total surface area of a hemisphere of radius 16 cm.



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**149.** The surface area of a sphere of radius 5 cm is five times the area of the curved surface of a cone of radius 4 cm, find the height of the cone.



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**150.** Find the maximum volume of a cone that can be carved out a solid hemisphere of radius  $r$ .



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**151.** What amount of milk that a hemispherical bowl of radius 10 0cm can hold?



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**152.** If the volumes of two spheres are in the ratio 6: 27, find the ratio of their surfaces areas.



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**153. True/false**

Two identical solid cubes of side  $a$  are joined end to end. Then the total surface area of resulting cuboid is  $12a^2$ .



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**154. True/false**

Two identical solid hemispheres of equal base radius  $r$  cm stuck together along their bases. The total surface area of the combination is  $6\pi r^2$ .





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**155.** True/false

IF the volumes of two spheres are in the ratio 64:27, then the ratio of their surfaces areas is 16:9.



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**156.** True/false

The largest possible right circular cone is cut

out of a cube of edge  $r$  cm. The volume of the

cone is  $\frac{1}{12}\pi r^3$ .



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**157.** True/false

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



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**158.** If the length of the diagonal of a cube is  $6\sqrt{3}$  cm, then the length of the edge of the cube is 3 cm.



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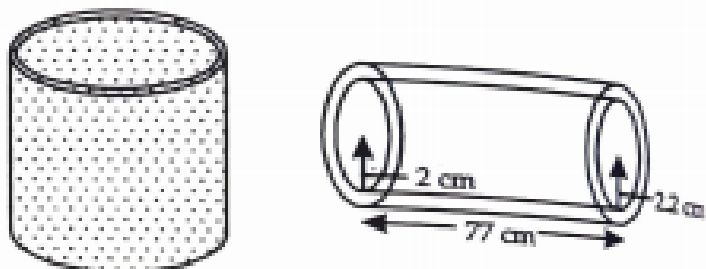
**159.** True/false

For a right circular of base radius 7 cm and height 14 cm, total area of end faces  $154\text{cm}^2$ .



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**160.** A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter being 4.4 cm.



Find outer curved surface area.



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**161.** True/false

In case of a hollow cylinder. Inner curved

surface area of a hollow cylinder =  $2\pi h(R - r)$



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**162.** True/false

If total surface of a cube of side is  $294\text{cm}^3$ ,  
then  $a=8\text{cm}$ .



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**163.** Fill ups

Diagonal of a cuboid dimensions  $l \times b \times h$  is

..... .



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**164. Fill ups**

The principal diagonal of a cube of edge  $a$  is  
.....whereas diagonal of its base is.....



**Watch Video Solution**

**165. Fill ups**

The dimensions of a cuboidal vessel are

$100m \times 5m \times 2m$ , it can hold.....kilolitre of petrol.



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**166.** Fill ups

The capacity of a cuboidal tank is 50 kl, if its length and depth are 2.5 m and 10 m respectively, then its bradth is.....



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**167. Fill ups**

.....times the volume of a cone is equal to volume of cylinder having height and radius same as that of cone.



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**168. Fill ups**

The curved surface area of a hollow cylinder of height  $h$  with external and internal radius as  $R$  and  $r$  is..... .







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**169.** Fill ups

The surface area generated by revolving a bangle about one of its diameters is.....times the areas of a bangle.



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**170.** Fill ups

The number of children each holding an empty cone of radius 2 cm and heigh 7 cm, who can

be served from a cubical ice cream brick of edge 22 cm is.....



[Watch Video Solution](#)

**171.** Fill ups

The number of conical vessels required to empty the completely filled cylinder of same height and base radius is..... .



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**172. Fill ups**

If a metallic hemisphere is recasted into a sphere, then radius of old radius of new radius area .....



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**173.** The length breadth and height of cuboid are 15 m, 6m and 5 dm respectively. The lateral surface area of the cuboid is

A.  $45m^2$

B.  $201m^2$

C.  $21m^2$

D.  $90m^2$

**Answer:**



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**174.** What is the maximum length of a pencil that can be placed in a rectangular box of dimensions  $(8cm \times 6cm \times 5cm)$ ?

A. 1) 8cm

B. 2) 19 cm

C. 3) 9.5 cm

D. 4) 11.2 cm

**Answer:**



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**175.** How many bricks will be required to construct a wall 8 m long, 6 m high and 22.5

cm thick if each brick measures 25 cm long, 11.25 cm high and 6 cm?

A. 5600

B. 4800

C. 5200

D. 6400

**Answer:**



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**176.** The lateral surface area of a cube is  $256\text{cm}^2$ . The volume of the cube is

A.  $64\text{cm}^3$

B.  $256\text{cm}^3$

C.  $256\text{m}^3$

D.  $512\text{m}^3$

**Answer:**



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177. The volume of a cube is  $512\text{cm}^3$ . Its total surface area is

A.  $384\text{cm}^2$

B.  $256\text{cm}^2$

C.  $512\text{cm}^2$

D.  $64\text{cm}^2$

**Answer:**



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**178.** Three cubes of metal with edges 3 cm, 4 cm and 5 cm respectively are melted to form a single cube. The lateral surface area of the new cube formed is

A.  $144\text{cm}^2$

B.  $72\text{cm}^2$

C.  $256\text{cm}^2$

D.  $128\text{cm}^2$

**Answer:**



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**179.** Two cubes have their volumes in the ratio 1:27. the ratio of their surfacs area is

A. 1 : 8

B. 1 : 3

C. 1 : 8

D. 1 : 9

**Answer:**



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**180.** The diameter of the base of a cylinder is 6 cm and its height is 14 cm. the volume of the cylinder is

A.  $198\text{cm}^3$

B.  $396\text{cm}^3$

C.  $495\text{cm}^3$

D.  $297\text{cm}^3$

**Answer:**



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**181.** If the curved surface area of a cylinder is  $1760\text{cm}^2$ . And its base radius is 14 cm. then its height is

A. 10cm

B. 20cm

C. 15 cm

D. 40 cm

**Answer:**



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**182.** Vertical cross section of a right circular cylinder is always a

A. square

B. rhombus

C. rectangle

D. trapezium

**Answer:**



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**183.** The number of surfaces of a hollow cylindrical object is

A. 1

B. 2

C. 3

D. 4

**Answer:**



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**184.** If the height of a cylinder is doubled and radius remains the same, then volume will be

A. doubled

B. same

C. halved

D. four times

**Answer:**



**Watch Video Solution**

**185.** If the height of a cylinder is doubled, by what number must the radius of the base be multiplied so that the resulting cylinder has the same volume as the original cylinder

A. 4

B. 2

C.  $\frac{1}{\sqrt{2}}$

D.  $\frac{1}{2}$

**Answer:**



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**186.** The height  $h$  of a cylinder equal the circumference of the cylinder. In terms of  $h$ , what is the volume of the cylinder?

A.  $\frac{h^3}{4\pi}$

B.  $\frac{h^2}{2\pi}$

C.  $\frac{h^3}{2}$

D.  $\pi h^3$

**Answer:**



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**187.** Two steel sheets each of length  $a_1$  and breadth  $a_2$  are used to prepare the surfaces of two right circular cylinders-one having volume  $v_1$  and height  $a_2$  and other having volume  $v_2$  and height  $a_1$  then

A.  $v_1 = v_2$

B.  $a_1 v_1 = a_2 v_2$

C.  $a_2 v_1 = a_1 v_2$

D.  $\frac{v_1}{a_1} = \frac{v_2}{a_2}$

**Answer:**



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**188.** The radius of a wire is decreased to one third. If volume remains the same, the length will become

A. 3 times

B. 6 times

C. 9 times

D. 27 times

**Answer:**



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**189.** The height of a cone is 21 cm and its slant height is 28 cm. the volume of the cone is

A.  $7356\text{cm}^3$

B.  $7506\text{cm}^3$

C.  $7546\text{cm}^3$

D.  $7564\text{cm}^3$

**Answer:**



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**190.** If the volumes of two cones be in the ratio 1:4 and the radii of their bases be in the ratio 4:5, then the ratio of their heights is

A. 1 : 5

B. 25 : 16

C. 5 : 4

D. 25 : 64

**Answer:**



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**191.** The ratio of the volumes of a right circular cylinder and a right circular cone of the same base and the same height will be

A. 1 : 3

B. 4 : 3

C. 3 : 1

D. 3 : 4

**Answer:**



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**192.** If the height and the radius of a cone are doubled, the volume of the cone becomes:

- A. 4 times
- B. 3 times
- C. 6 times
- D. 8 times

**Answer:**



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**193.** The volume of a sphere of radius 10.5 cm is

A.  $9702cm^3$

B.  $19404cm^3$

C.  $4851cm^3$

D.  $14553cm^3$



**Answer:**



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**194.** The volume of a sphere is  $38808\text{cm}^3$ . Its curved surface area is

A.  $5544\text{cm}^2$

B.  $4158\text{cm}^2$

C.  $8316\text{cm}^2$

D.  $1386\text{cm}^2$

**Answer:**



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**195.** The radius of a hemispherical balloon increases from 6 cm to 2 cm as air is being pumped into it. The ratio of the surface areas of the balloons in two cases is

A. 1 : 4

B. 2 : 3

C. 1 : 3

D. 1 : 2

**Answer:**



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**196.** A hemispherical bowl of internal radius 9 cm is full of liquid. This liquid is to be filled into cylindrical shaped small bottles each of diameter 3 cm and height 4 cm. How many bottles are necessary to empty the bowl ?

A. 63

B. 54

C. 35

D. 27

**Answer:**



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**197.** A cone and a hemispher have equal bases and equal volumes. Find the ratio of their lenghts.

A. 1 : 2

B. 4 : 1

C. 2 : 1

D.  $\sqrt{2} : 1$

**Answer:**



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**198.** The radius of a sphere is  $2r$ . Then its volume will be

A.  $\frac{4}{3}\pi r^3$

B.  $4\pi r^3$

C.  $\frac{8\pi r^3}{3}$

D.  $\frac{32}{3}\pi r^3$

**Answer:**



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**199.** The total surface area of a cube is  $96\text{cm}^2$ .

The volume of the cube is

A.  $80\text{cm}^3$

B.  $5123\text{cm}^3$

C.  $64\text{cm}^3$

D.  $27\text{cm}^3$

**Answer:**



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**200.** A cone is 8.4 cm high and the radius of its base is 2.1 cm. It is melted and recast into a sphere. The radius of the sphere is

A. 4.2 cm

B. 2.1 cm

C. 2.4 cm

D. 1.6 cm

**Answer:**



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**201.** In a cylinder radius is doubled and height is halved, curved surface area will be



A. halved

B. doubled

C. same

D. four times

**Answer:**



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**202.** The total surface area of a cone whose radius is  $\frac{r}{2}$  and slant height  $2l$  is

A.  $2\pi r(l + r)$

B.  $\pi r \left( l + \frac{\pi}{4} \right)$

C.  $\pi r(l + r)$

D.  $2\pi r$

**Answer:**



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**203.** Base radius of two cylinder are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. The ratio of their volumes is :

A. 1017

B. 20:27

C. 17:27

D. 20:37

**Answer:**



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**204.** The lateral surface area of a cube is  $256\text{cm}^2$ . The volume of the cube is

A.  $512m^3$

B.  $64m^3$

C.  $216m^3$

D.  $256m^3$

**Answer:**



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**205.** The number of planks of dimensions  $(4m \times 50m \times 20cm)$  that can be stored a pit which is 16 m long, 12 m wide and 40 m deep is

A. 1900

B. 1920

C. 1800

D. 1840

**Answer:**



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**206.** The length of the longest pole that can be put in a room of dimensions  $(10m \times 10m \times 5m)$  is

A. 15 m

B. 16 m

C. 10 m

D. 12m

**Answer:**



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**207.** The radius of a hemispherical balloon increases from 6 cm to 2 cm is air is being

pumped into it. The ratio of the surface areas of the balloons in two cases is

A. 1 : 4

B. 1 : 3

C. 2 : 3

D. 2 : 1

**Answer:**



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**208.** The slant height of a right circular cone is 10 cm and its height is 8 cm. It is cut by a plane parallel to its base passing through the midpoint of the height. Ratio of the volume of the cone to that of the frustum of the cone cut is

A. 2:1

B. 3:2

C. 4:3

D. 8:7



**Answer:**



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**209.** A cone and a hemispher have equal bases and equal volumes. Find the ratio of their lenghts.

A.  $2:1$

B.  $\sqrt{2}:1$

C.  $\sqrt{3}:2$

D.  $3:1$

**Answer:**



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**210.** Three solid spheres of radius 1 cm, 6 cm and 8 cm, respectively are melted together and cast into a single sphere. The radius  $r$  of this sphere will be

A.  $r > 9$  cm

B.  $r=9$  cm

C.  $9\text{cm} < r < 10\text{cm}$

$$D. r > 10cm$$

**Answer:**



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**211.** The ratio of the volumes of a right circular cylinder and a right circular cone of the same base and the same height will be

A. 1 : 3

B. 3 : 1

C. 4:3

D. 3:4

**Answer:**



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**212.** If the ratio of the volumes of two spheres is 1:8, then the ratio of their surfaces area is

A. 1:2

B. 1:4

C. 1 : 8

D. 1 : 16

**Answer:**



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**213.** If a solid sphere of radius  $r$  is melted and cast into the shape of a solid cone of height  $r$ , then the radius of the base of the cone is

A.  $2r$

B.  $r$

C.  $4r$

D.  $3r$

**Answer:**



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**214.** A cone of semi vertical angle of  $\alpha$  is inscribed in a sphere of radius 2 cm. the height of the cone is

A. 1)  $4 \sin^2 \alpha$

B. 2)  $4 \cos^2 \alpha$

C. 3)  $4 \sin \alpha$

D. 4)  $4 \cos \alpha$

**Answer:**



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**215.** How many cubical blocks whose edge measures 3 cm can be formed by melting a cubic block of metal whose edge is 15 cm?



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**216.** How much length of the iron sheet 11 cm, wide is required for making an open cylinder 15 cm high and 7 cm as base radius.



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**217.** The slant side of a right circular cone is 10 m and its height 8 m. find the area of its curved surface.





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**218.** Find the lateral surface area of a cube of side is 8 cm.



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**219.** The total surface area of a cylinder is  $462\text{cm}^2$  and its curved surface area is one third of its total surface area. Find the volume of the cylinder.



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**220.** If the radius of a sphere is increased by 10%, prove that its volume will be increased by 33.1%



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**221.** The surface area of a sphere of radius 5 cm is five times the area of the curved surface of a cone of radius 4 cm, find the height of the cone.



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**222.** A well with 10 m inside diameter is dug 14 m deep. Earth taken out of its is spread all around to a width of 5 m to form an embankment. Find the height of the embankment.



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**223.** How many metres of cloth 5 m wide will be required to make a conical tent, the radius

of whose base is 7 m and whose height is 24 m?



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**224.** The volume of two spheres are in the ratio 64:27. Find the difference of their surfaces areas if the sum of their radii is 7 cm.



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**225.** The radius and height of right circular cone are in the ratio 4:3 and its volume is  $2156\text{cm}^3$ . Find the curved surface area of the cone.



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**226.** The radius of the base of a cone is 14 cm and its height is 24 cm. Find the volume, curved surface area and total surface area of the cone.





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**227.** The ratio of the curved surface area and the total surface area of a circular cylinder is 1:2 and the total surface area is  $616\text{cm}^2$ . Find its volume.



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**228.** Two cylindrical vessels are filled with oil. Their radii are 15 cm respectively and their heights are 25 cm and 18 cm respectively. Find

the radius of the cylindrical vessel 33 cm in height which will just contain the oil of the two given vessels.



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