



MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

SURFACE AREAS AND VOLUMES

Others

1. Find the value of k , if the point P (2,4) is equidistant from the

points A(5, k) and B(k, 7).



2. A solid sphere of radius 10.5 cm is melted and recast into smaller solid cones, each of radius 3.5cm and height 3cm. Find the number of cones so formed. $\left(Use\pi = \frac{22}{7}\right)$

3. From a rectangular sheet of paper ABCD with AB=40CM and

AD=28cm, a semi circular portion with BC as diameter is cut off.

Find the area of the remaining paper. $\left(Use\pi=rac{22}{7}
ight)$

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4. A card is drawn at random from a well shuffled pack of 52 playing cards. Find the probability of getting (1)neither a red card nor a queen and (2) a face card



5. In the given figure, a triangle PQR is drawn to circumscribe a circle of radius $\sqrt{3} \ cm$ such that segments RS and QS into which QR is divided by the point of contact S are of lengths 5cm and 3cm respectively. If the area of ΔPQR is $10\sqrt{3} \ cm^2$, then find the sides PQ and PR.

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6. Draw a triangle ABC with BC=7cm, $\angle B = 45^0 and \angle C = 60^0$. Then construct another triangle, whose sides are $\frac{3}{5}$ times the corresponding sides of triangle ABC.

7. Find the sum of all multiples of 7 lying between 500 and 900.



9. A solid right circular cone is cut into two parts at the middle of its height by a plane parallel to its base. The ratio of the volume of the smaller cone to the whole cone is:



B. (B) 1:4

C. (C) 1:6

D. (D) 1:8

Answer: null

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10. In the figure, AB is a diameter of the circle with centre O and

OA = 7cm. Find the area of the shaded region



11. A golf ball has diameter equal to 4.2cm. Find its capacity.

12. A bucket is in the form of a frustum of a cone and holds 15.25 litres of water. The diameters of the top and bottom are 25cm and 20cm respectively. Find its height and area of tin used in its construction.

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13. A shuttle cock used for playing badminton has the shape of a frustum of a cone mounted on a hemisphere. The diameters of the ends of the frustum are 5 cm and 2 cm; the height of the entire shuttle cock is 7 cm. Find the external surface area.



14. The radius of the base of a right circular cone of semi-vertical angle α is r. Show that its volume is $\frac{1}{3}\pi r^3 \cot \alpha$ and curved

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15. A container, opened from the top and made up of a metal sheet, is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm, respectively. Find the cost of the milk which can completely fill the container, at the rate of Rs 20 per litre.



16. A tent consists of a frustum of a cone capped by a cone. If the radii of the ends of the frustum be 13 m and 7 m, the height of the frustum be 8 m and the slant height of the conical cap be 12 m, find the canvas required for the tent.



17. The radius of the base of a right circular cone is r. It is cut by a plane parallel to the base at aheight h from the base. The slant height of the frustum is $\sqrt{h^2 + \frac{4}{9}r^2}$. Show that the volume of 13 the frustum is $\frac{13}{27}\pi r^2 h$.

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18. A right circular cone is divided by a plane parallel to its base in two equal volumes. In what ratio will the plane divide the axis of the cone?

19. If a cone of radius 10cm is divided into two parts by drawing a plane through the mid-point of its axis, parallel to its base. Compare the volumes of the two parts.



20. A solid cylinder of diameter 12cm and height 15cm is melted and recast into toys with the shape of a right circular cone mounted on a hemisphere of radius 3cm. If the height of the toy is 12cm, find the number of toys so formed.



21. A kite is flying at a height of 30m from the ground. The length of string from the kite to the ground is 60m. Assuming that

three is no slack in the string, the angle of elevation of the kite at the ground is: 45^0 (b) 30^0 (c) 60^0 (d) 90^0



22. The distance of the point (-3, 4) from the x-axis is : (a) (b)

 $-\,3$ (c) 4 (d) 5

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23. Find the value of p for which the roots of the equation

 $px(x-2)+6=0, ext{ are equal.}$

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24. How many two-digit numbers are divisible by 3?



25. In figure, a right triangle ABC, circumscribes a circle of radius r.If AB and BC are of length 8 cm and 6 cm respectively, find the value of r.



26. From each corner of a square of side 4 cm a quadrant of a circle of radius 1 cm is cut and also a circle of diameter 2 cm is cut as shown in Fig. 12.23. Find the area of the remaining portion of the square.



27. Find the area of the shaded region in Fig. 12.21, if ABCD is a

square of side 14 cm and APD and BPC are semicircles.



28. A hemispherical bowl of internal radius 9cm is full of water. Its contents are emptied in a cylindrical vessel of internal radius 6cm. Find the height of water in the cylindrical vessel.



29. The angles of the depression of the top and bottom of the tower is seen from the top of a $60\sqrt{3}$ cliff are 45^{α} and 60^{α} respectively. Find the height of the tower.



30. Find the coordinates of a point P, which lies on the line segment joining the points A(-2,-3) and B(2. -4) such that $AP = \frac{3}{7}$ AB.

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31. If the radii of the circular ends of a conical bucket, which is 16 cm high, are 20 cm and 8 cm, find the capacity and total surface area of the bucket. [Use pi= 22/7]

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32. A cylindrical hole of diameter 30cm is bored through a cuboidal wooden block with side 1meter Find the volume of the object so formed ($\pi = 3.14$)



33. The perimeters of the ends of a frustum of a right circular cone are 44 cm and 33 cm. If the height of the frustum be 16 cm, find its volume, the slant surface area and the total surface area.



34. The radii of the circular ends of a frustum of height 6cm are 14cm and 6cm respectively. Find the lateral surface area and total surface are of the frustum.



35. A toy is in the form of a hemisphere surmounted by a right circular cone of the same base radius as that of the hemisphere. If the radius of the base of the cone is 21cm and its volume is 2/3 of the volume of the hemisphere, calculate the height of the cone and the surface area of the toy. $\left(Use\pi = \frac{22}{7}\right)$.



36. An iron pole consisting of a cylindrical portion 110 cm high and of base diameter 12 cm is surmounted by a cone 9 cm high. Find the mass of the pole, given that $1 \ cm^3$ of iron has 8 gram mass approximately. (Use $\pi = 355/115$)

37. The largest cone is curved out from one face of solid cube of

side 21 cm find the volume of the remaining solid.

38. The largest possible sphere is carved out of a wooden solid cube of side 7cm. Find the volume of the wood left. $\left(Use\pi=rac{22}{7}
ight)$.

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39. The height of a right circular cone is trisected by two planes drawn parallel to the base. Show that the volumes of the three portions starting from the top are in the ratio 1:7:19.

40. A Hollow cone is cut by a plane parallel to the base and upper portion is removed. If the curved surface of the remainder is 8/9 of the curved surface of the whole cone; find the ratio of the line-segment into which the cone's altitude is divided by the plane.



41. If the numbers x-2, 4x-1 and 5x+2 are in AP., find the

value of x.

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42. Two tangents PAandPB are drawn from an external point P to a circle with centre O. Prove that AOBP is a cyclic





43. In Figure, there are shown sectors of two concentric circles of

radii 7cm and 3.5cm. Find the area of the shaded region.

$$\left(Use\pi\frac{22}{7}\right)$$

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44. How many sphereical lead shots each 4.2cm in diameter can

be obtained from a rectangular solid of lead with dimensions 66cm, 42cm, 21cm. $\left(Use\pi=rac{22}{7}
ight)$

45. Point P(5, -3) is one of the two points of trisection of the line segment joining the points A(7, -2)andB(1, -5) near to A. Find the coordinates of the other point of trisection.

46. Show that the point P(-4,2) lies on the line segment

joining the points $A(\,-4,\,6)$ and $B(\,-4,\,-6)$.

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47. Two dice are thrown at the same time. Find the probability of

getting different numbers on both dice.



48. A natural number, when increased by 12, becomes equal to

160 times its reciprocal. Find the number.

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49. Find the sum of the integers between 100 and 200 that are
divisible by 9.
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50. In the given figure, two tangents PQ and PR are drawn to a
circle with centre C from an external point P, Prove that

 $\angle QPR = 2 \angle OQR.$

51. Find the roots of the following quadratic equation: $\frac{2}{5}x^2 - x - \frac{3}{5} = 0$ **Vatch Video Solution**

52. If the circumference of a circle is equal to the perimeter of a square then the ratio of their areas is: (a)22:7 (b) 14:11 (c)

7:22 (d) 7:11

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53. The height of a cone is 60cm. A small cone is cut off at the top by a plane parallel to the base and is volume is $\frac{1}{64}th$ the volume of original cone. The height from the base at which the section is made is: (a) 15cm (b) 30cm (c) 45cm (d) 20cm

54. To draw a pair of tangents to a circle which are inclined to each other at an angle of 100° , it is required to draw tangents at end points of those two radii of the circle, the angle between which should be: 100° (b) 50° (c) 80° (d) 200°



55. Two tangents making an angle of 120^{0} with each other are drawn to a circle of radius 6cm, then the length of each tangent is equal to $\sqrt{3}$ cm (b) 6 $\sqrt{3}$ cm (c) $\sqrt{2}$ cm (d) 2 $\sqrt{3}$ cm



56. In the given figure, two tangents PQ and PR are drawn to a circle with centre O from an external point P, Prove that $\angle QPR = 2 \angle OQR$.



57. If radii of the two concentric circles are 15cm and 17cm, then

the length of each chord of one circle which is tangent to other

is: 8cm (b) 16cm (c) 30cm (d) 17cm

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58. The sum of first five multiples of 3 is: 45 (b) 65 (c)

75 (d) 90

59. Which of the following equations has the sum of its roots as

3? (a) $x^2 + 3x - 5 = 0$ (b) $-x^2 + 3x + 3 = 0$ (c) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x - 1 = 0$ (d) $3x^2 - 3x - 3 = 0$

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60. A metallic hemisphere is melted and recast in the shape of a cone with the same base radius R as that of the hemisphere. If H is the height of the cone, then write the value of H/R.



61. A drinking glass is in the shape of the frustum of a cone of height 14cm. The diameters of its two circular ends are 4cm and 2cm. Find the capacity of the glass. $\left(Use\pi = \frac{22}{7}\right)$



house and the building. the distance between the light-house and the building.

64. A military ten of height 8.25m is in the form of a right circular cylinder of base diameter 30m and height 5.5m surmounted by right circular cone of same base radius. Find the length of the canvas use in making the tent. If the breadth of the canvas is 1.5m.



65. All kings, queens are aces are removed from a pack of 52 cards. The remaining cards are well shuffled and then a card is drawn from it. Find the probability that the drawn card is : a black face card (b) a red card.



66. If the points A(x,y), B(3,6) and C(-3,4) are collinear, show that x-3y+15=0



67. Find the common difference of an A.P. whose first term is 5 and the sum of its first four terms is half the sum of the next four terms.



68. In a flight of 2800km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100km/h and time increased by 30 minutes. Find the original duration of the flight.



69. A conical vessel of radius 6cm and height 8cm is completely filled with water. A sphere is lowered into the water and its size is such that when it touches the sides, it is just immersed . What fraction of water over flows?

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70. An agriculture field is in the form of a rectangle of length 20m width 14m. A 10m deep well of diameter 7m is dug in a corner of the field and the earth taken out of the well is spread evenly over the remaining part of the field. Find the rise in its level.



71. Solid cylinder of brass 8m high and 4m diameter is melted and recast into a cone of diameter 3m. Find the height of the cone.

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72. A solid iron rectangular block of dimensions 4.4m, 2.6m and

1m is cast into a hollow cylindrical pipe of internal radius 30cm

and thickness 5cm. Find the length of the pipe.

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73. A led pencil consists of a cylindner of wood with a solid cylinder of graphite filled into it. the diameter of pencil is 7mm, the diameter of graphite is 1 mm and the length of the pencil is 10cm. Calculate the weight of the whole pencil, if the specific



74. Find the maximum volume of a cone that can be carved out

of a solid hemisphere of radius r.

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75. Water is flowing at the rate of 3km/hr through a circular pipe

of 20cm internal diameter into a circular cistern of diameter 10m

and depth 2m. In how much time will the cistern be filled?

76. Water flows at the rate of 10 meter per minute through a cylindrical pipe having its diameter as 5mm. How much time will it take to fill a conical vessel whose diameter of base is 40cm and depth 24cm?

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77. 21 glass spheres, each of radius 2cm are packed in a cuboidal box of internal dimensions 16cmx8cmx8cm and, then the box is filled with water. Find the volume of water filled in the box.



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



height of the embankment.



81. If the n^{th} term of an A.P., is $(2n+1), \,$ then the sum of its first

three terms is (a) 6n+3 (b) 15 (c) 12 (d) 21



82. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12cm. Length PQ is :

(A) 12 cm (B) 13 cm (C) 8.5 cm (D) $\sqrt{119}$ cm.



83. From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the tower.



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85. Find the area of the quadrilateral ABCD , in which

AB=7cm, BC=6cm, CD=12cm, DA=15cmandAC=9cm

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86. The circumference of a circle is 22cm. The area of its quadrant

$$ig(\in cm^2ig)$$
 is: $rac{77}{2}$ (b) $rac{77}{4}$ (c) $rac{77}{8}$ (d) $rac{77}{16}$

87. A hemisphereical bowl of internal diameter 36cm contains a liquid. This liquid is to be filled in cylindrical bottles of radius 3cm and height 6cm. How many bottles are required to empty.

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88. How many sphereical lead shots each 4.2cm in diameter can be obtained from a rectangular solid of lead with dimensions 66cm, 42cm, 21cm. $\left(Use\pi = \frac{22}{7}\right)$

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89. 2 cubes each of volume $64 ext{ } cm^3$ are joined end to end. Find the surface area of the resulting cuboid.

90. The diameter of a metallic sphere is 6cm. The sphere is melted and drawn into a wire of uniform cross-section. If the length of the wire is 36m, find its radius.

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91. Three cubes whose edges measure 3cm, 4cm and 5cm respectively to form a single cube. Find its edge. Also, find the surface area of the new cube.



92. A cone of height 24 cm and radius of base 6 cm is made up of modelling clay. A child reshapes it in the form of a sphere. Find




93. The diameter of a metallic sphere is 6cm. The sphere is melted and drawn into a wire of uniform cross-section. If the length of the wire is 36m, find its radius.

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94. A solid sphere of radius 3cm is melted and then cast into small spherical balls each of diameter 0.6cm. Find the number of balls thus obtained.



95. If the diameter of cross-section of a wire is decreased by 5% how much percent will the length be increased so that the volume remains the same?

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96. In Figure, OABC is a squaer inscribed in a quadrant OPBQ. If

OA=20cm, find the are of shaded region. $[Use\pi=3.~14.~]$



97. Draw a triangle ABC with side BC=6CM, AB=5CM and $\angle ABC = 60^0$. Then construct a triangle whose sides are $\frac{3}{4}$ time the corresponding sides of ABC.

98. A tower stands near an airport. The angle of elevation θ of the tower from a point on the ground such that its tangent is $\frac{5}{12}$. Find the height of the tower, if the distance of the observer from the tower is 120m.



99. A hemispherical depression is cut out from one face of a cubical wooden block such that the diameter 'l' of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.



100. The points A(2, 9), B(a, 5), C(5, 5) are the vertices of a triangle ABC right angled at B. Find the value of a and hence the area of ABC.



102. A train travels at a certain average speed for a distance of 63km and then travels a distance of 72km at an average speed of 6 km/hr more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?



103. Cards with numbers 2 to 101 are placed in a box. A card is selected at random from the box. Find the probability that the card which is selected has a number which is a perfect square.



104. A sum of Rs. 1400 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each prize is Rs.40 less than the preceding price, find the value of each of the prizes.

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105. Find two consecutive odd positive integers, sum of whose

squares is 290.



106. A golf ball has diameter equal to 4.1 cm. Its surface has 150 dimples each of radius 2 mm. Calculate totals area which is exposed to the surrounding assuming that the dimples are hemispherical.

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107. A tent of height 77dm is in the form of a right circular cylinder of diameter 36m and height 44dm surmounted by a

right circular cone. Find the cost of the canvas at Rs. 3.50 per

$$m^2igg(Use\pi=rac{22}{7}igg)$$

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108. A cylindrical tub if radius 5cm and length 9.8cm is full of water .A splid in the form of a right circular cone mounted on a hemisphere is immersed into the tub.If the radius of the hemisphere is 3.5cm and the total height of the solid ids 8.5cm ,find the volume of water left in the tub

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

find the area of the canvas used for making the tent. Also find the rate of the canvas with 500 per m^2

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



111. A right triangle, whose sides are 3 cm and 4 cm (other than hypotenuse) is made to revolve about its hypotenuse. Find the

volume and surface area of the double cone so formed.

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112. A cone made of paper has height 3h and vertical angle 2α . It contains two other cones of height 2h and h and vertical angle 4α and 6α . Find the ratio of the two volume in the cones.

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113. A cylinder vessel of diameter 14cm and height 42cm is fixed symmetrically inside a similar vessel of diameter 16cm and height 42cm. The total space between the two vessels is filled with cork dust for heat insulation purposes. How many cubic centimetres of cork dust will be required?



114. The difference between outside and inside surface areas of cylindrical metallic pipe 14cm long is $44cm^2$. If the pipe is made of $99cm^3$ of metal, find the outer and inner radii of the pipe

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115. A solid iron rectangular block of dimensions 4.4 m , 2.6 m and 1 m is cast into a hollow cylindrical pipe of internal radius 30 cm and thickness 5 cm.Find the length of the pipe.

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116. Sushant has a vessel of the form of an inverted cone, open at the top, of height 11 cm and radius of the top as 2.5 cm and is full of water. Metallic spherical balls each of diameter 0.5 cm are put in the vessel due to which two - fifths of the water in the vessel flows out Find how many balls were put in the vessel. Sushant made the arrangement so that the water that flows out irrigates the flower beds. What value has been shown by Sushant ?

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117. A vessel in the shape of a cuboid contains some water. If three indentical spheres are immersed in the water, the level of water is increased by 2cm. If the area of the base of the cuboid is 160 cm^2 and its height 12cm, determine the radius of any of the spheres.

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118. Prove that the surface area of a sphere is equal to the curved

surface area of the circumscribed cylinder.



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120. A right circular cylinder having diameter 12cm and height 15cm is full of ice-cream. The ice-cream is to be filled in cones of height 12cm and diameter 6cm having a hemispherical shape on the top. Find the number of such cones which can be filled with ice-cream.

121. A circus tent is cylindrical upto a height of 3m and conical above it. If the diameter of the base is 105m and the slant height of the conical part is 53m, find the total canvas used in making the tent.

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122. Water is flowing at the rate of 2.52 km/h through a cylindrical pipe into a cylindrical tank, the radius of the base is 40cm. If the increase in the level of water in the tank, in half an hour is 3.15m, find the internal diameter of the pipe.



123. The solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 108cm and the diameter of the hemispherical ends is 36cm, find the cost of polishing the surface of the solid at the rate of 7 paise per sq. cm $\left(Use\pi = \frac{22}{7}\right)$



124. A solid is in the form of a right circular cone mounted on a hemisphere. The radius of the hemisphere is 3.5cm and the height of the cone is 4cm. The solid is placed in a cylindrical tub, full of water, in such a way that the whole solid is submerged in water. If the radius of the cylinder is 5cm and its height is 10.5cm, find the volume of water left in the cylindrical tub. $\left(Use\pi = \frac{22}{7}\right)$

125. Three cubes each of side 5 cm are joined end to end. Find

the surface area of the resulting cuboid.

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126. Two cubes each of volume $64 \ cm^3$ are joined end to end.

Find the surface area and volume of the resulting cuboid.



127. A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6 cm. Find the height of the cylinder. **128.** Metallic spheres of radii 6 cm, 8 cm and 10 cm respectively, are melted to form a single solid sphere. Find the radius of the resulting sphere.

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129. How many spherical bullets can be made out of a solid cube of lead whose edge measures 44 cm, each being 4 cm in diameter.

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130. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. 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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131. A right circular cone is 3.6 cm high and 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.



132. A conical vessel whose internal radius is 5 cm and height 24 cm is full of water. The water is emptied into a cylindrical vessel with internal radius 10 cms. Find the height to which the water rises.

133. The dimensions of a metallic cuboid are: $100 \ cm \times 80 \ cm \times 64 \ cm$. It is melted and recast into a cube. Find the surface area of the cube.

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134. Find the number of coins, 1.5 cm in diameter and 0.2 cm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.

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135. A glass cylinder with diameter 20 cm has water to a height of 9 cm. A metal cube of 8 cm edge is immersed in it completely.



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136. 2.2 cubic dm of brass is to be drawn into a cylindrical wire 0.50 cm in diameter. Find the length of the wire.

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



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



139. A well, whose diameter is 7m, has been dug 22.5 m deep and the earth dugout is used to form an embankment around it. If the height of the embankment is 1.5 m, find the width of the embankment.



140. Water is being pumped out through a circular pipe whose internal diameter is 7 cm. If the flow of water is 72 cm per

second, how many litres of water are being pumped out in one

hour?



141. water is flowing at the rate of 2.52 km/h through a cylindrical pipe into a cylindrical tank, the radius of whose base is 40 cm, If the increase in the level of water in the tank, in half an hour is 3.15 m, find the internal diameter of th pipe.



142. Water is flowing at the rate of 5 km/hour through a pipe of diameter 14 cm into a rectangular tank, which is 50 m long and 44 m wide. Determine the time in which the level of water the tank will rise by 7 cm.



143. The rain water from a roof of $22 \ m \times 20 \ m$ drains into a cylindrical vessel having diameter of base 2 m and height 3.5 m. If the vessel is just full, find the rain fall in cm.



144. Water in a canal, $30 \ dm \ wide \ and \ 12 \ dm \ deep$, is flowing with a velocity of $20 \ km \ per \ hour$. How many area will it irrigate in $30 \ m \in$, if $9 \ cm$ of standing water is desired?



145. A hemispherical tank of radius 1.75 m is full of water. It is connected with a pipe which empties it at the rate of 7 litres per

second. How much time will it take to empty the tank completely?

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146. 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 pin is used up on writing 3300 words on an average. How many words can be written in a bottle of ink containing one-fifth of a litre?



147. The cost of painting the total outside surface of a closed cylindrical oil tank at 60 paise per sq. dm is Rs. 237.60. The height of the tank is 6 times the radius of the base of the tank. Find its volume correct to two decimal places.



148. A copper wire, 3 mm in diameter, is wound about a cylinder whose length is 12 cm, and diameter 10 cm, so as to cover the curved surface of the cylinder. Find the length and mass of the wire, assuming the density of copper to be `8. 88g"\ "p e r"\



149. A copper wire, 3 mm in diameter, is wound about a cylinder whose length is 12 cm, and diameter 10 cm, so as to cover the curved surface of the cylinder. Find the length and mass of the wire, assuming the density of copper to be `8. 88g"\ "p e r"\



150. The radii of the internal and external surfaces of a metallic spherical shell are 3 cm and 5 cm respectively. It is melted and recast into a solid right circular cylinder of height $10\frac{2}{3}$ cm. Find the diameter of the base of the cylinder.

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151. The largest sphere is carved out of a cube of a side 7 cm.

Find the volume of the sphere.

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152. Determine the ratio of the volume of a cube to that of a

sphere which will exactly fit inside the cube.



153. The radius of a solid iron sphere is 8 cm. Eight rings of iron plate of external radius $6\frac{2}{3}$ cm and thickness 3 cm are made by melting this sphere. Find the internal diameter of each ring.

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154. The radii of the bases of two right circular solid cones of same height are r_1 and r_2 respectively. The cones are melted and recast into a solid sphere of radius R. Show that the height of each cone is given by $h = \frac{4R^3}{r12 + r22}$

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155. Selvis house has an overhead tank in the shape of a cylinder.

This is filled by pumping water from a sump (an underground

tank) which is in the shape of a cuboid. The sump has dimensions 1. $57m \times 1.44m \times 95cm$. The overhead tank has its radius of 60cm and its height is 95cm. Find the height of the water, left in the sump after the overhead tank has been completely filled with water from a sump which had been full. Compare the capacity of the tank with that of the sump (Use π =22/7)



156. A hemispherical tank full of water is emptied by a pipe at the rate of $3\frac{4}{7}$ litres per second. How much time will it take to make the tank half-empty, if the tank is 3 m in diameter?

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157. How many balls, each of radius 1 cm, can be made from a

solid sphere of lead of radius 8 cm?



158. How many spherical bullets each of 5 cm in diameter can be cast from a rectangular block of metal 11~dm imes 1~m imes 5~dm ?

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159. A spherical ball of radius 3 cm is melted and recast into three spherical balls. The radii of the two of the balls are 1.5 cm and 2 cm respectively. Determine the diameter of the third ball.



160. 2.2 cubic dm of brass is to be drawn into a cylindrical wire

0.25 cm in diameter. Find the length of the wire.



161. What length of a solid cylinder 2 cm in diameter must be taken to recast into a hollow cylinder of length 16 cm, external diameter 20 cm and thickness 2.5 mm?



162. A cylindrical vessel having diameter equal to its height is full of water which is poured into two identical cylindrical vessels with diameter 42 cm and height 21 cm which are filled completely. Find the diameter of the cylindrical vessel. **163.** 50 circular plates each of diameter 14 cm and thickness 0.5 cm are placed one above the other to form a right circular cylinder. Find its total surface area.

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164. 25 circular plates, each of radius 10.5 cm and thickness 1.6 cm, are placed one above the other to form a solid circular cylinder. Find the curved surface area and the volume of the cylinder so formed.

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165. A path 2 m wide surrounds a circular pond of diameter 40 m.

How many cubic metres of gravel are required to grave the path

to a depth of 20 cm?



166. A 16 m deep well with diameter 3.5 m is dug up and the earth from it is spread evenly to form a platform 27.5 m by 7 m. Find the height of the platform.

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167. A well of diameter 2 m is dug 14 m deep. The earth taken out of it is spread evenly all around it to form an embankment of height 40 cm. Find the width of the embankment. **168.** Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 9cm.

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



170. Rain water, which falls on a flat rectangular surface of length 6 m and breadth 4 m is transferred into a cylindrical vessel of internal radius 20 cm. What will be the height of water in the cylindrical vessel if a rainfall of 1 cm has fallen? (a) 188 cm (b) 189 cm (c) 190 cm (d) 191 cm



171. A conical flask is full of water. The flask has base-radius r and height h. The water is poured into a cylindrical flask of base-radius mr. Find the height of water in the cylindrical flask.



172. A rectangular tank 15 m long and 11 m broad is required to receive entire liquid contents from a full cylindrical tank of internal diameter 21 m and length 5 m. Find the least height of the tank that will serve the purpose.



173. 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?



174. The diameters of the internal and external surfaces of a hollow spherical shell are 6 cm and 10 cm respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, find the height of the cylinder.



175. A hollow sphere of internal and external diameters 4 cm and

8 cm respectively is melted into a cone of base diameter 8 cm.

Calculate the height of the cone.



176. 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.



177. 500 persons have to dip in a rectangular tank which is 80 m long and 50 m broad. What is the rise in the level of water in the tank, if the average displacement of water by a person is $0.04 m^3$?



178. A cylindrical jar of radius 6 cm contains oil. Iron spheres each of radius 1.5 cm are immersed in the oil. How many spheres are necessary to raise the level of the oil by two centimetres?



179. A hollow sphere of internal and external radii 2 cm and 4 cm respectively is melted into a cone of base radius 4 cm. Find the height and slant height of the cone.


180. The internal and external diameters of a hollow hemispherical vessel are 21 cm and 25.2 cm respectively. The cost of painting $1 \text{ } cm^2$ of the surface is 10 paise. Find the total cost to paint the vessel all over.

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181. Raise in water level problems : A cylinderical tub of radius 12 cm contains water to a depth of 20cm. A spherical form ball of a radius 9 cm is dropped into the tub and thus the level of water is raised by H cm. What is the value of H?



182. A spherical ball of radius 3 cm is melted and recast into three spherical balls. The radii of two of the balls are 1.5 cm and

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184. An iron spherical ball has been melted and recast into smaller balls of equal size. If the radius of each of the smaller balls is 1/4 of the radius of the original ball, how many such balls are made? Compare the surface area, of all the smaller balls combined together with that of the original ball.



185. A tent of height 77 dm is in the form a right circular cylinder of diameter 36 m and height 44 dm surmounted by a right circular cone. Find the cost of the canvas at Rs 3. $50 \ per \ m^2$.

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186. Metal spheres, each of radius 2 cm, are packed into a rectangular box of internal dimension $16 \ cm \times 8 \ cm \times 8 \ cm$ when 16 spheres are packed the box is filled with preservative liquid. Find the volume of this liquid.



187. The largest sphere is to be curved out of a right circular cylinder of radius 7 cm and height 14 cm. Find the volume of the



188. A copper sphere of radius 3 cm is melted and recast into a right circular cone of height 3 cm. Find the radius of the base of the cone.

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189. 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.



190. The diameters of the internal and external surfaces of a hollow spherical shell are 6 cm and 10 cm respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, find the height of the cylinder.

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191. A right angled triangle whose sides are 3 cm, 4 cm and 5 cm is revolved about the sides containing the right angle in two ways. Find the difference in volumes of the two cones so formed. Also, find their curved surfaces.



192. How many coins 1.75 cm in diameter and 2 mm thick must be

melted to form a cuboid $11\,cm imes 10\,cm imes 7\,cm$?



193. A well with inner diameter 8 m is dug 14 m deep. Earth taken out of its has been evenly spread all around it to a width of 3 m to form an embankment. The height of the embankment will be 4^{26} m (b) 5 26 cm (c) 6 26 cm (d) 7 26 cm

 $4\frac{26}{33}m$ (b) $5\frac{26}{33}cm$ (c) $6\frac{26}{33}cm$ (d) $7\frac{26}{33}cm$

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194. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a

speed of 10 km/h. How much area will it irrigate in 30 minutes, if

8 cm of standing water is needed?



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

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196. A well of diameter 3 m is dug 14 m deep. The earth taken out of it has been spread evenly all around it to a width of 4 m to form an embankment. Find the height of the embankment.



197. The surface area of a solid metallic sphere is $616\ cm^2$. It is melted and recast into a cone of height 28 cm. Find the diameter of the base of the cone so formed (Use $\pi=22/7$)

198. The difference between the outer and inner curved surface areas of a hollow right circular cylinder 14 cm long is $88~cm^2$. If the volume of metal used in making the cylinder is $176~cm^3$, find the outer and inner diameters of the cylinder. (Use $\pi = 22/7$)



199. The volume of a hemi-sphere is $2425 \frac{1}{2} \ cm^3$. Find its curved

surface area. (Use $\pi=22\,/\,7$)



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

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201. If the total surface arecl of a solid hemisphere is $462cm^2$ find its volume

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202. 150 spherical marbles, each of diameter 1.4 cm are dropped in a cylindrical vessel of diameter 7 cm containing some water, which are completely immersed in water. Find the rise in the level of water in the vessel.



203. A cylindrical tank full of water is emptied by a pipe at the rate of 225 litres per minute. How much time will it take to empty half the tank, if the diameter of its base is 3 m and its height is 3.5 m? [Use $\pi = 22/7$]



204. A solid metallic sphere of radius 5.6 cm is melted and solid

cones each of radius 2.8 cm and height 3.2 cm are made. Find the

number of such cones formed.



205. A 5 m wide cloth is used to make a conical tent of base diameter 14 m and height 24. Find the cost of cloth used at the rate of Rs 25 per metre. [Use $\pi=22/7$]



206. An iron pillar has some part in the form of a right circular cylinder and remaining in the form of a right circular cone. The radius of the base of each of cone and cylinder is 8 cm. The cylindrical part is 240 cm high and the conical part is 36 cm high. Find the weight of the pillar if one cubic cm of iron weighs 7.8 grams.



207. The interior of a building is in the form of a right circular cylinder of diameter 4.2 m and height 4 m and height 4 m surmounted by a cone of same diameter. The hright of the cone is 2.8 m. Find the outer surface area of the building.

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208. The interior of a building is in the form of cylinder of diameter 4.3 m and height 3.8 m, surmounted by a cone whose vertical angle is a right angle. Find the area of the surface and the volume of the building. (Take $\pi = 3.14$)



209. A tent is of the shape of a right circular cylinder upto a height of 3 metres and then becomes a right circular cone with a

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.



210. 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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211. A cylindrical container of radius 6 cm and height 15 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.



212. A solid is in the form of a cylinder with hemispherical ends. The total height of the solid is 19 cm and the diameter of the cylinder is 7 cm. Find the volume and total surface area of the solid (Use $\pi = 22/7$)



213. A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter of the sphere is 14 cm and the total height of the vessel is 13 cm. Find its capacity. (Take $\pi = 22/7$)



214. A solid toy is in the form of a right circular cylinder with a hemispherical shape at one end and a cone at the other end. Their common diameter is 4.2 cm. and the height of the cylindrical and conical portions are 12 cm and 7 cm respectively. Find the volume of the solid toy. (Use $\pi = 22/7$)

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215. A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 2 cm and the diameter of the base is 4 cm. If a right circular cylinder circumscribes the solid. Find how much more space it will cover.



216. From a solid circular cylinder with height 10 cm and radius of the base 6 cm, a circular cone of the same height and same base is removed. Find the volume of remaining solid and also find the whole surface area.

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217. A wooden toy rocket is in the shape of a cone mounted on a cylinder as shown in Figure. The height of the entire rocket is 26 cm, while the height of the conical part is 6 cm. The base of the conical portion has a diameter of 5 cm, while the base diameter of the cylindrical portion is 3 cm. If the conical portion is to be painted orange and the cylindrical portion yellow, find the area of the rocket painted with each of these colours. (Take $\pi = 3.14$

)

218. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in Fig. . If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the total surface area of the article.



219. Mayank made a bird-bath for his garden in the shape of a cylinder with a hemispherical depression at one end. The height of the cylinder is 1.45 m and its radius is 30 cm. Find the total surface area of the bird-bath.



220. A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m, and slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of canvas of the tent at the rate of Rs $500 \ per \ m^2$.



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221. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2 .



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

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223. Rachel, an engineering student, was asked to make a model shaped like a cylinder with two cones attached at its two ends by using a thin aluminium sheet. The diameter of the model is 3 cm and its length is 12 cm. If each cone has a height of 2 cm



224. A gulabjamun when completely ready for eating contains sugar syrup up to about 30% of its volume. Find approximately

how much syrup would be found in 45 gulabjamuns shaped like a cylinder with two hemispherical ends, if the complete length of each of the gulabjamun is 5 cm and its diameter is 2.8 cm.



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

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226. A vessel in the form of inverted cone. Its height is 8 cm and radius of its top, which is open, is 5 cm. It is filled with water upto the brim. When lead shots, each of which is a sphere of

radius 0.5 cm are dropped in the vessel, one fourth of the water flows out. Find the number of lead shots dropped in the vessel.

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227. A solid consisting of a right standing on a hemisphere is placed upright in a right circular cylinder full of water and touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm, the radius of the hemisphere is 60 cm and height of the cone is 120 cm, assuming that the hemisphere and the cone have common base.



228. A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the pole, given that $1 \ cm^3$ of iron has approximately $8 \ g \ mass$ (Use $\pi = 3.14$)

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229. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter: the diameter of the spherical part is 8.5 cm. By measuring the amount of water it holds, a child finds its volume to be $345 \ cm^3$. Check whether she is correct, taking the above as the inside measurements and $\pi = 3.16$.

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230. Rasheed got a playing top (lattu) as his birthday present, which surprisingly had no colour on it. He wanted to colour it with his crayons. The top is shaped like a cone surmounted by a hemisphere. The entire top is 5 cm in height and the diameter of the top is 3.5cm. Find the area he has to colour. (Take π =22/7)



231. A decorative block shown in Figure is made of two solids a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter 4.2 cm. Find the total surface area of the block (Take $\pi = 22/7$).



232. A cubical block of side 7 cm is surmounted by a hemisphere.

What is the greatest diameter of the hemisphere can have? Find

the total surface area of the solid.



233. A hemispherical depression is cut-out from one face of the cubical wooden block such that the diameter l of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.



234. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends as shown in Fig. The

length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.

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235. Shanta runs an industry in a shed which is in the shape of a cuboid surmounted by a half cylinder. If the base of the shed is of dimension 7mx15m, and the height of the cuboidal portion is 8 m, find the volume of the air that the shed can hold. If the industry requires machinery which would occupy a total space of $300m^3$, and there are 20 workers each of whom would occupy $0.08m^3$ space on an average, how much air would be in the shed when it is working. (Take $\pi = \frac{22}{7}$)

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236. A juice seller was serving his customers using glasses. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm,find what the apparent capacity of the glass was and what the actual capacity was



237. A container shaped like a right circular cylinder having diameter 12 cm and height 15 cm is full of ice-cream. The ice-cream is to be filled into cones of height 12 cm and diameter 6 cm, having a hemispherical shape on the top. Find the number of such cones which can be filled with ice-cream.

238. A cistern, internally measuring $150 \ cm \times 120 \ cm \times 110 \ cm$ has $129600 \ cm^3$ of water in it. Porous bricks are placed in the water until the cistern is full to the brim. Each brick absorbs one seventeenth of its own volume of water. How many bricks can be put in without the water overflowing, each brick being $22.5 \ cm \times 7.5 \ cm \times 6.5 \ cm$?



239. A tent is in the form of a right circular cylinder surmounted by a cone. The diameter of 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 canvas required for the tent.



240. 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 2.5 m and height 21 m and the cone has the slant height 8 m. Calculate the total surface area and the volume of the rocket.

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241. A toy is in the form of a cone surmounted on a hemisphere. The diameter of the base and the height of the cone are 6 cm and 4 cm, respectively. Determine the surface area of the toy. (Use $\pi = 3.14$)



242. A solid is in the form of a right circular cylinder, with a hemisphere at one end and a cone at the other end. The radius of the common base is 3.5 cm and the heights of the cylindrical and conical portions are 10 cm and 6 cm, respectively. Find the total surface area of the solid. (Use $\pi = 22/7$)



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

244. A circus tent has cylindrical shape surmounted by a conical roof. The radius of the cylindrical base is 20 m. The heights of the cylindrical and conical portions are 4.2 m and 2.1 m respectively. Find the volume of the tent.

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245. A petrol tank is a cylinder of base diameter 21 cm and length18 cm fitted with conical ends each of axis length 9 cm.Determine the capacity of the tank.



246. A conical hole is drilled in a circular cylinder of height 12 cm and base radius 5 cm. The height and the base radius of the

cone are also the same. Find the whole surface and volume of the remaining cylinder.

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247. A boiler is in the form of a cylinder 2 m long with hemispherical ends each of 2 metre diameter. Find the volume of the boiler.



248. A vessel is a hollow cylinder fitted with a hemispherical bottom of the same base. The depth of the cylinder is $\frac{14}{3}$ m and the diameter of hemisphere is 3.5 m. Calculate the volume and the internal surface area of the solid.

249. A solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 104 cm and the radius of each of the hemispherical ends is 7 cm, find the cost of polishing its surface at the rate of Rs $10 \ per \ dm^2$



250. A cylindrical road roller made of iron is 1 m long. Its internal diameter is 54 cm and the thickness of the iron sheet used in making the roller is 9 cm. Find the mass of the roller, if $1 cm^3$ of iron has 8 gm mass. (Use $\pi = 3.14$)



251. A vessel 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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252. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.



253. A right circular cylinder having diameter 12 cm and height 15 cm is full of ice-cream. The ice-cream is to be filled in cones of height 12 cm and diameter 6 cm having a hemispherical shape

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



254. A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 2 cm and the diameter of the base is 4 cm. If a right circular cylinder circumscribes the toy, find how much more space it will cover.



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

180 cm.



256. A cylindrical vessel with internal diameter 10 cm and height 10.5 cm is full of water. A solid cone of base diameter 7 cm and height 6 cm is completely immersed in water. Find the volume of water (i) displaced out of the cylinder (ii) left in the cylinder. (Take $\pi = 22/7$)

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257. A hemispherical depression is cut out from one face of a cubical wooden block of edge 21 cm, such that the diameter of

the hemisphere is equal to the edge of the cube. Determine the

volume and total surface area of the remaining block.



258. A solid is in the shape of a cone surmounted on a hemisphere, the radius of each of them is being 3.5 cm and the total height of solid is 9.5 cm. Find the volume of the solid. (Use $\pi = 22/7$)



259. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder. If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the total surface area of the article.


260. From a solid cylinder of height 2.8 cm and diameter 4.2 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid. (Take $\pi=22/7$)



261. A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is $166\frac{5}{6}cm^3$. Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of Rs. 10 per cm^2

262. The slant height of the frustum of a cone is 4 cm, and the perimeter of its circular bases are 18 cm and 6 cm respectively. Find the curved surface area of the frustum.

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263. A bucket is in the form of a frustum of a cone and holds 28.490 litres of water. The radii of the top and bottom are 28 cm and 21 cm respectively. Find the height of the bucket. (a) 15 cm (b) 20 cm (c) 25 cm (d) 30 cm



264. A friction clutch is in the form of a frustum of a cone, the diameter of the ends being 32 cm and 20 cm and length 8 cm.

Find its bearing surface and volume.



265. The height of a cone is 30 cm .A small cone is cut off at the top by a plane parallel to the base . If its volume be $\frac{1}{27}$ of the volume of the given cone, at what height above the base the section has been made?



266. An oil funnel of tin sheet consists of a cylindrical portion 10 cm long attached to a frustum of a cone. If the total height be 22 cm, diameter of the cylindrical portion be 8 cm and the diameter of the top of the funnel be 18 cm, find the area of the tin required to make the funnel.



267. A solid metallic right circular cone 20 cm high with vertical angle 60o is cut into two parts at the middle point of its height by a plane parallel to the base. If the frustum, so obtained, be drawn into a wire of diameter $\frac{1}{16}$ cm , find the length of the wire.

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268. A bucket of height 8 cm and made up of copper sheet is in the form of frustum of a right circular cone with radii of its lower and upper ends as 3 cm and 9 cm respectively. (i) Calculate the height of the cone of which the bucket is a part. (ii) The volume of water which can be filled in the bucket. (iii) The area of copper sheet required to make the bucket. **269.** An open metal bucket is in the shape of a frustum of a cone, mounted on a hollow cylindrical base made of the same metallic sheet. The diameters of the two circular ends of the bucket are 45 cm and 25 cm, the total vertical height of the bucket is 40cm and that of the cylindrical base is 6cm. Find the area of the metallic sheet used to make the bucket, where we do not take into account the handle of the bucket. Also, find the volume of water the bucket can hold. (Take π =22/7)

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270. Hanumappa and his wife Gangavva are busy making Jaggery out of sugar-cane. They have processed the sugarcane juice to make the molasses which is poured into moulds of the shape

shown in Figure. It will be cooled to solidify in this shape to be sent to the market. Each mould is in the shape of a frustum of a cone having the diameters of its two circular ends as 30 cm and 35 cm and the height of the mould is 14 cm. If each cm^3 of molasses weighs about 1.2 gm, find the weight of molasses that can be poured into each mould (Take $\pi = 22/7$)



271. A fez, the headgear cap used by the trucks is shaped like the frustum of a cone. If its radius on the open side is 10 cm, radius at the upper base is 4 cm and its slant height is 15 cm, find the area of material used for making it.

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272. A bucket has top and bottom diameters of 40 cm and 20 cm respectively. Find the volume of the bucket if its depth is 12 cm. Also, find the cost of tin sheet used for making the bucket at the rate of Rs 1. $20 \ per \ cm^2$.

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273. A frustum of a right circular cone has a diameter of base 20 cm, of top 12 cm, and height 3 cm. Find the area of its whole surface and volume.



274. The slant height of the frustum of a cone is 4 cm and the perimeters of its circular ends are 18 cm and 6 cm. Find the curved surface of the frustum.



275. The perimeters of the ends of a frustum of a right circular cone are 44 cm and 33 cm. If the height of the frustum be 16 cm, find its volume, the slant surface and the total surface.



276. If the radii of the circular ends of a conical bucket which is 45 cm high be 28 cm and 7 cm, find the capacity of the bucket. (Use $\pi=22/7$)



277. The height of a cone is 20 cm. A small cone is cut off from the top by a plane parallel to the base. If its volume be 1/125 of the volume of the original cone, determine at what height above the base the section is made.

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278. If the radii of the circular ends of a bucket 24 cm high are 5

cm and 15 cm respectively, find the surface area of the bucket.

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279. The radii of the circular bases of a frustum of a right circular cone are 12 cm and 3 cm and the height is 12 cm. Find the total surface area and the volume of the frustum.



280. A tent consists of a frustum of a cone capped by a cone. If the radii of the ends of the frustum be 13 m and 7 m, the height of the frustum be 8 m and the slant height of the conical cap be 12 m, find the canvas required for the tent.



281. A reservoir in the form of the frustum of a right circular cone contains 44×10^7 litres of water which fills it completely. The radii of the bottom and top of the reservoir are 50 metres and 100 metres respectively. Find the depth of water and the lateral surface area of the reservoir. (Take $\pi = 22/7$)



282. A solid metallic right circular cone 20 cm high with vertical angle 60o is cut into two parts at the middle point of its height by a plane parallel to the base. If the frustum, so obtained, be drawn into a wire of diameter $\frac{1}{16}$ cm , find the length of the wire.



283. A bucket is in form of a frustum of a cone with a capacity of $12308.8cm^3$ of water. The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket and the area of the metal sheet used in its making. [Use $\pi = 3.14$.]



284. A bucket made of aluminium sheet is of height 20 cm and its upper and lower ends are of radius 25 cm and 10 cm respectively. Find the cost of making the bucket if the aluminium sheet costs Rs 70 per $100 \ cm^2$. (Use $\pi = 3.14$)

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285. The radii of the circular ends of a solid frustum of a cone are 33 cm and 27 cm and its slant height is 10 cm. Find its total surface area.



286. A bucket made up of a metal sheet is in the form of a frustum of a cone of height 16 cm with diameters of its lower and upper ends as 16 cm and 40 cm respectively. Find the volume

of the bucket. Also, find the cost of the bucket if the cost of metal sheet used is Rs 20 per $100~cm^2$. (Use $\pi=3.~14$)

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287. A solid is in the shape of a frustum of a cone. The diameters of the two circular ends are 60 cm and 36 cm and the height is 9 cm. Find the area of its whole surface and the volume.



288. A milk container is made of metal sheet in the shape of frustum of a cone whose volume is $10459\frac{3}{7}cm^2$. The radii of its lower and upper circular ends are 8 cm and 20 cm respectively. Find the cost of metal sheet used in making the container at the rate of Rs. 1.40 per square centimeter.



289. A solid cone of base radius 10 cm is cut into two parts through the mid-point of its height, by a plane parallel to its base. Find the ratio in the volumes of two parts of the cone.



290. A bucket open at the top, and made up of a metal sheet is in the form of a frustum of a cone. The depth of the bucket is 24 cm and the diameters of its upper and lower circular ends are 30 cm and 10 cm respectively. Find the cost of metal sheet used in it at the rate of Rs 10 per 100 cm^2 .



291. In Figure, from the top of a solid cone of height 12 cm and base radius 6 cm, a cone of height 4 cm is removed by a plane parallel to the base. Find the total surface area of the remaining solid. (Use $\pi = 22/7$ and $\sqrt{5} = 2.236$)

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292. A metallic sphere 1 dm in diameter is beaten into a circular sheet of uniform thickness equal to 1 mm. Find the radius of the sheet.



293. Three solid spheres of radii 3, 4 and 5 cm respectively are melted and converted into a single solid sphere. Find the radius of this sphere.

294. A spherical shell of lead, whose external diameter is 18 cm, is melted and recast into a right circular cylinder, whose height is 8 cm and diameter 12 cm. Determine the internal diameter of the shell.



295. A well with 10m inside diameter is dug 8.4m deep. Earth taken out of it is spread all around it to a width of 7.5m to form an embankment. Find the height of the embankment.



296. In the middle of a rectangular field measuring $30m \times 20m$, a well of 7 m diameter and 10 m depth is dug. The earth so removed is evenly spread over the remaining part of the field. Find the height through which the level of the field is raised.

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297. The inner and outer radii of a hollow cylinder are 15 cm and 20 cm, respectively. The cylinder is melted and recast into a solid cylinder of the same height. Find the radius of the base of new cylinder.



298. Two cylindrical vessels are filled with oil. Their radii are 15 cm, 12 cm and heights 20 cm, 16 cm respectively. Find the radius

of a cylindrical vessel 21 cm in height, which will just contain the

oil of the two given vessels.



299. A cylindrical bucket 28 cm in diameter and 72 cm high is full of water. The water is emptied into a rectangular tank 66 cm long and 28 cm wide. Find the height of the water level in the tank.



300. A cubic cm of gold is drawn into a wire 0.1 mm in diameter,

find the length of the wire.



301. A well of diameter 3 m is dug 14 m deep. The earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 4 m to form an embankment. Find the height of the embankment.

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302. A conical vessel whose internal radius is 10 cm and height 48 cm is full of water. Find the volume of water. If this water is poured into a cylindrical vessel with internal radius 20 cm, find the height to which the water level rises in it.



303. The vertical height of a conical tent is 42 dm and the diameter of its base is 5.4 m. Find the number of persons it can

accommodate if each person is to be allowed 29.16 cubic dm.



304. 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 the height of each as 3:4.

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305. A sphere of diameter 5 cm is dropped into a cylindrical vessel partly filled with water. The diameter of the base of the vessel is 10 cm. If the sphere is completely submerged, by how much will the level of water rise?

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306. A spherical ball of iron has been melted and made into smaller balls. If the radius of each smaller ball is one-fourth of the radius of the original one, how many such balls can be made?

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307. Find the depth of a cylindrical tank of radius 28 m, if its capacity is equal to that of a rectangular tank of size 28m imes 16m imes 11m.

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308. A hemispherical bowl of internal radius 15 cm contains a liquid. The liquid is to be filled into cylindrical-shaped bottles of

diameter 5 cm and height 6 cm. How many bottles are necessary

to empty the bowl?

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309. In a cylindrical vessel of diameter 24 cm, filled up with sufficient quantity of water, a solid spherical ball of radius 6 cm is completely immersed. Find the increase in height of water level.

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310. A hemisphere of lead of radius 7 cm is cast into a right circular cone of height 49cm. Find the radius of the base.



311. A solid metallic sphere of diameter 28 cm is melted and recast into a number of smaller cones, each of diameter $4\frac{2}{3}$ cm and height 3 cm. Find the number of cones so formed.



312. The diameter of a copper sphere is 18 cm. The sphere is melted and is drawn into a long wire of uniform circular cross-section. If the length of the wire is 108 m, find its diameter.



313. A hemisphere of lead of radius 7 cm is cast into a right

circular cone of height 49cm. Find the radius of the base.



314. A metallic sphere of radius 10.5 cm is melted and recast into small right circular cones, each of base radius 3.5 cm and height 3 cm. The number of cones so formed is (a) 105 (b) 113 (c) 126 (d) 135

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315. A cone, a hemisphere and a cylinder stand on equal bases and have the same height. Show that their volumes are in the ratio 1:2:3.



316. A metallic spherical shell of internal and external diameters 4 cm and 8 cm respectively is melted and recast into the form a cone of base diameter 8 cm. Find the height of the cone.





319. A solid sphere of radius 'r' is melted and recast into a hollow cylinder of uniform thickness. If the external radius of the

base of the cylinder is 4 cm, its height 24 cm and thickness 2 cm, find the value of 'r'.

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320. Lead spheres of diameter 6 cm are dropped into a cylindrical beaker containing some water and are fully submerged. If the diameter of the beaker is 18 cm and water rises by 40 cm. Find the number of lead spheres dropped in the water.

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321. The height of a solid cylinder is 15 cm and the diameter of its base is 7 cm. Two equal conical holes each of radius 3 cm and height 4 cm are cut off. Find the volume of the remaining solid.



322. The solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 108cm and the diameter of the hemispherical ends is 36cm, find the cost of polishing the surface of the solid at the rate of 7 paise per sq. cm $\left(Use\pi = \frac{22}{7}\right)$

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323. The surface area of a sphere is the same as the curved surface area of a cone having the radius of the base as 120 cm and height 160 cm. Find the radius of the sphere.

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324. 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 the height of each as 3:4.

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325. A rectangular vessel of dimensions $20cm \times 16cm \times 11cm$. is full of water. This water is poured into a conical vessel. The top of the conical vessel has its radius 10 cm. If the conical vessel is filled completely, determine its height. [Use $\pi = 22/7$]

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326. If r_1 and r_2 be the radii of two solid metallic spheres and if they are melted into one solid sphere, prove that the radius of the new sphere is $\left(r1^3+r2^3\right)^{1/3}$



327. A solid metal sphere of 6 cm diameter is melted and a circular sheet of thickness 1 cm is prepared. Determine the diameter of the sheet.



328. A hemispherical tank full of water is emptied by a pipe at the rate of $\frac{25}{7}$ litres per second. How much time will it take to empty half the tank, if it is 3m in diameter?



329. Find the number of coins 1.5 cm in diameter and 0.2 cm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm. (a) 430 (b) 440 (c) 450 (d) 460



330. An iron pillar consists of a cylindrical portion of 2.8m. height and 20cm. in diameter cone of 42cm. height surmounting it. Find the weight of the pillar if $1cm^3$ of iron weights 7.5g.

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331. A circus tent is cylindrical to a height of 3 metres and conical above it. If its diameter is 105m and the slant height of the conical portion is 53m, calculate the length of the canvas 5m wide to make the required tent.

332. Height of a solid cylinder is 10 cm and diameter 8 cm. Two equal conical hole have been made from its both ends. If the diameter of the holes is 6 cm and height 4 cm, find (i) volume of the cylinder, (ii) volume of one conical hole, (iii) volume of the remaining solid.

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333. The height of a solid cylinder is 15 cm. and the diameter of its base is 7 cm. Two equal conical holes each of radius 3 cm, and height 4 cm are cut off. Find the volume of the remaining solid.

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334. The solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 108cm and the diameter of the hemispherical ends is 36cm, find the cost of polishing the surface of the solid at the rate of 7 paise per sq. cm $\left(Use\pi = \frac{22}{7}\right)$

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335. The largest sphere is to be curved out of a right circular cylinder of radius 7 cm and height 14 cm. Find the volume of the sphere.



336. A tent is in the form of a right circular cylinder surmounted by a cone. The diameter of cylinder is 24m. The height of the

cylindrical portion is 11m while the vertex of the cone is 16m above the ground. Find the area of the canvas required for the tent.



337. 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 total surface area and volume of the toy.



338. A cylindrical container is filled with ice-cream, whose diameter is 12 cm and height is 15 cm. The whole ice-cream is distributed to 10 children in equal cones having hemispherical

tops. If the height of the conical portion is twice the diameter of

its base, find the diameter of the ice-cream.



339. Find the volume of a solid in the form of a right circular cylinder with hemi-spherical ends whose total length is 2.7 m and the diameter of each hemi-spherical end is 0.7 m.



340. A tent of height 8.25 m is in the form of a right circular cylinder with diameter of base 30 m and height 5.5 m, surmounted by a right circular cone of the same base. Find the cost of the canvas of the tent at the rate of Rs $45 \ per \ m^2$.

341. An iron pole consisting of a cylindrical portion 110 cm high and of base diameter 12 cm is surmounted by a cone 9 cm high. Find the mass of the pole, given that $1~cm^3$ of iron has 8 gram mass approximately. (Use $\pi = 355/115$)



342. The interior of a building is in the form of a cylinder of base radius 12 m and height 3.5 m, surmounted by a cone of equal base and slant height 12.5 m. Find the internal curved surface area and the capacity of the building.



343. A Right triangle whose sides are 15 cm and 20 cm; is made to revolve about its hypotenuse. Find the volume and surface area of the double cone so formed.



344. A toy is in the form of a cone mounted on a hemisphere with the same radius. The diameter of the base of the conical portion is 6 cm and its height is 4 cm. Determine the surface area of the toy (Use $\pi = 3.14$)



345. Find the mass of a 3.5 m long lead pipe, if the external diameter of the pipe is 2.4 cm, thickness of the metal is 2 mm and the mass of $1 \text{ } cm^3$ of lead is 11.4 grams.
346. A solid is in the form of a cylinder with hemispherical ends. Total height of the solid is 19 cm and the diameter of the cylinder is 7 cm. Find the volume and total surface area of the solid.

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347. The radii of the ends of a bucket of height 24 cm are 15 cm

and 5 cm. Find its capacity. (Take $\pi=22/7$)



348. The radii of the ends of a bucket 30 cm high are 21 cm and 7 cm. Find its capacity in litres and the amount of sheet required to make this bucket.

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349. The radii of the ends of a frustum of a right circular cone

are 5 metres and 8 metres and its lateral height is 5 metres. Find

the lateral surface and volume of the frustum.



350. A frustum of a cone is 9 cm thick and the diameters of its circular ends are 28 cm and 4 cm. Find the volume and lateral surface area of the frustum. (Take $\pi=22/7$)



351. A tent is of the shape of a right circular cylinder upto a height of 3 metres and then becomes a right circular cone with a maximum height of 13.5 metres above the ground. Calculate the cost of paintingthe 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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352. An oil funnel made of tin sheet consists of a 10 cm long cylindrical portion attached to a frustum of a cone. If the total height is 22 cm; diameter of the cylindrical portion is 8 cm and the diameter of the top of the funnel is 18 cm; find the area of the tin sheet required to make the funnel.

353. A container is in the form of a frustum of a cone of height 30 cm with radii of its lower and upper ends as 10 cm and 20 cm respectively. Find the capacity and surface area of the container. Also, find the cost of milk which can completely fill the container at the rate of Rs 25 per litre.[Take $\pi = 3.14$]



354. The radii of the bases of a cylinder and a cone are in the ratio of 3:4 and their heights are in the ratio 2 : 3. Find the ratio of their volumes.



355. The heights of two right circular cones are in the ratio 1 : 2 and the perimeters of their bases are in the ratio 3 : 4. Find the ratio of their volumes.

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356. A cone and a sphere have equal radii and equal volumes.

Find the ratio of the diameter of the sphere to the height of the cone.

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357. A cone, a hemisphere and a cylinder stand on equal bases and have the same height. Show that their volumes are in the ratio 1:2:3. **358.** 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 curved surface areas.

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359. Two cubes have their volumes in the ratio 1 : 27. Find the ratio of their surface areas.

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360. Two circular cylinders of equal volumes have their heights in

the ratio 1:2. Find the ratio of their radii.

361. If the volumes of two cones are in the ratio 1:4 and their diameters are in the ratio 4:5, then the ratio of their heights, is (a) 1:5 (b) 5:4 (c) 5:16 (d) 25:64

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362. A sphere and a cube have the same surface. Show that the

ratio of the volume of the sphereto that of the cube is $\sqrt{6}$: $\sqrt{\pi}$.

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363. Determine the ratio of the volume of a cube to that of a sphere which will exactly fit inside the cube.

364. In what ratio are the volumes of a cylinder, a cone and a sphere, if each has the same diameter and the same height? (a) 1 : 3 : 2 (b) 2 : 3 : 1 (c) 3 : 1 : 2 (d) 3 : 2 : 1

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365. A sphere of maximum volume is cut out from a solid hemisphere of radius r. The ratio of the volume of the hemisphere to that of the cut out sphere is: (a) 3:2 (b) 4:1 (c) 4:3 (d) 7:4

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366. A right circular cone and a right circular cylinder have equal base and equal height. If the radius of the base and the height

are in the ratio 5 : 12, then the ratio of the total surface area of the cylinder to that of the cone is (a) 3 : 1 (b) 13 : 9 (c) 17 : 9 (d) 34

: 9



367. A cone, a hemisphere and a cylinder stand on equal bases and have the same height. Show that their volumes are in the ratio 1:2:3.



368. The radii of two cones are in the ratio 2 : 1, their volumes are equal. Find the ratio of their heights. (a) 1 : 8 (b) 1 : 4 (c) 2 : 1 (d) 4

: 1

369. Two cones have their heights in the ratio 1:3 and the radii of

their bases in the ratio 3:1. Find the ratio of their volumes.



370. A hemisphere and a cone have equal bases. If their heights are also equal, then the ratio of their curved surfaces will be (a) 1 : 2 (b) 2 : 1 (c) 1 : $\sqrt{2}$ (d) $\sqrt{2}$: 1



371. If r_1 and r_2 denote the radii of the circular bases of the frustum of a cone such that $r_1 > r_2$, then write the ratio of the height of the cone of which the frustum is a part to the height of the frustum.



372. If the slant height of the frustum of a cone is 6 cm and the perimeters of its circular bases are 24 cm and 12 cm respectively. What is the curved surface area of the frustum?



373. If the areas of circular bases of a frustum of a cone are $4 \ cm^2$ and $9 \ cm^2$ respectively and the height of the frustum is 12 cm. What is the volume of the frustum?



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



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



376. The slant height of the frustum of a cone is 5 cm. If the difference between the radii of its two circular ends is 4 cm, write the height of the frustum.



377. Conversion of Sphere into cylinder : The diameter of metallic sphere is 6 cm. It is melted and drawn into a wire having

diameter of the cross section as 0.2 cm. Find the length of the

wire.



378. A metallic sphere of radius 10.5 cm is melted and recast into small right circular cones, each of base radius 3.5 cm and height 3 cm. The number of cones so formed is (a) 105 (b) 113 (c) 126 (d) 135



379. A solid is hemispherical at the bottom and conical above. If the surface areas of the two parts are equal, then the ratio of its radius and the height of its conical part is (a) 1:3 (b) $1:\sqrt{3}$ (c) 1:1 (d) $\sqrt{3}:1$



380. A solid sphere of radius r is melted and cast into the shape of a solid cone of height r, the radius of the base of the cone is (a) 2r (b) 3r (c) r (d) 4r



381. The material of a cone is converted into the shape of a cylinder of equal radius. If height of the cylinder is 5 cm, then height of the cone is (a) 10 cm (b) 15 cm (c) 18 cm (d) 24 cm



382. A circus tent is cylindrical to a height of 4 m and conical above it. If its diameter is 105 m and its slant height is 40 m, the total area of the canvas required in m^2 is (a) 1760 (b) 2640 (c) 3960 (d) 7920

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383. The number of solid spheres, each of diameter 6 cm that could be moulded to form a solid metal cylinder of height 45 cm and diameter 4 cm, is

A. (a) 3

B. (b) 4

C. (c) 5

D. (d) 6

Answer: null

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

A. (a) 4.5 cm

B. (b) 3 cm

C. (c) 4 cm

D. (d) 2 cm

Answer: null



385. If the radii of the circular ends of a bucket of height 40 cm are of lengths 35 cm and 14 cm, then the volume of the bucket in cubic centimeters, is (a) 60060 (b) 80080 (c) 70040 (d) 80160

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386. If a cone is cut into two parts by a horizontal plane passing through the mid-point of its axis, the ratio of the volumes of upper and lower part is (a) 1:2 (b) 2:1 (c) 1:7 (d) 1:8



387. The height of a cone is 40 cm. A small cone is cut off at the top by a plane parallel to its base. If the volume of a small cone

is $\frac{1}{64}$ of the volume of the given cone, at what height above the

base is the section made?

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388. A solid consists of a circular cylinder with an exact fitting right circular cone placed at the top. The height of the cone is h. If the total volume of the solid is 3 times the volume of the cone, then the height of the circular cylinder is (a) 2h (b) $\frac{2h}{3}$ (c) $\frac{3h}{2}$ (d) 4h

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389. A reservoir is in the shape of a frustum of a right circular cone. It is 8 m across at the top and 4 m across at the bottom. If

it is 6 m deep, then its capacity is (a) $176\ m^3$ (b) $196\ m^3$ (c) $200\ m^3$ (d) $110\ m^3$

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390. Water flows at the rate of 10 meter per minute through a cylindrical pipe having diameter as 5 mm. How much time will it take to fill a conical vessel whose diameter of base is 40 cm and depth 24 cm?



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



392. The curved surface of a right circular cone of height 15 cm and base diameter 16 cm is

(a) $60\pi~cm^2$

(b) $68\pi~cm^2$

(c) $120\pi \ cm^2$

(d) $136\pi~cm^2$



393. A right triangle with sides 3 cm, 4 cm and 5 cm is rotated about the side of 3 cm to form a cone. The volume of the cone so formed is (a) $12\pi \ cm^3$ (b) $15\pi \ cm^3$ (c) $16\pi \ cm^3$ (d) $20\pi \ cm^3$

394. The curved surface area of a cylindrical pillar is $264m^2$ and its volume is $924m^3$. Find the ratio of its diameter to its height.

A. (a) 3 : 7 B. (b) 7 : 3 C. (c) 6 : 7 D. (d) 7 : 6

Answer: null



395. A cylinder with base radius of 8 cm and height of 2 cm is melted to form a cone of height 6 cm. The radius of the cone is

(a) 4 cm

(b) 5 cm

(c) 6 cm

(d) 8 cm



396. The volumes of two spheres are in the ratio of 64 : 27. The ratio of their surface areas is (a) 1 : 2 (b) 2 : 3 (c) 9 : 16 (d) 16 : 9

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397. If three metallic spheres of radii 6 cm, 8 cm and 10 cm are

melted to form a single sphere, the diameter of the sphere is

(a) 12 cm

(b) 24 cm

(c) 30 cm

(d) 36 cm



398. The surface area of a sphere is same as the curved surface area of a right circular cylinder whose height and diameter are 12 cm each. The radius of the sphere is (a) 3 cm (b) 4 cm (c) 6 cm (d) 12 cm

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399. The volume of the greatest sphere that can be cut off from

a cylindrical log of wood of base radius 1 cm and height 5 cm is

(a)
$$\frac{4}{3}\pi$$
 (b) $\frac{10}{3}\pi$ (c) 5π (d) $\frac{20}{3}\pi$

400. A cylindrical vessel of radius 4 cm contains water. A solid sphere of radius 3 cm is lowered into the water until it is completely immersed. The water level in the vessel will rise by: $\frac{2}{9}cm$ (b) $\frac{4}{9}cm$ (c) $\frac{9}{4}cm$ (d) $\frac{9}{2}cm$

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401. 12 spheres of the same size are made from melting a solid cylinder of 16 cm diameter and 2 cm height. The diameter of each sphere is (a) $\sqrt{3}cm$ (b) 2 cm (c) 3 cm (d) 4 cm



402. A solid metallic spherical ball of diameter 6 cm is melted and recast into a cone with diameter of the base as 12 cm. The



cm



403. A hollow sphere of internal and external diameters 4 cm and 8 cm respectively is melted into a cone of base diameter 8 cm. The height of the cone is (a) 12 cm (b) 14 cm (c) 15 cm (d) 18 cm

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404. A solid piece of iron of dimensions $49 \times 33 \times 24$ cm is moulded into a sphere. The radius of the sphere is (a) 21 cm (b) 28 cm (c) 35 cm (d) None of these

405. The ratio of lateral surface area to the total surface area of a cylinder with base diameter 1.6 m and height 20 cm is (a) 1:7(b) 1:5 (c) 7:1 (d) 5:1

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406. A solid consists of a circular cylinder with an exact fitting right circular cone placed at the top. The height of the cone is h. If the total volume of the solid is 3 times the volume of the cone, then the height of the circular cylinder is 2h (b) $\frac{2h}{3}$ (c) $\frac{3h}{2}$ (d) 4h

407. Find the maximum volume of a cone that can be carved out

of a solid hemisphere of radius r.



408. The radii of the bases of two cylinders are in the ratio 3 : 5 and their heights are in the ratio 2 : 3. Find the ratio of their curved surface areas.



409. A right circular cylinder of radius r and height h~(h>2r)

just encloses a sphere of diameter (a) h (b) r (c) 2r (d) 2h



410. The radii of the circular ends of a frustum are 6 cm and 14

cm. If its slant height is 10 cm, then its vertical height is

(a) 6 cm

(b) 8 cm

(c) 4 cm

(d) 7 cm

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411. The height and radius of the cone of which the frustum is a part are h_1 and r_1 respectively. If h_2 and r_2 are the heights and radius of the smaller base of the frustum respectively and $h_2: h_1 = 1:2$, then $r_2: r_1$ is equal to (a) 1:3 (b) 1:2 (c) 2:1 (d) 3:1

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

(a) $321\pi cm^2$

(b) $300\pi cm^2$

(c) $260\pi cm^2$

(d) $250\pi cm^2$

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413. A solid frustum is of height 8 cm. If the radii of its lower and upper ends are 3 cm and 9 cm respectively, then its slant height

is

(a) 15 cm

(b) 12 cm

(c) 10 cm

(d) 17 cm



414. The radii of the ends of a bucket 16 cm high are 20 cm and 8 cm. The curved surface area of the bucket is $1760 \ cm^2$ (b) $2240 \ cm^2$ (c) $880 \ cm^2$ (d) $3120 \ cm^2$



415. The diameters of the top and the bottom portions of a bucket are 42cm and 28cm. If the height of the bucket is 24cm, then find the cost of painting its outer surface at the rate of 5 paise $/cm^2$.

416. If four times the sum of the areas of two circular faces of a cylinder of height 8 cm is equal to twice the curve surface area, then diameter of the cylinder is (a) 4 cm (b) 8 cm (c) 2 cm (d) 6 cm



417. If the radius of the base of a right circular cylinder is halved, keeping the height same, what is the ratio of the volume of the reduce cylinder to that of the original.



418. A metallic solid cone is melted to form a solid cylinder of equal radius. If the height of the cylinder is 6 cm, then the height



cm

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419. A rectangular sheet of paper $40cm \times 22cm$, is rolled to form a hollow cylinder of height 40 cm. The radius of the cylinder (in cm) is (a) 3.5 (b) 7 (c) 80/7 (d) 5



420. The number of solid spheres, each of diameter 6 cm that can be made by melting a solid metal cylinder of height 45 cm and diameter 4 cm is (a) 3 (b) 5 (c) 4 (d) 6