MATHS

BOOKS - VIDHYASANGAM - RAO'S ACADEMY MATHS (KANNADA ENGLISH)

SURFACE AREAS AND VOLUMES

Exercise 13 1

1. 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 :

The area of the sheet required for making the box.

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2. 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 :

The cost of sheet for it, if a sheet measuring $1m^2$ costs Rs 20.

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3. 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 ceilling at the rate of Rs 7.50 per m^2.

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4. The floor of a rectangular hall 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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5. The paint in a certain container is sufficient to paint an area equal to $9.375m^2$. How many bricks of dimensions $22.5cm \times 10cm \times 7.5cm$ can be painted out of this countainer ?

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6. A cubical box has each edge 10 cm and another cuboidal box is 12.5 cm long. 10 cm wide and 8 cm high.

Which box has the greater lateral surface area and by how much ?

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7. A cubical box has each edge 10 cm and another cuboidal box is 12.5 cm long. 10 cm wide and 8 cm high.

Which box has the smaller total surface area and by how much ?

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

wide and 25 cm high.

What is the area of the glass ?

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9. A small indoor greenhouse (herbarium) is made entirely of glass panes (including base) held togther 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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10. 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 $25cm \times 20 \times 5cm$ and the smaller of dimensions $15cm \times 12 \times 5cm$. For all the overlaps, $5\,\%$ of the total surface area is required extra. If the cost of the cardboard is Rs 4 for $1000cm^2$, find the cost of cardboard required for supplying 250 boxes of each kind.

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11. Parveen wated to make a temporary shelter for her car, by making a box - like structurer 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 stiching margins are very small, and therefore neglible, how much tarpaulin would be required to make the shelter of height 2.5 m, with base dimensoins $4m \times 3m$?

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Exercise 13 2

1. The curved surface area of a right circular cylinder of height 14 cm is $88cm^2$. Find the diameter of the base of the cylinder.

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2. 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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3. 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 its inner curved surface.

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4. 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 its outer curved surface area.

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5. 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 its total surface area.

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6. 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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7. A cylindrical pilar 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 Rs 12.50 per m^2.

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

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

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

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11. 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.

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12. Find

the lateral or curved surface area of a closed cylindrical petrol storage tank that is 4.2 m in diameter and 4.5m high.

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13. Find

bow much steel was actually used, if $\frac{1}{12}$ of the steel actually used was wasted in making the tank.

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14. In Fig.13.12, 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.

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15. 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 heigh 105. 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 ?

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Exercise 13 3

1. Diameter of the base of a cone is 10.5 cm and its slant height is 10 cm. Find its curved surface area.

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2. Find the total surface area of a cone, if its slant height is 21 m and diameter of its base is 24 m.

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3. Curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. Find radius of the base.

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4. Curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. Find total surface area of the cone.

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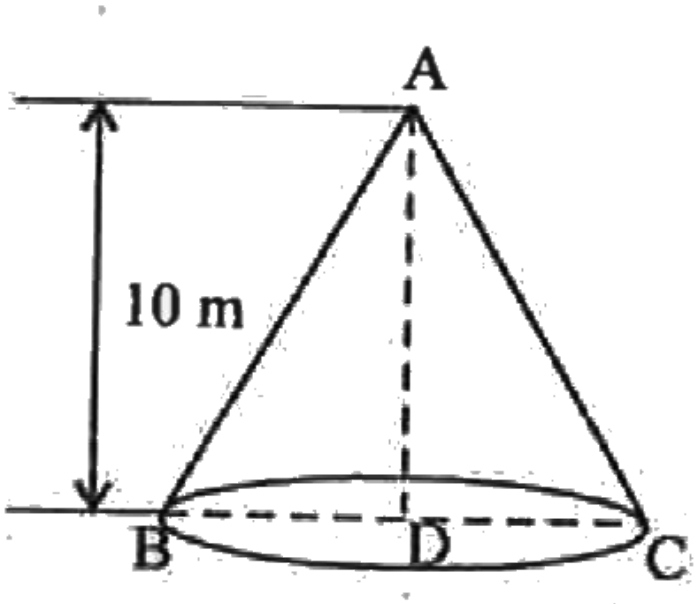
5. A conical tent is 10 m high and the radius of its base is 24 m. Find slant height of the tent.



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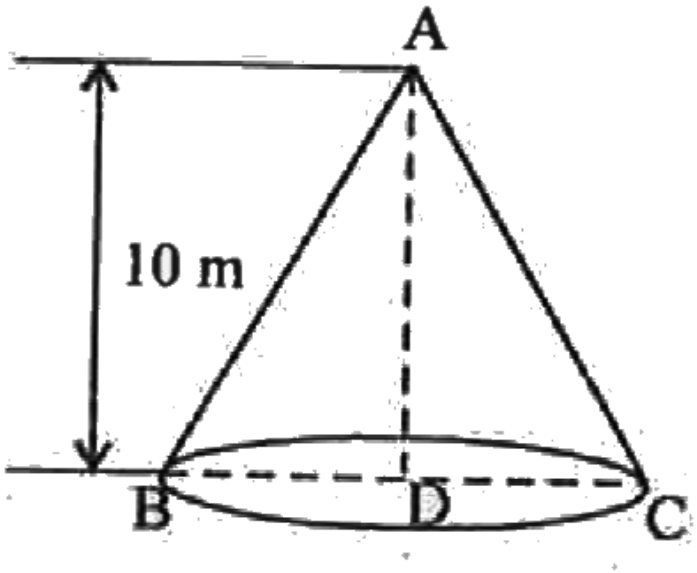
6. A conical tent is 10 m high and the radius of its base is 24 m. Find

cost of the canvas requiered to make the tent, if the cost of $1m^2$ canvas is Rs 70.



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

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8. The slant height and base diameter of a conical tomb are 25 m and 14 m respectively.

Find the cost of white washing its curved surface at the cost of Rs 210 per $100m^2$.

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9. A joker's cap is in the form of a right circular cone of base radius 7cm and height 24 cm. Find the area of the sheet required ot make 10 such caps.

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10. A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recyled 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 ?

$(\text{Use}\pi = 3.14 \text{ and take } \sqrt{1.04} = 1.02)$

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Exercise 13 4

1. Find the surface area of a sphere of radius :

10.5 cm

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2. Find the surface area of a sphere of radius :

5.6 cm

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3. Find the surface area of a sphere of radius :

14 cm

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4. Find the surface area of a sphere of diameter :

14 cm

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5. Find the surface area of a sphere of diameter :

21 cm

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6. Find the surface area of a sphere of diameter :

3.5 m

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7. Find the total surface area of a hemishphere for radius 10 cm. $(\text{Use}\pi = 3.14)$

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8. 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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9. A hemispherical bowl made of brass inner diameter 10.5 cm. Find the cost of tin-plating it on the inside at the rate of Rs 16 per $100cm^2$.

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10. Find the radius of a sphere whose surface area is $154cm^2$.

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11. The diameter of the moon is approximately one fourth of the diameter of the earth. Find the ratio of their surface areas.

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12. A hemispherical bowl 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.

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13. A right circular cylinder just encloses a sphere of radius r. Find

surface area of the sphere.

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14. A right circular cylinder just encloses a sphere of radius r. Find

curved surface area of the cylinder.

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15. A right circular cylinder just encloses a sphere of radius r. Find

ratio of the areas obtained in (i) and (ii).

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Exercise 13 5

1. A matchbox measure $4cm \times 2.5cm \times 1.5cm$. What will be the volume of a packet containing 12 such boxes ?

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2. A cuboidal water tank is 6 m long, 5 m wide and 4.5 m deep. How many litres of water can it hold ?

$(1m^3 = 1000l)$

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3. A cuboidal vessel is 10 m long and 8 m wide. How high must it be made to hold 380 cubic metres of a liquid ?

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Exercise 13 6

1. 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 ? $\left(1000cm^3 = 1l\right)$

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2. The inner diameter of a cylinderical wooden pipe is 24 cm and its outer diameter is 28 cm. The length of the pipe is 35 cm. Find the mass of the pipe, if $1cm^3$ of wood has a mass of 0.6 g.

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3. A soft drink is available in two packs - (i) a tin can with a rectangular base of length 5 cm and widh 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 ?

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

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Exercise 13 7

1. Find the volume of the right circular cone with

radius 6 cm, height 7 cm

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2. Find the volume of the right circular cone with

radius 3.5 cm, height 12 cm.

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3. Find the capacity in litres of a conical vessel with

radius 7 cm, slant height 25 cm ($1000cm^3 = 1l$)

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4. Find the volume of a conical vessel with height 12 cm, slant height 13 cm

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

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

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7. A conical pit of top diameter 3.5 m is 12 m deep. What is its capacity in kilolitres ?

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8. The volume of a right circular cone is $9856cm^3$. If the diameter of the base is 28 cm, find

height of the cone

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9. The volume of a right circular cone is $9856cm^3$. If the diameter of the base is 28 cm, find

slant height of the cone

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10. The volume of a right circular cone is $9856cm^3$. If the diameter of the base is 28 cm, find

curved surface area of the cone

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11. 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.

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12. If the triangle ABC in the Question 7 above is revolved about the side 5 cm, then find the volume of the solid so obtained. Find also the ratio of the volume of the two solids obtained in Questions 7 andd 8.

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13. A heap of wheat is in the form of a cone whose diameter is 10.5 m and height is 3m. 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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Exercise 13 8

1. Find the volume of a sphere whose radius is

7 cm

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2. Find the volume of a sphere whose radius is

0.63 m

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3. A hemishpherical 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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4. Find the radius of a sphere whose surface area is $154cm^2$.

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5. A dome of a building is in the form of a hemishphere. From inside, it was white-washed at the cost of Rs 498.96. If the cost of white - washing is Rs 2.00 per square metre, find the

inside surface area of the dome.

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6. A done of a building is in the form of a hemishphere. From inside, it was white-washed at the cost of Rs 498.96. If the cost of

white - washing is Rs 2.00 per square metre, find the

volume of the air inside the dome.

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

radius r' of the new sphere.

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8. Twenty seven solid iron sphere, 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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9. A capsule of medicine is in the shape of a sphere of diameter 3.5 mm. How much medicine $(\text{in } mm^3)$ is needed to fill this capsule ?

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Exercise 13 9

1. The diameter of a sphere is decreased by $25\,\%$. By what per cent does its curved surface area decrease ?

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