MATHS

BOOKS - CAMBRIDGE MATHS (KANNADA ENGLISH)

SURFACE AREAS AND VOLUMES

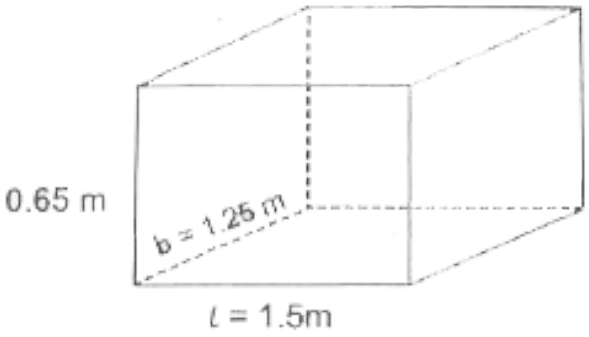
Exersice 13 1

1. A plastic box $1.5m$ long, $1.25m$ wide and 65 cm deep is to be made. It is opened at the

top.Ignorian the thickness of the plastic sheet, determine:

(i) The area of the sheet required for making the box.

(ii) The cost of sheet for it, if a sheet measureing $1m^2$ costs `Rs 20.



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2. 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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3. 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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4. 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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5. A cubical box has each edge 10 cm and another cuboidal box is 12.5 cm long, 10 cm wide and 8 cm high.

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

(ii) Which box has the smallest total surface area and by how much ?

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6. A small indoor greenhouse (herbarium) is made entirely of glass panes (including base) held together with tapeIt is 30 cm long, 25 cm wide and 25 cm high.

(i) What is the area of the glass ?

(ii) How much of tape is needed for all the 12 edges ?

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7. 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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8. 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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Exersice 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

total surface area.

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4. 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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5. 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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6. 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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7. The inner diameter of a circular well is $3.5m$. It is 10 m deep. Find

(i) Its inner curved surface Area,

(ii) The cost of plastering this curved surface at the rate of Rs 40 per m^2.

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8. In a hot water heating system, there is a cylindrical pipe of length 28 m and dimater 5

cm. Find the total radiating surface in the system.

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9. Find:

(i) The lateral or curved surface Area of a closed cylindrical petrol stronge tank that is $4.2m$ in diameter and 4.5 m high.

(ii) How much steel was actully used, if $\frac{1}{12}$ of the steel actually was wasted in making the tank.

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10. In the given you see, the frame of a lampshede. 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 $2.5cm$ 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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11. The students of a Vidyalya were asked to participate in a competition for maiking and decorating pen holders in the shape of a cylinder with a base, using carboard. Each penholder was to be of radius 3 cm and height 10.5 cm. The Vidhaly was to supply the competittors with cardboard. If there were 35 competitiors, how much carboard was required to be bought for the competition ?

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Exersice 13 3

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

(i) slant height of the tent.

(ii) cost of the canvas required to make the tent, if the cost of $1m^2$ canvas is Rs 70.

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

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6. The slant height and base diamater of a conical tomb are 25 m and 14m respectively. Find the cost of with-washing its curved surface at the rate of Rs 210 per $100m^2$.

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7. 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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8. 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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Exersice 13 4

1. Find the surface area of a sphere of radius

(i) $10.5cm$

(ii) $5.6cm$

(iii) $14cm$

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2. Find the surface Area of a sphere of diameter

(i) 14 cm

(ii) 21 cm

(iii) 3.5 cm

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

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4. 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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5. 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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6. Find the radius of a sphere whose surface area is $154cm^2$.

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7. 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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8. 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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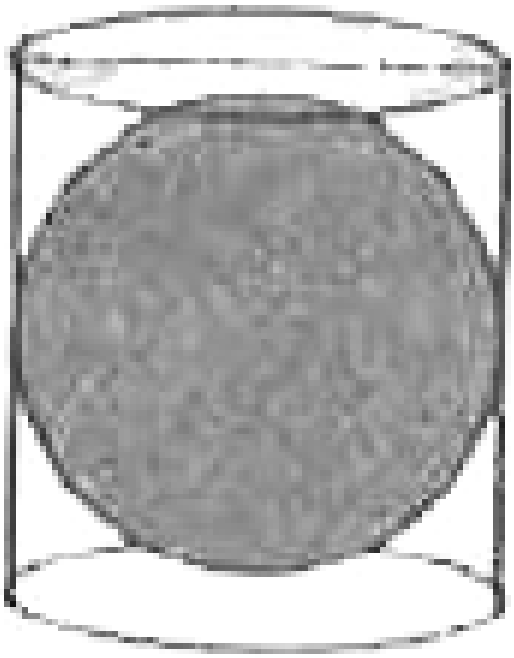
9. A right circular cylinder just encloses a sphere of radius r. Find

(i) Durface Area of the sphere

(ii) Curved surface area of the cylinder

(iii) Ratio of the areas obtained in (i) and (ii)



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Exersice 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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4. Find the cost od digging a cuboidal pit 8 m long, 6m broad and 3 m deep at the rate of Rs 30 per m^3

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5. The capacity of a cuboidal tank is 50000 litres of water. Find the breadth of the tank if its length and depth are respectively $2.5m$ and 10 m.

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6. A village having a population of 4000 requires 150 litres of water per head per day. It has a tank measureing $20m \times 15m \times 6m$. For how many days will the water of this tank last ?

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7. A godown measures $40m \times 25m \times 15m$. Find the maximum number of wooden creater each measureing $1.5m \times 0.5m$ that can be stored in the godown.

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

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

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

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Exersice 13 6

1. The circumference of the base of cylindrical vessel is 132 cm and its height is 25 cm. How many litres of water can it hold $(1000cm^3 = 1l)$

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2. The inner diameter of a cylindrical wooden pipe is 24 cm. and its outer diamter 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 $0.6g$.

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3. A soft drink is available in two packs:

(i) A tin can with a reetangular base of length 5 cm and width 4 cm, having a height of 15 cm and

(ii) A plastic cylinder with circular base of diameter 7 cm and height 10 cm.

Which container has greater capacity and by how much ?

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4. If the lateral surface of a cylinder is $94.2cm^2$ and hight is 5 cm, then find:

(i) radius of its base

(ii) its volume

(iii) $(\pi = 3.14)$

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

find:

(i) inner curved surface area of the vessel,

(ii) radius of the base,

(iii) capacity of the vessel.

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6. The capacity of a closed cylindrical vessel of height 1m is 15.4 litres. How many square meters of metal sheet would be needed to make it.

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7. A lead pencil consists of a cylinder of wood with a solid cylinder of graphite filled in the interior. The diameter of the pencil is 7 mm and the diameter of the graphite is 1 mm. If the length of the pencil is 14 cm, find the volume of the wood and that of the graphite.

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8. A patient in a hospital is given soup daily in a cylindrical bowl of diameter 7 cm. If the bowl

is filled with soup to a height of 4 cm, how much soup the hospital has to prepare daily to serve 250 patients ?

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Exersice 13 7

1. Find the volume of the right circular cone with

(i) radius $= 6cm,$ height $= 7cm$

(ii) radius $= 3.5cm,$ height $= 12$ cm

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2. Find the capacity in lites of a conical vessel with

(i) radius =7 cm, slant height = 25 cm

(ii) height = 12 cm, slant height = 13 cm

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3. The height of a cone is 15 cm. If its volume is $1570cm^3$. Find the radius of the base. (Use $\pi = 3.14$)

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4. IF the volume of right circular cone of height 9 cm is $48\pi cm^3$. Find the diameter of its base.

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5. A conical pit of top diamteter $3.5m$ is 12 m deep. What is its capacity in kilolitres ?

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6. The volume of a right circular cone is 9856 cm. If the diameter of the base is 28 cm. Find

(i) the height of the cone

(ii) slant height of the cone

(iii) curved surface area of the cone

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7. 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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8. 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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9. A heap of wheat is in the form of a cone shose diameter is 10.5 m and height 3 m. Find its volume. The heap is to be covered by canvas to protect it from rain. Find the area of the canvas required

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Exersice 13 8

1. Find the volume of a sphere whose radius is

(i) 7 cm,

(ii) $0.63m$

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2. Find the amount of water displayed by a solid spherical ball of diameter

(i) 28 cm

(ii) $0.21m$

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3. The diameter of a metallic ballis 4.2 cm. What is the mass of the ball, if the density of the metal is 8.9 g per cm^3

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4. The diameter of the moon is approximately one fourth of the diameter of the earth. What fraction of the volume of the earth is the volume of the moon ?

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

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6. A hemispherical tank is made up of an iron sheet 1 cm thick. If the inner radius is 1m, then find the volume of the iron use to meke the tnak.

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7. Find the volume of a sphere whose surface area is $154cm^2$.

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8. A dome of a building is in the form of a hemisphere. From inside, it was white-washed at the cost of Rs 498.96. If the cost of white-washing is $Rs2.00$ per sq. m. Find the :

(i) inside surface area of the dome

(ii) volume of the air inside the dome.

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9. Twenty seven solid iron spheres, each of radius r and surface area S aer melted to form a sphere with surface area S^1. Find the

(i) radius r_1 of the nw sphere

(ii) ratio of S and S^1

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

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