MATHS

NCERT - NCERT MATHS (GUJARATI ENGLISH)

MENSURATION

Example

1. The radius of conical tent is 7 meters and its height is 10 meters. Calculate the length of

canvas used in making the tent if the width of canvas is 2 m [Use $\pi = \frac{22}{7}$]

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2. A oil drum is in the shape of a cylinder having the following dimensions : diameter is 2 m and heights is 7 m . The painter charges Rs. 3 per m^2 to paint the drum. Find the total charges to be paid to the painter for 10 drums ?

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3. A sphere , a cylinder and a cone are of the same radius and same height . Find the ratio of their curved surface areas.

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4. A company wants to manufacture 1000 hemispherical basins from a steel sheet . If the radius of each basin is 21 cm, find the area of steel required to manufacture the above hemispherical basins ?

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5. A right circular cylinder has base radius 14 cm and height 21 cm.

Find its area of base (or area of each end)

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6. A right circular cylinder has base radius 14 cm and height 21 cm.

Find its curved surface area.

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7. A right circular cylinder has base radius 14 cm and height 21 cm.

Find its total surface area.

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8. A right circular cylinder has base radius 14 cm and height 21 cm.

Find its volume.

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9. Find the volume and surface area of a sphere of radius 2.1 cm $\left(\pi = \frac{22}{7}\right)$

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10. Find the volume and the total surface area of a hemisphere of radius 3.5 cm . $\left(\pi = \frac{22}{7}\right)$

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11. A right triangle, whose base and height are 15 cm and 20 cm respectively is made to revolve about its hypotenuse. Find the volume and surface area of the double cone so formed.

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12. A wooden toy rocke is in the shape of a cone mounted on a cylinder, as shown in the given figure. The height of the entire rocket is 26 cm, while the height of the conical part is 6

cm, the base of the concial protion has a diameter of 5 cm, while the base diameter ofthe cylinderical protion is 3 cm. if the concial portion is tobe painted organe and the cylinderical portion yellow. Find the area of the rocke painted with each of these colours. (Take $\pi = 3.14$)

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13. A solid toy is in the form of a right circular cylinder with 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 $\pi = \frac{22}{7}$)

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14. 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 by filling in equal cones and forming hemispherical tops. If the height of the conical portion is twice the diameter of its base. Find the diameter of the ice cream cone.

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15. A solid consisting of a right circular cone standing on a hemisphere , is placed upright in a right circular cylinder full of water and touching the bottom. Find the volume of water left in the cylinder , given that the radius of the cylinder is 3 cm and its height is 6 cm The radius of the hemisphere is 2 cm and the height of the cone is 4 cm . (Take $\pi = \frac{22}{7}$).

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16. A cylindrical pencil is sharpened to produce a perfect cone at one end with no over all its length. The diameter of the pencil is 1 cm and the length of the conical portion is 2 cm. Calculate the volume of the peels. Give your answer correct to two places if it is in decimal [use $\pi = \frac{355}{113}$]

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17. A cone of height 24 cm and radius of base 6 cm is made up of modelling clay. A child

moulds it in the form of a sphere. Find the radius of the shape.

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18. The diameter of the internal and external surfaces of a hollow hemispherical shell are 6 cm and 10 cm respectively. It is melted and recast into a solid cylinder of diameter 14 cm . Find the height of the cylinder.

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19. A hemispherical bowl of internal radius 15 cm contains a liquid. The liquid is to be filled into cylindrical bottles of diameter 5 cm and height 6 cm How many bottles are necessary to empty the bowl ?

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20. The diameter of a metallic sphere is 6 cm. It is melted and drawn into a long wire having a circular cross section of diameter as 0.2 cm . Find the length of the wire.

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21. How many spherical balls can be made out of a solid cube of lead whose edge measures 44 cm and each ball being 4 cm in diameter.

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22. A women selfhelp group (DWACRA) is supplied a rectangular solid (cuboid shape) of wax block with dimensions 66 cm , 42 cm, 21

cm , to prepare cylindrical candles each 4.2 cm in diameter and 2.8 cm of height . Find the number of candles prepared using this so solid .

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Exercise 10 1

1. A joker's cap is in the form of right circular cone whose base radius is 7 cm and heights is

24 cm . Find the area of the sheet required to make 10 such caps.

2. A sports company was ordered to prepare 100 paper cylinders for packing shuttle cocks. The requried dimensions of the cylinder are 35 cm length/height and its radius is 7 cm . Find the required area of thick paper sheet needed to make 100 cylinders ?

3. Find the volume of right circular cone with radius 6 cm and height 7 cm.

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4. The lateral surface area of a cylinder is equal to the curved surface area of cone . If their bases are the same, find the ratio of the height of the cylinder to the slant height of the cone.

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5. A self help group wants to manufacture joker's caps of 3 cm. radius and 4 cm height. If the available paper sheet is 1000 cm^2 , then how many caps can be manufactured from that paper sheet ?

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6. A cylinder and cone have bases of equal radii and are of equal heights. Show that their

volumes are in the ratio of 3:1

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7. The shape of solid iron rod is cylinderical Its height is 11 cm and base diameter si 7 cm Then find the total volume of 50 such rods.

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8. A heap of rice is in the form of a cone of diameter 12 cm and height 8 cm . Find its

volume ? How much canvas cloth is required to cover the heap ? (Use $\pi = 3.14$)

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9. The curved surface area of a cone is 4070 cm^2 and its diameter is 70 cm . What is its slant height ?

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Exercise 10 2

1. A toy is in form of a cone mounted on a hemisphere on the same diameter . 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 $\pi = 3.14$]

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2. A solid is in the form of a right circular with a hemisphere at one end and a cone at the other end. The radius of the common base is 8

cm and the heights of the cylindrical and conical portions are 10 cm and 6 cm respectivly. Find the total surface area of the solid [use $\pi = 3.14$]

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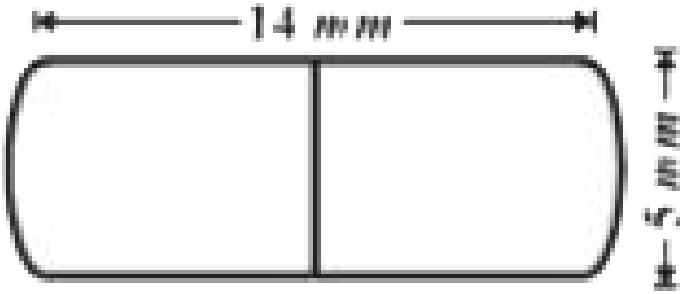
3. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the capsule is 14 mm and the thickness is 5 mm. Find its surface

area.



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

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5. A storage tank consists of a circular cylinder with a hemisphere stuck on either end. If the external diameter of the cylinder be 1.4 cm and its length be 8 m. Find the cost of painting it on the outside at rite of Rs. 20per m^2.

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6. A sphere , a cylinder and a cone have the same radius and same height. Find the ratio of their volumes.

[Hint : Diameter of the sphere is equal to the heights of the cylinder and the cone]

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

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8. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder. As shown in the given figure. 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.

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Exercise 10 3

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

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2. A toy is made in the form of hemisphere sumounted by a right cone whose circular base is joined with the plane surface of the

hemisphere . The radius of the base of the cone is 7 cm and its volume is $\frac{3}{2}$ of the hemisphere . Calculate the height of the cone and the surface area of the toy correct to 2 places of decimal (Take $\pi = 3\frac{1}{7}$)

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3. Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 7 cm.

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4. A cylinderical mug of radius 5 cm and height 9.8 cm is full of water. A solid in the form of right circular cone mounted on a hemisphere is immersed into the mug. The radius of the hemisphere is 3.5 cm ad height of conical part 5 cm . Find the volume of water left in the tub (Take $\pi = \frac{22}{7}$)

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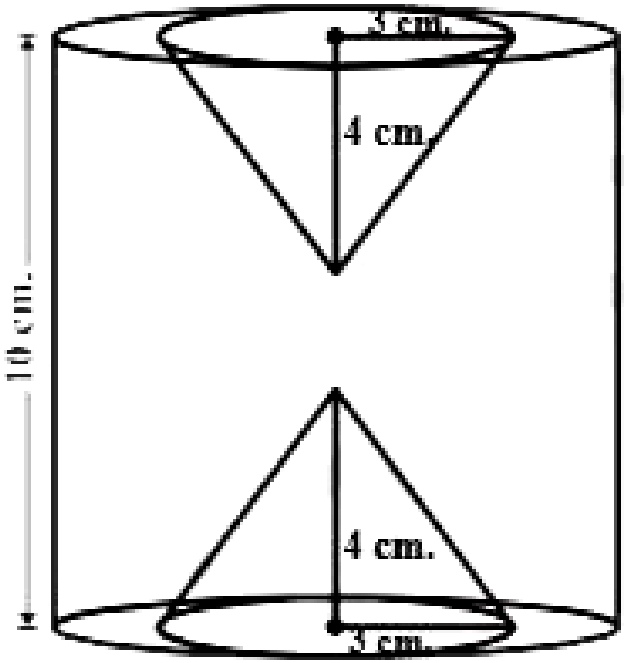
5. In the adjacent figure, the height of a solid cylinder is 10 cm and diameters is 7 cm . Two equal conical holes of radius 3 cm and height 4 cm are cut off as shown the figure. Find the volume of the remaining solid.



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6. Spherical marbles of diameter 1.4 cm are dropped into a cylindrical beaker of diameter 7 cm,which contains some water. Find the number marbles that should be dropped in to the beaker , so that water level rises by 5.6 cm.

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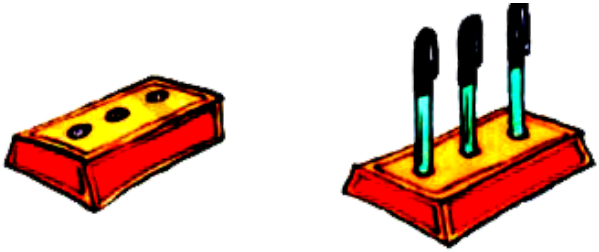
7. A pen stand is made of wood in the shape of cuboid with three conical depressions to hold

the pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of each of the depression is 0.5 cm and the depth is 1.4 cm n the entire stand.



10.4 Conversion of Solid from One Shape to Another

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Exercise 10 4

1. 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.

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

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3. A 20m deep well of diameter 7 m is dug and the earth got by digging is evenly spread out to form a rectangular platform of base 22 m $\times$ 14 m. Find the height of the platform.

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4. A well of diameter 14 m is dug 15 m deep. The earth taken out of it has been spread evenly to form circular embankment all around

the wall of width 7 m. Find the height of the embankment.

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5. A container shpaed like a right circular cylinder having diameter 12 cm and height 15 cm is full of ice creqa. 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.

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

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7. A vessel is in the form of an 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 into the vessel, one fourth of the water flows out. Find the number of lead shots dropped in the vessel.

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8. 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 3cm. Find the number of cones so formed.

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Optional Exercise

1. A golf ball has diameter equal to 4.1 cm. Its surface has 150 dimples each of radius 2 mm. Calculate total surface area which is exposed to the surroundings. (Assume that the dimples are all hemispherical) $\left[\pi = \frac{22}{7}\right]$

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2. A cylinder of radius 12 cm contains water to a depth of 20 cm. When a spherical iron ball is dropped in to the cylinder, the level of water is raised by 6.75 cm. Find the radius of the ball. $\left[\pi = \frac{22}{7}\right]$

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3. 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 heights of

the cylindrical and concial portion are 12 cm. and 7 cm. respectively. Find the volume of the solid toy. $\left[\pi = \frac{22}{7}\right]$

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4. Three metal cubes with edges 15 cm, 12 cm and 9 cm, respectively are melted together and formed into a single cube. Find the diagonal of this cube.

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