INDIAN SCHOOL NIZWA - WORKSHEET

MATHEMATICS

12.Surface Area and Volumes

Name: _____ Date:_____ Class: X Sec: ___

1. The total surface area of solid hemisphere of radius r is

(A) πr^2 (B) $2\pi r^2$ (C) $3\pi r^2$ (D) $4\pi r^2$

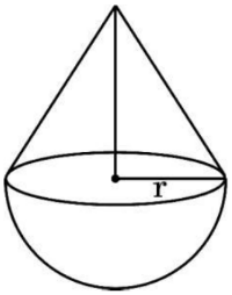
2. The radius of the base of a right circular cone and the radius of a sphere are each 5 cm in length. If the volume of the cone is equal to the volume of the sphere then the height of the cone is

A) 5 cm B) 20 cm C) 10 cm D) 4 cm

3. The volume of a solid hemisphere is $\frac{396}{7}\ cm^3$.The total surface area of the solid hemisphere (in sq.cm) is

A) $\frac{396}{7}$ B) $\frac{594}{7}$ C) $\frac{549}{7}$ D) $\frac{604}{7}$

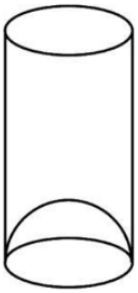
4. A solid is of the form of a cone of radius 'r' surmounted on a hemisphere of the same radius. If the height of the cone is the same as the diameter of its base, then the volume of the solid is :



(a) πr^3 (b) $\frac{4}{3}\pi r^3$

(c) $3\pi r^3$ (d) $\frac{2}{3}\pi r^3$

5. A juice seller was serving his customers using glasses as shown in the figure. The inner diameter of the cylindrical glass was 5·6 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of the glass was 10 cm, find the apparent capacity and the actual capacity of the glass.



6. An open metal bucket is in the shape of a frustum of cone of height 21 cm with radii of its lower and upper ends are 10 cm and 20 cm respectively. Find the cost of milk which can completely fill the bucket at the rate of ₹ 40 per litre.

7. In Figure-6, a tent is in the shape of a cylinder surmounted by a conical top. The cylindrical part is 2·1 m high and conical part has slant height 2·8 m. Both the parts have same radius 2 m. Find the area of the canvas used to make the tent. (Use $\pi = \frac{22}{7}$)

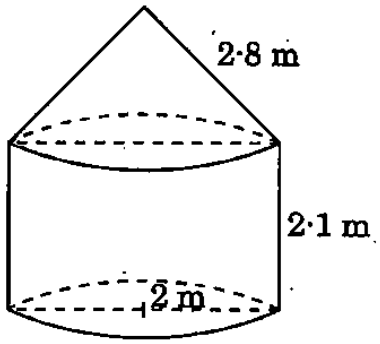


Figure-6

8. A solid is in the shape of a cone surmounted on a hemisphere. The radius of each of them being 3.5 cm and the total height of the solid is 9.5 cm. Find the volume of the solid.

9. A wooden toy is shown in the picture. This is a cuboidal wooden block of dimensions 14 cm × 17 cm × 4 cm. On its top there are seven cylindrical hollows for bees to fit in. Each cylindrical hollow is of height 3 cm and radius 2 cm.

Based on the above, answer the following questions :

(i) Find the volume of wood carved out to make one cylindrical hollow.

(ii) Find the lateral surface area of the cuboid to paint it with green colour.

(iii) (a) Find the volume of wood in the remaining cuboid after carving out seven cylindrical hollows.

OR

(iii) (b) Find the surface area of the top surface of the cuboid to be painted yellow.

10.

Metallic silos are used by farmers for storing grains. Farmer Girdhar has decided to build a new metallic silo to store his harvested grains. It is in the shape of a cylinder mounted by a cone.

Dimensions of the conical part of a silo is as follows:

Radius of base = 1.5 m

Height = 2 m

Dimensions of the cylindrical part of a silo is as follows:

Radius = 1.5 m

Height = 7 m

On the basis of the above information answer the following questions.

(i) Calculate the slant height of the conical part of one silo.

(ii) Find the curved surface area of the conical part of one silo.

(iii)(A) Find the cost of metal sheet used to make the curved cylindrical part of 1 silo at the rate of ₹2000 per m^2.

OR

(iii) (B) Find the total capacity of one silo to store grains.

11. Rinku was very happy to receive a fancy jumbo pencil from his best friend Rohan on his birthday. Pencil is a basic writing tool, when sharpened its shape is a combination of cylinder & cone as given in the picture.

Cylindrical pencil with conical head is a common shape worldwide since ages. Commonly pencils are made up of wood & plastic but we should promote pencils made up of eco-friendly material (many options available in the market these days) to save environment.



The dimensions of Rinku's pencil are given as follows:

Length of cylindrical portion is 21cm. Diameter of the base is 1 cm and height of the conical portion is 1.2 cm

Based on the above information, answer the following questions:

i) Find the slant height of the sharpened part.

ii) Find curved surface area of sharpened part (in terms of π).

iii) Find the total surface area of the pencil (in terms of π).

OR

The pencil's total height decreases by 8.2 cm after sharpening it many times, what is the volume of the cylindrical part of the shortened pencil (in terms of π)?

11. In a coffee shop, coffee is served in two types of cups. One is cylindrical in shape with diameter 7 cm and height 14 cm and the other is hemispherical with diameter 21 cm.





(i) Find the area of the base of the cylindrical cup.

(ii) (a) What is the capacity of the hemispherical cup ?

OR

(ii) (b) Find the capacity of the cylindrical cup.

(iii) What is the curved surface area of the cylindrical cup ?