



INDIAN SCHOOL AL WADI AL KABIR

Class X, Mathematics

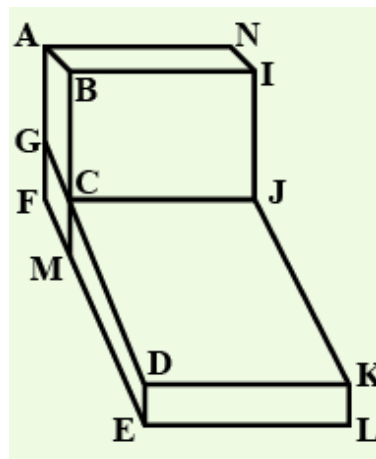
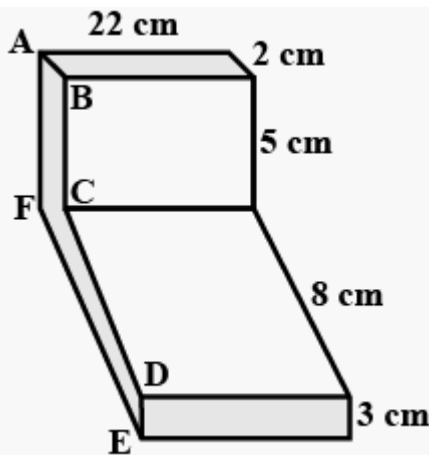
Worksheet-SURFACE AREAS AND VOLUMES

Questions of 2 marks each

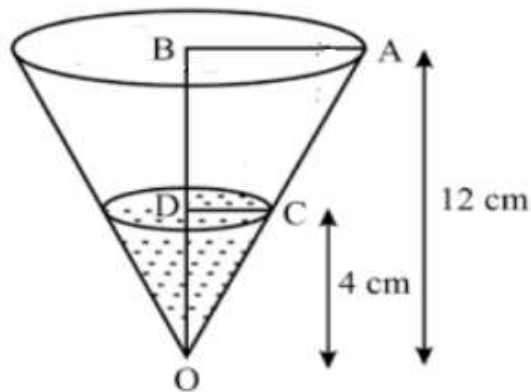
1. A girl empties a cylindrical bucket, full of sand, of base radius 18 cm and height 32 cm, on the floor to form a conical heap of sand. If the height of this conical heap is 24 cm, then find its slant height correct up to one place of decimal.
2. The largest possible sphere is carved out of a wooden solid cube of side 7 cm. Find the volume of the wood left.
3. A solid cube is cut into two cuboids of equal volumes. Find the ratio of the total surface area of the given cube and that of one of the cuboids.
4. The circumference of the base of a 9 m high wooden solid cone is 44 m. Find the volume of the cone.
5. Given that 1 cu.cm. of marble weighs 25 g, the weight of a marble block of 28 cm in width and 5 cm thick, is 112 kg. What will be the length of block?

Questions of 3 marks each

6. 150 spherical marbles, each of radius 1.4 cm, are dropped in a cylindrical vessel of radius 7 cm containing some water, which are completely immersed in water. Find the rise in the level of water in the vessel.
7. In the figure, the shape of a solid copper piece (made of two pieces) with dimensions as shown. The face ABCDEFA has uniform cross section. Assume that the angles at A, B, C, D, E and F are right angles. Calculate the volume of the piece.

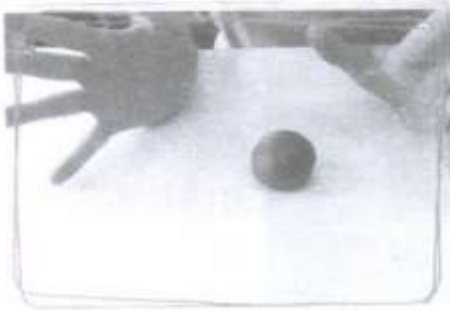


8.	A heap of wheat is in the form of a cone whose diameter and height are 10.5 m and 3 m respectively. Find its volume. The heap is to be covered by canvas to protect it from rain. Find the area of the canvas required.
9.	50 circular plates, each of radius 7 cm and thickness $\frac{1}{2}$ cm, are placed one above another to form a solid right circular cylinder. Find the total surface area and the volume of the cylinder so formed.
Questions of 4 marks each	
10.	A solid composed of a cylinder with hemispherical ends. if the whole length of the solid is 108 cm and the diameter of the hemispherical end is 36 cm, find the cost of polishing its surface at the rate of 70 paise per square cm.
11.	Wax cylinder of diameter 21cm and height 21cm is chipped off and shaped to form a cone of maximum volume. The chipped off wax is recast into a solid sphere. Find the diameter of the sphere.
12.	The $\left(\frac{3}{4}\right)^{th}$ part of a conical vessel of radius 5 cm and height 24 cm is full of water. The water is poured into a cuboidal box with length 22.4 cm and breadth 2.5 cm. Find the height of water level in the cuboidal box .
13.	An inverted cone of vertical height 12 cm and the radius of base 9 cm contains water to a depth of 4 cm. Find the area of the interior surface of the cone not in contact with the water.



CASE STUDY 1:

To make the learning process more interesting, creative and innovative, Amayras the class teacher brings clay in the classroom, to teach the topic - Surface Areas and Volumes. With clay, she forms a cylinder of radius 6 cm and height 8 cm. Then she moulds the cylinder into a sphere and asks some questions to students.



14. What is the radius of the sphere so formed?
15. Find the volume of the sphere.
16. What will be the ratio of the volume of sphere to the volume of cylinder?
17. Find the total surface area of the cylinder.
18. During the conversion of a solid from one shape to another, What will happen to the volume of new shape?

CASE STUDY 2:

Meera and Dhara have 12 and 8 coins respectively each of radius 3.5 cm and thickness 0.5 cm. They place their coins one above the other to form solid cylinders .



Based on the above information, answer the following questions.

19. What is the curved surface area of the cylinder made by Meera?
20. Find the ratio of curved surface area of the cylinders made by Meera and Dhara.

21.	Find the volume of the cylinder made by Dhara.							
22.	When two coins are shifted from Dhara's cylinder to Meera's cylinder, then find the total surface area of so formed cylinder.							
Answers								
Answers	1	43.2 cm	2	163.33 cu.cm	3	3:2	4	462 cu. m
	5	3.2 cm	6	5.6 cm	7	880 cu.cm	8	86.625 cu. m 99.77 sq. m
	9	1408 sq. cm	10	₹ 855.36	11	21 cm	12	22 cm
	13	377.14 sq. cm	14	6 cm	15	905.14 cu. cm	16	1 : 1
	17	528 sq. cm	18	remains unaltered	19	132 sq. cm	20	3 : 2
	21	154 cu. cm	22	213 sq. cm				