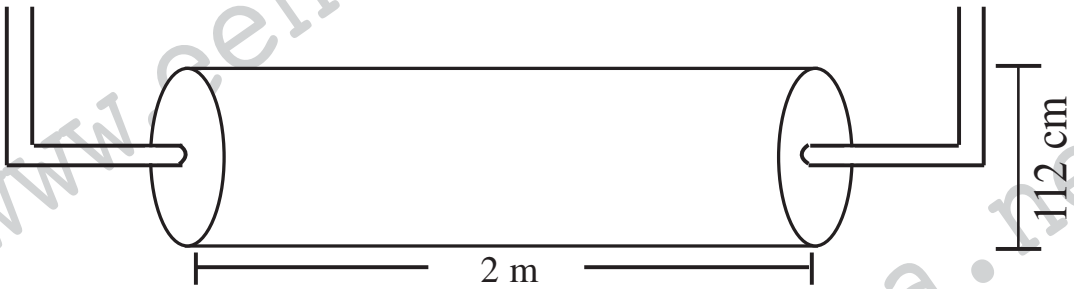
Tenth Maths

Mensuration

In the chapter Mensuration, the combination of two or more solid shapes that you come across in daily life situations have been discussed. To find surface area or volume of these solids, you need to split it into known shapes and apply the formulae accordingly.

In the following model questions the procedure of solving them is given. Try to solve the problems yourself.

1. The diameter of the following roller is 112 cm and it is 2 m long. If it takes 500 complete revolutions to level a playground, determine the cost of levelling it at the rate of 50 paise per square meter.



Procedure: The roller is a right circular cylinder whose length is 2 m and the diameter is 112 cm.

★ Convert the length 2 m into cm. i.e. 200 cm.

★ Find the radius of the roller $r = \frac{112}{2}$ cm

★ Find the curved surface area of the cylindrical roller.

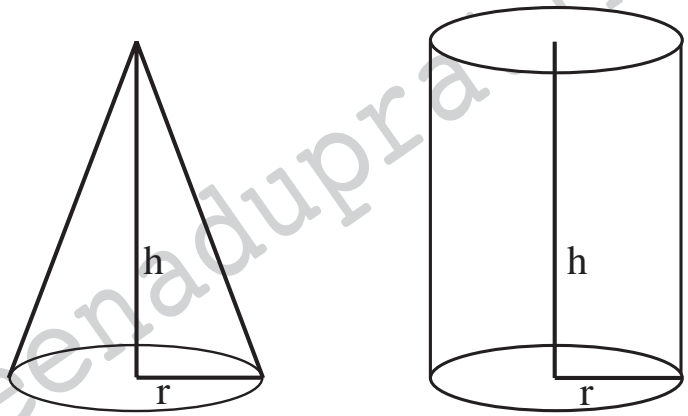
★ $2\pi rh = \left(2 \times \frac{22}{7} \times 56 \times 200\right)$ sq. cm.

★ Find the area covered by the roller in 500 revolutions i.e. 500 × 70400 sq.cm.

★ Convert this area into sq.m $\frac{500 \times 70400}{100 \times 100} = 3520$ sq.m

★ Find the cost of levelling the playground $= 3520 \times \frac{50}{100} = \text{Rs.}1{,}760$

2. Four siblings Padma, Murali, Sunita and Sujata went to an Ice – Cream Parlour to have Ice-cream. They came to know that only two containers of their favourite flavour ice – cream were left in the shop. One container being a right circular cone and the other one a right cylinder, both being of equal heights and equal radii of the base. They thought that they could share equally by sharing the cone between two siblings and the cylinder container ice – cream between the remaining two. Do you think they are sharing the ice – cream equally? Can you suggest a better way?



Procedure: Let the height be 'h' and the radius of the base be 'r' units of the two containers.

★ Write the volumes of the cone and the cylinder.

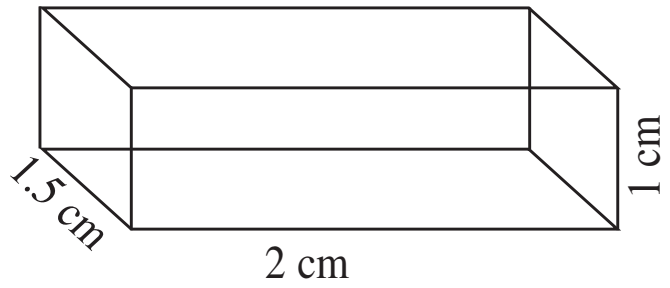
★ Write the ratio of their volumes.

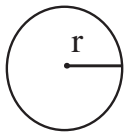
★ As the volumes of the cone and cylinder are in the ratio 1 : 3, you can suggest that one can have the ice – cream in the cone entirely and the other three can share the ice – cream in the cylindrical container making it into three equal parts.

3. A goldsmith plans to make solid spheres of radii 3 mm by melting a cuboidal alloy of gold & copper whose length, breadth and height are respectively 2 cm, 1.5 cm and 1 cm. How many spheres can be made? Is any part of the cuboid left? (Take $\pi = 3.14$ and limit the calculations to 2 place of decimal).

Procedure:

★ When a solid is converted from one shape to another its volume remains the same.





r = 0.3 cm

★ Write the radius of the sphere in cm.

★ Find the volume of the sphere in cubic cm.

★ $V_1 = \frac{4}{3}\pi (0.3)^3$

★ Find the volume of the cuboidal alloy. $V_2 = lbh = 2 \times 1.5 \times 1$ cu cm

★ Find the value of $\frac{V_2}{V_1}$

★ No. of spheres = Integral part of $\frac{V_2}{V_1}$

★ Check whether any decimal part of $\frac{V_2}{V_1}$ is left and write your conclusion.

Whether any part of cuboid is left in the conversion.

Multiple Choice Questions

1. Total surface area of a Hemisphere of radius r is..

A) $2\pi r^2$ B) $3\pi r^2$ C) $4\pi r^2$ D) $\frac{2}{3}\pi r^3$

2. If a cube of side 6 cm is cut into two equal pieces horizontally and three equal pieces vertically, the total surface area of each of the resultant cuboids is...

A) 72 sq.cm B) 36 sq.cm C) 30 sq.cm D) 144 sq.cm

3. The volume of a right pyramid whose area of the base is 25 sq.cm and height 3 cm is...

A) 75 cu cm B) 50 cu cm C) 25 cu cm D) 15 cu cm

Key: 1 – B 2 – A 3 –C

Writer: V. Padma Priya