



Surface Areas and Volumes Ex.16.2 Q19

Answer :

We have to find the outer and inner radius of a hollow pipe.

Radius of inner pipe be (r_1)

Radius of outer cylinder be (r_2)

Length of the cylinder $(h) = 14 \text{ cm}$

Difference between the outer and the inner surface area is 44 cm^2

So,

$$2\pi h(r_2 - r_1) = 44$$

$$2\left(\frac{22}{7}\right)(14)(r_2 - r_1) = 44$$

So,

$$(r_2 - r_1) = \frac{1}{2} \dots\dots (1)$$

So, volume of metal used is 99 cm^3 , so,

$$\pi h(r_2^2 - r_1^2) = 99$$

$$\left(\frac{22}{7}\right)(14)(r_2 - r_1)(r_2 + r_1) = 99$$

Use equation (1) in the above to get,

$$\left(\frac{22}{7}\right)(14)\left(\frac{1}{2}\right)(r_2 + r_1) = 99$$

Therefore,

$$(r_2 + r_1) = \frac{9}{2} \dots\dots (2)$$

Solve equation (1) and (2) to get,

$$\boxed{\begin{array}{l} r_2 = \frac{5}{2} \text{ cm} \\ r_1 = 2 \text{ cm} \end{array}}$$

Surface Areas and Volumes Ex.16.2 Q20

Answer :

We have to find the number of cones which can be filled using the ice cream in the cylindrical vessel.

Radius of the cylinder (r_1) = 6 cm

Height of cylinder (h) = 15 cm

Radius of cone and the hemisphere on it (r_2) = 3 cm

Height of cone (l) = 12 cm

Let 'n' number of cones filled. So we can write it as,

$n(\text{Volume of each cone}) = \text{Volume of cylinder}$

So,

$$(n) \left(\frac{1}{3} \pi r_2^2 l + \frac{2}{3} \pi r_2^3 \right) = \pi r_1^2 h$$

$$(n) \left(\frac{r_2^2 (l + 2r_2)}{3} \right) = r_1^2 h$$

Now put the values to get,

$$(n) \left(\frac{9(12+6)}{3} \right) = 36(15)$$

$$54n = 540$$

Therefore, $\boxed{n=10}$

Surface Areas and Volumes Ex.16.2 Q21

Answer :

We have to find the mass of a pole having a cylindrical base surmounted by a cone.

Radius of cone and cylinder (r) = 6 cm

Height of cylinder (h) = 110 cm

Height of cone (l) = 9 cm

So volume of the pole is,

$$= \pi r^2 h + \frac{1}{3} \pi r^2 l$$

$$= \pi r^2 \left(h + \frac{1}{3} l \right)$$

Put the values to get,

$$= \left(\frac{22}{7} \right) (36) (110 + 3) \text{ cm}^3$$

$$= 12785.14 \text{ cm}^3$$

Mass of 1 cm³ of iron is 8 gm.

Therefore mass of the iron,

$$= (12785.14)(8) \text{ gm}$$

$$= \boxed{102.2 \text{ kg}}$$

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