Surface Area and volume of A Right Circular cone Ex 20.1 Q22

Answer :

The area to be painted is the curved surface area of each cone.
The formula of the curved surface area of a cone with base radius 'r' and slant height 'l' is given as
Curved Surface Area = πrl
For each cone, we're given that the base diameter is 0.40 m.
Hence the base radius $r = 0.20$ m. The vertical height $h = 1$ m.
To find the slant height 'l' to be used in the formula for Curved Surface Area we use the following relation
Slant height,

$l = \sqrt{r^2 + h^2}$
$= \sqrt{0.2^2 + 1^2}$
$= \sqrt{0.04 + 1}$
$= \sqrt{1.04}$
$l = 1.02$ m

Now, substituting the values of $r = 0.2$ m and slant height $l = 1.02$ m and using $\pi = 3.14$ in the formula of C.S.A,
We get Curved Surface Area = $(3.14)(0.2)(1.02)$
$= 0.64056$ m^2
This is the curved surface area of a single cone. Since we need to paint 50 such cones the total area to be painted is,
Total area to be painted = (0.64056) (50)
$= 32.028$ m^2
The cost of painting is given as Rs. 12 per m^2
Hence the total cost of painting = (12) (32.028)
$= 384.336$
Hence, the total cost that would be incurred in painting is $\boxed{\text{Rs. } 384.336}$

Surface Area and volume of A Right Circular cone Ex 20.1 Q23

Answer :

It is given that the base radius and the height of the cone and the cylinder are the same.
So let the base radius of each is 'r' and the vertical height of each is 'h'.
Let the slant height of the cone be 'l'
The curved surface area of the cone = πrl
The curved surface area of the cylinder = $2\pi rh$
It is said that the ratio of the curved surface areas of the cylinder to that of the cone is 8:5
So,

$$\frac{2\pi rh}{\pi rl} = \frac{8}{5}$$
$$\frac{2h}{l} = \frac{8}{5}$$
$$\frac{h}{l} = \frac{4}{5}$$

But we know that $l = \sqrt{r^2 + h^2}$

$$\frac{h}{\sqrt{r^2+h^2}} = \frac{4}{5}$$

Squaring on both sides we get

$$\frac{h^2}{r^2+h^2} = \frac{16}{25}$$

$$\frac{r^2+h^2}{h^2} = \frac{25}{16}$$

$$\frac{r^2}{h^2} + 1 = \frac{25}{16}$$

$$\frac{r^2}{h^2} = \frac{25}{16} - 1$$

$$\frac{r^2}{h^2} = \frac{9}{16}$$

$$\frac{r}{h} = \frac{3}{4}$$

Hence it is shown that the ratio of the radius to the height of the cone as well as the cylinder is

$\boxed{3:4}$

********** END **********