Surface Area and volume of A Right Circular cone Ex 20.2 Q3

Answer :

The formula of the volume of a cone with base radius 'r' and vertical height 'h' is given as

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

Let the base radius and the height of the two cones be r_1, h_1 and r_2, h_2 respectively.

It is given that the ratio between the heights of the two cones is 1: 3.

Since only the ratio is given, to use them in our equation we introduce a constant 'k'.

So, $h_1 = 1k$

$h_2 = 3k$

It is also given that the ratio between the base radiuses of the two cones is 3: 1.

Again, since only the ratio is given, to use them in our equation we introduce another constant 'p'.

So, $r_1 = 3p$

$r_2 = 1p$

Substituting these values in the formula for volume of cone we get,

$$\frac{\text{Volume of cone}_1}{\text{Volume of cone}_2} = \frac{(\pi)(3p)(3p)(1k)(3)}{(3)(\pi)(1p)(1p)(3k)}$$

$$= \frac{3}{1}$$

Hence we see that the ratio between the volumes of the two given cones is $\boxed{3:1}$

Surface Area and volume of A Right Circular cone Ex 20.2 Q4

Answer :

It is given that the ratio between the radius 'r' and the height 'h' of the cone is 5: 12.

Since only the ratio is given, to use them in an equation we introduce a constant 'k'.

So, $r = 5k$

$h = 12k$

The formula of the volume of a cone with base radius 'r' and vertical height 'h' is given as

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

The volume of the cone is given as $314 m^3$

Substituting the values of $r = 5k$ and $h = 12k$ and using $\pi = 3.14$ in the formula for the volume of a cone,

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

$$314 = \frac{(3.14)(5k)(5k)(12k)}{3}$$

$k^3 = 1$

$k = 1$

Therefore the actual value of the base radius is $r = 5$ m and $h = 12$ m.

Hence the radius of the cone is $\boxed{5 \text{ m}}$

We are given that $r = 5$ m and $h = 12$ m. We find l using the relation

$$l^2 = r^2 + h^2$$

$$l = \sqrt{r^2 + h^2}$$

$$= \sqrt{5^2 + 12^2}$$

$$= \sqrt{25 + 144}$$

$$= \sqrt{169}$$

$$= 13.$$

Therefore, the slant height of the given cone is $\boxed{13 \text{ m}}$

Hence the radius of cone and slant height is 5 m and 13 m respectively

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