Surface Area and volume of A Right Circular cone Ex 20.2 Q7

Answer :

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

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

And, the formula of the volume of a cylinder with base radius 'r' and vertical height 'h' is given as

Volume of cylinder $= \pi r^2 h$

Now, substituting these to arrive at the ratio between the volume of a cylinder and the volume of a cone, we get

$$\frac{\text{Volume of cylinder}}{\text{Volume of cone}} = \frac{3\pi r^2 h}{\pi r^2 h}$$

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

Hence it is shown that the ratio between the volumes of a cylinder and a cone with the same base radius and the same height is indeed $\boxed{3:1}$

Surface Area and volume of A Right Circular cone Ex 20.2 Q8

Answer :

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

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

Now, let another cone have the same height, that is 'h', but the base radius of this cone is half that of the previous one we have talked about, that is '$\frac{r}{2}$'

Now,

The volume of this new cone $= \frac{\pi r^2 h}{(3)(2)(2)}$

$$= \frac{\pi r^2 h}{12}$$

Now the ratio between the old cone and the new one would be,

$$\frac{\text{Volume of the new cone}}{\text{Volume of the old cone}} = \frac{3\pi r^2 h}{12\pi r^2 h}$$

$$= \frac{3}{12}$$

$$= \frac{1}{4}$$

Hence the ratio between the volumes of the modified cone and the original cone is $\boxed{1:4}$

Surface Area and volume of A Right Circular cone Ex 20.2 Q9

Answer :

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

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

Here, the diameter is given as 9 m. From this we get the base radius as $r = 4.5$ m.

Substituting the values of $r = 4.5$ m and $h = 3.5$ m in the above equation and using $\pi = 3.14$

Volume $= \frac{(3.14)(4.5)(4.5)(3.5)}{3}$

$$= \frac{222.5475}{3}$$

$$= 74.1825$$

Hence the volume of the given cone with the specified dimensions is $\boxed{74.18\ \text{m}^3}$

The amount of canvas required to cover the conical heap would be equal to the curved surface area of the conical heap.

The formula of the curved surface area of a cone with base radius 'r' and slant height 'l' is given as

Curved Surface Area $= \pi r l$

To find the slant height 'l' to be used in the formula for Curved Surface Area we use the following relation

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

$= \sqrt{4.5^2 + 3.5^2}$

$= \sqrt{20.25 + 12.25}$

$= \sqrt{32.50}$

Hence the slant height l of the conical heap is $\sqrt{32.50}$ m.

Now, substituting the values of $r = 4.5$ m and slant height $l = \sqrt{32.50}$ m and using $\pi = 3.14$ in the formula of C.S.A,

We get Curved Surface Area = $(3.14)(4.5)(\sqrt{32.50})$

$= 80.55$

Hence the amount of canvas required to just cover the heap would be $\boxed{80.55 \text{ m}^2}$

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