Surface Areas and Volumes Ex.16.3 Q7

Answer :

The height of the conical bucket is $h = 24$ cm. The radii of the bottom and top circles are $r_1 = 15$cm and $r_2 = 5$cm respectively.

The slant height of the bucket is

$$l = \sqrt{(r_1 - r_2)^2 + h^2}$$
$$= \sqrt{(15-5)^2 + 24^2}$$
$$= \sqrt{676}$$
$$= 26 \text{ cm}$$

The curved surface area of the bucket is

$$= \pi(r_1 + r_2) \times l + \pi r_2^2$$
$$= \frac{22}{7} \times (15+5) \times 26 + \pi \times 5^2$$
$$= \pi \times 20 \times 26 + 25\pi$$
$$= 545\pi \text{ cm}^2$$

Hence the curved surface area of the bucket is $\boxed{545\pi \text{ cm}^2}$

Surface Areas and Volumes Ex.16.3 Q8

Answer :

The height of the frustum cone is $h = 12$ cm. The radii of the bottom and top circles are $r_1 = 12$cm and $r_2 = 3$cm respectively.

The slant height of the frustum cone is

$$l = \sqrt{(r_1 - r_2)^2 + h^2}$$
$$= \sqrt{(12-3)^2 + 12^2}$$
$$= \sqrt{225}$$
$$= 15 \text{ cm}$$

The total surface area of the frustum cone is

$$= \pi(r_1 + r_2) \times l + \pi r_1^2 + \pi r_2^2$$
$$= \pi \times (12+3) \times 15 + \pi \times 12^2 + \pi \times 3^2$$
$$= \pi \times 225 \times 26 + 144\pi + 9\pi$$
$$= 378\pi \text{ cm}^2$$

Hence $\boxed{\text{Total surface area} = 378\pi \text{ cm}^2}$

The volume of the frustum cone is

$$V = \frac{1}{3}\pi(r_1^2 + r_1 r_2 + r_2^2) \times h$$

$$= \frac{1}{3}\pi(12^2 + 12 \times 3 + 3^2) \times 12$$

$$= \frac{1}{3} \times \pi \times 189 \times 12$$

$$= 756\pi \text{ cm}^3$$

Hence $\boxed{\text{Volume of frustum} = 756\pi \text{ cm}^3}$

Surface Areas and Volumes Ex.16.3 Q9

Answer :

The height of the frustum cone is $h = 8$ m. The radii of the end circles of the frustum are $r_1 = 13$m and $r_2 = 7$m.

The slant height of the frustum cone is

$$l = \sqrt{(r_1 - r_2)^2 + h^2}$$
$$= \sqrt{(13-7)^2 + 8^2}$$
$$= \sqrt{100}$$
$$= 10 \text{ meter}$$

The curved surface area of the frustum is

$$S_1 = \pi(r_1 + r_2) \times l$$
$$= \pi \times (13+7) \times 10$$
$$= \pi \times 20 \times 10$$
$$= 200\pi \text{ m}^2$$

The base-radius of the upper cap cone is 7m and the slant height is 12m. Therefore, the curved surface area of the upper cap cone is

$$S_2 = \pi \times 7 \times 12$$
$$= \frac{22}{7} \times 7 \times 12$$
$$= 22 \times 12$$
$$= 264 \text{ m}^2$$

Hence, the total canvas required for the tent is

$$S_1 + S_2 = 200\pi + 264$$
$$= 892.57 \text{ m}^2$$

Hence total canvas is $\boxed{892.57 \text{ m}^2}$

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