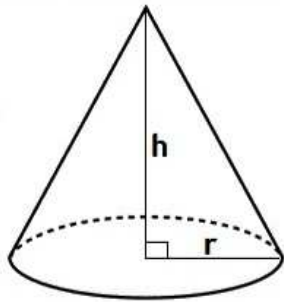


A cone of height 12 cm has curved surface area of 204.1 square cm. Find its volume. Take  $\pi = 3.14$



$$CSA = 204.1 \text{ cm}^2$$

$$\pi r l = 204.1$$

$$3.14 r l = 204.1$$

$$r l = \frac{204.1}{3.14}$$

$$= 65$$

$$l = \frac{65}{r} \dots \textcircled{1}$$

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

$$\left(\frac{65}{r}\right)^2 = r^2 + 12^2$$

$$\frac{4225}{r^2} = r^2 + 144$$

$$4225 = r^4 + 144r^2$$

$$\text{Put } r^2 = x$$

$$x^2 + 144x - 4225 = 0$$

$$x^2 + 169x - 25x - 4225 = 0$$

$$\Rightarrow x(x + 169) - 25(x + 169) = 0$$

$$\Rightarrow (x + 169)(x - 25) = 0$$

$$\Rightarrow x + 169 = 0, \quad x - 25 = 0$$

$$\Rightarrow x = -169, \quad x = 25$$

$$\text{Put } x = r^2$$

$$r^2 = -169, \quad r^2 = 25$$

$$\text{rejected} \Rightarrow r = 5$$

$$\therefore \text{radius} = 5 \text{ cm}$$

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

$$= \frac{1}{3} \times 3.14 \times 5 \times 5 \times 12$$

$$= 314 \text{ cm}^3$$