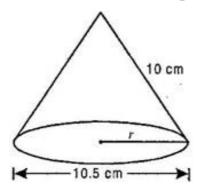


NCERT solutions for class-9 maths surface areas and volumes Ex 13.3

Assume $\pi = \frac{22}{7}$ unless stated otherwise.

Q1. Diameter of the base of a cone is 10.5 cm and its slant height is 10 cm. Find its curved surface area and its total surface area.

Ans: Diameter = 10.5 cm



$$\Rightarrow$$
 Radius $(r) = \frac{10.5}{2} = \frac{21}{4}$ cm

Slant height of cone (l) = 10 cm

Curved surface area of cone= πrl

$$=\frac{22}{7}\times\frac{21}{4}\times10=165$$
 cm²

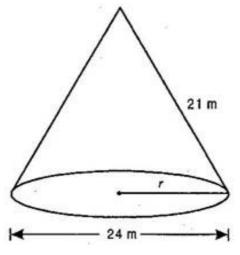
Total surface area of cone = $\pi r(l+r)$

$$= \frac{22}{7} \times \frac{21}{4} \left(10 + \frac{21}{4} \right)$$
$$= \frac{22}{7} \times \frac{21}{4} \times \frac{61}{4} = 251.625 \text{ cm}^2$$

Q2. Find the total surface area of a cone, if its slant height is 21 cm and diameter of the base is 24 cm.

Ans: Slant height of cone (l) = 21 m

Diameter of cone = 24 m



$$\Rightarrow$$
 Radius of cone $(r) = \frac{24}{2} = 12 \text{ m}$

Total surface area of cone = $\pi r(l+r)$

$$=\frac{22}{7}\times12(21+12)$$

$$= \frac{264}{7} \times 33 = 1244.57 \,\mathrm{m}^2$$

Q3. Curved surface area of a cone is 308 cm² and its slant height is 14 cm. Find (i) radius of the base and (ii) total surface area of the cone.

Ans: (i) Slant height of cone (l) = 14 cm

Curved surface area of cone = 308 cm²

$$\Rightarrow \pi rl = 308$$

$$\Rightarrow \frac{22}{7} \times r \times 14 = 308$$

$$\Rightarrow r = \frac{308 \times 7}{14 \times 22}$$

$$\Rightarrow r = 7 \text{ cm}$$

(ii) Total surface area of the cone

= Curved surface area + Area of circular base

$$= 308 + \pi r^2$$

$$=308+\frac{22}{7}\times(7)^2$$

Q4. A conical tent is 10 m high and the radius of its base is 24 m. Find:

- (i) slant height of the tent.
- (ii) cost of the canvas required to make the tent, if the cost of a m² canvas is Rs. 70.

Ans: Height of the conical tent (h) = 10 m

Radius of the conical tent (r) = 24 m

(i) Slant height of the tent $(l) = \sqrt{r^2 + h^2}$

$$= \sqrt{(24)^2 + (10)^2}$$
$$= \sqrt{576 + 100} = \sqrt{676} = 26 \text{ m}$$

- (ii) Canvas required to make the tent
- = Curved surface area of the tent= πrl

$$=\frac{22}{7}\times24\times26=\frac{13728}{7}$$
 m²

∵ Cost of 1 m² canvas = Rs. 70

$$\therefore$$
 Cost of $\frac{13728}{7}$ m² canvas

=
$$70 \times \frac{13728}{7}$$
 = Rs. 137280

Q5. What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6 m? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm. (Use $\pi = 3.14$)

Ans: Height of the conical tent (h) = 8 m and

Radius of the conical tent (r) = 6 m

Slant height of the tent $(l) = \sqrt{r^2 + h^2}$

$$=\sqrt{(6)^2+(8)^2}=\sqrt{36+64}=\sqrt{100}=$$
 10 m

Area of tarpaulin = Curved surface area of tent =

$$\pi r l = 3.14 \text{ x } 6 \text{ x } 10 = 188.4 \text{ m}^2$$

Width of tarpaulin = 3 m

Let Length of tarpaulin = L

∴ Area of tarpaulin = Length x Breadth

$$= L x 3 = 3L$$

Now According to question,

$$3L = 188.4$$

$$\Rightarrow$$
 L = $\frac{1884.4}{3}$ = 62.8 m

The extra length of the material required for stitching margins and cutting is 20 cm = 0.2 m.

So the total length of tarpaulin bought is (62.8 + 0.2) m = 63 m

Q6. The slant height and base diameter of a conical tomb are 25 m and 14 m respectively. Find the cost of whitewashing its curved surface at the rate of Rs. 210 per 100 m².

Ans: Slant height of conical tomb (l)

- = 25 m, Diameter of tomb = 14 m
- \therefore Radius of the tomb $(r) = \frac{14}{2} = 7 \text{ m}$

Curved surface are of tomb = πrl

$$=\frac{22}{7}\times7\times25=550 \text{ m}^2$$

- ∵ Cost of white washing 100 m²
- = Rs. 210
- \therefore Cost of white washing 1 m² = $\frac{210}{100}$
- ... Cost of white washing 550 m2

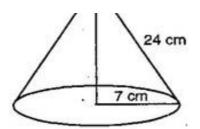
$$= \frac{210}{100} \times 550 =$$
Rs. 1155

Q7. A Joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.

Ans: Radius of cap (r) = 7 cm,

Height of cap (h) = 24 cm





Slant height of the cone $(l) = \sqrt{r^2 + h^2}$

$$=\sqrt{(7)^2+(24)^2}$$

$$=\sqrt{49+576}=\sqrt{625}=25$$
 cm

Area of sheet required to make a cap

= CSA of cone =
$$\pi rl$$

$$=\frac{22}{7}\times7\times25=550 \text{ cm}^2$$

 \therefore Area of sheet required to make 10 caps = 10 x $550 = 5500 \text{ cm}^2$

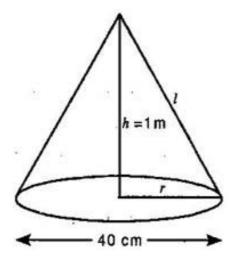
Q8. A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled cardboard. Each cone has a base diameter of 40 cm and height 1 m. If the outer side of each of the cones is to be painted and the cost of painting is Rs. 12 per m², what will be the cost of painting all these cones?

(Use
$$\pi = 3.14$$
 and take $\sqrt{1.04} = 1.02$)

Ans: Diameter of cone = 40 cm

$$\Rightarrow$$
 Radius of cone $(r) = \frac{40}{2} = 20 \text{ cm}$

$$=\frac{20}{100}$$
 m = 0.2 m



Height of cone $(h) = 1 \,\mathrm{m}$

Slant height of cone $(l) = \sqrt{r^2 + h^2}$

$$= \sqrt{(0.2)^2 + (1)^2} = \sqrt{1.04} \,\mathrm{m}$$

Curved surface area of cone = πrl

= 3.14 x 0.2 x
$$\sqrt{1.04}$$

- = 0.64056 m²
- \because Cost of painting 1 m^2 of a cone
- = Rs. 12
- · Cost of painting 0.64056 m² of a cone
- = 12 x 0.64056= Rs. 7.68672
- .. Cost of painting of 50 such cones
- = 50 x 7.68672 = Rs. 384.34 (approx.)

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