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CLASS – 9

MATHEMATICS

Chapter – 11

Surface Areas and Volumes

Part – 5

Exercise 11.1 (Question 5 - 8)

Vikas Saini

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5. 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 $\pi = 3.14$)

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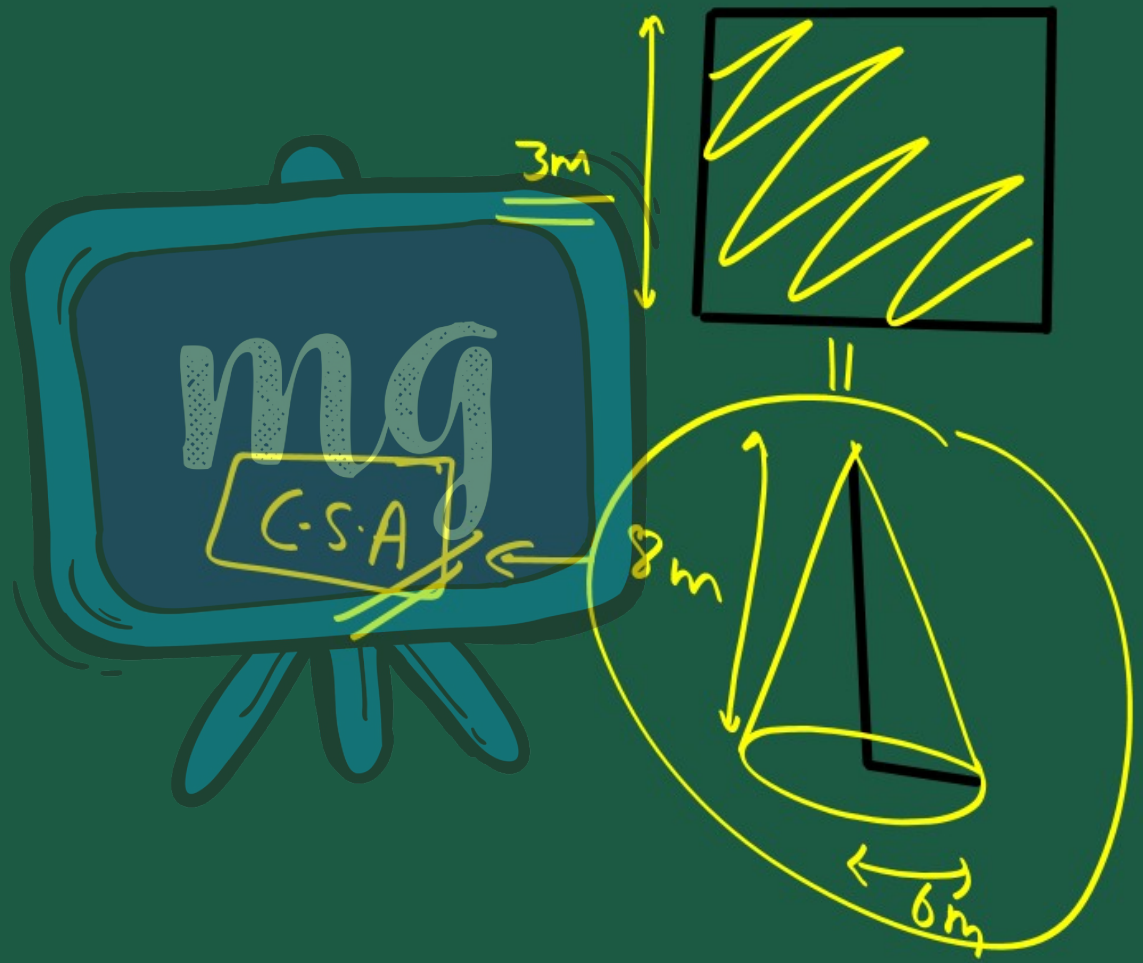

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A.T.Q

width of tarpaulin = 3 m

(h) hieght of conical Tent = 8 m

(r) radius of base of conical Tent = 6 m

Margin = 20 cm = $\frac{2}{10}$ = 0.2 m.

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We know that

$$\text{Slant height}(l) = \sqrt{(\text{height})^2 + (\text{radius})^2}$$



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

$$= \sqrt{(8)^2 + (6)^2}$$

$$= \sqrt{64 + 36} = \sqrt{100}$$

$$l = 10\,m$$

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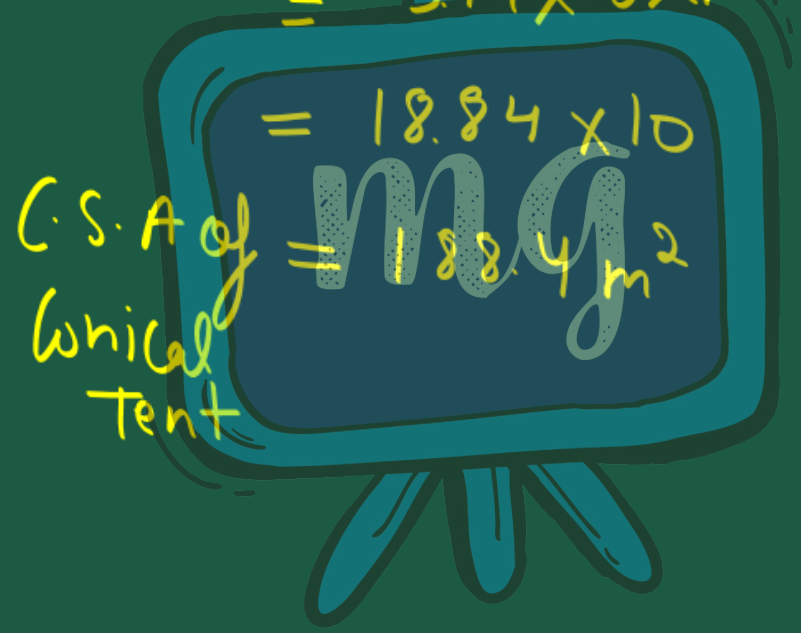
C.S.A of cone = $\pi r l$.

$= 3.14 \times 6 \times 10$

$= 18.84 \times 10$

C.S.A of conical tent $= 188.4\ m^2$



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Now,

Area of Tarpaulin = C.S.A of Conical Tent

$l \times b = 188.4$

$l \times 3 = 188.4$

$l = \frac{188.4}{3} = 62.8\ m.$

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Total length = length Calculated + Margin

= 628 + 0.2

Total length = 628.2 m.

mg

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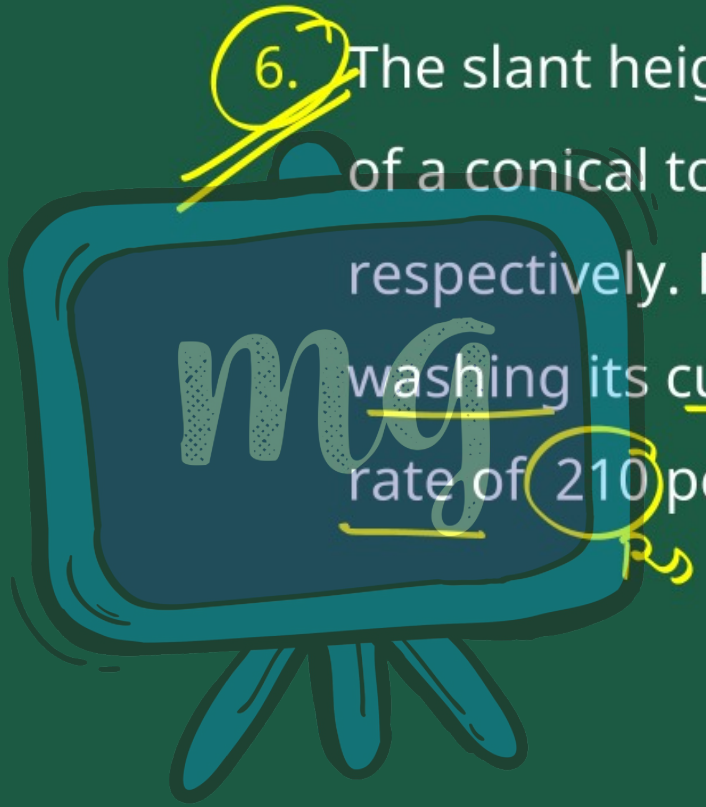

6. The slant height and base diameter of a conical tomb are 25 m and 14 m respectively. Find the cost of white-washing its curved surface at the rate of 210 per 100 m^2.

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A.T.Q

Slant hieght of conical Tomb = 25m

base diameter of conical Tomb = 14



Radius = $\frac{\text{Diameter}}{2} = \frac{14}{2} = 7m$

The cost of white-washing of $100m^2$ = 210 Rs.

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Since we know that

Curved Surface area of cone $= \pi \times r \times l$

$= \frac{22}{7} \times 7 \times 25$

$= 22 \times 25$

$= 11 \times 50 = 550 m^2$

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Since

The cost of white washing of 100 m^2 area = 210 Rs

The cost of white-washing of 1 m^2 area = $\frac{210}{100}$

The cost of white-washing of 550 m^2 area =

$= 550 \times \frac{210}{100}$

$= 21 \times 55$

$= 105 \times 11 = 1155$ Rs

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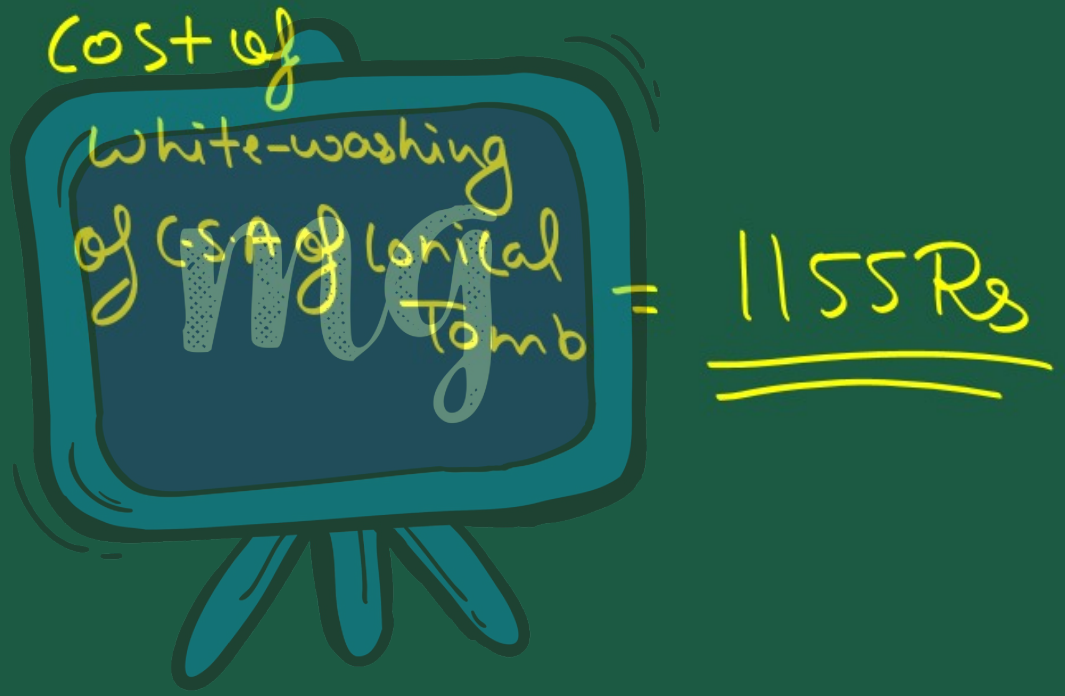

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7. A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.



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A·T·Q

hieght of Cap = 24cm

Radius of Cap = 7cm.

now,

C·S·A of Conical Cap = $\pi \times r \times l$

$= \frac{22}{7} \times 7 \times l$.

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Now,

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

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

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

$$l = 25 \text{ cm}$$

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C.S.A of Cap = $\pi \times r \times l$

$= \frac{22}{7} \times 7 \times 25$

$= 22 \times 25$

$= 550 \text{ (m}^2\text{)}$

The C.S.A of 1 Conical Cap = The amount area of sheet Required to make 1 Cap

$550 \text{ (m}^2\text{)}$ =

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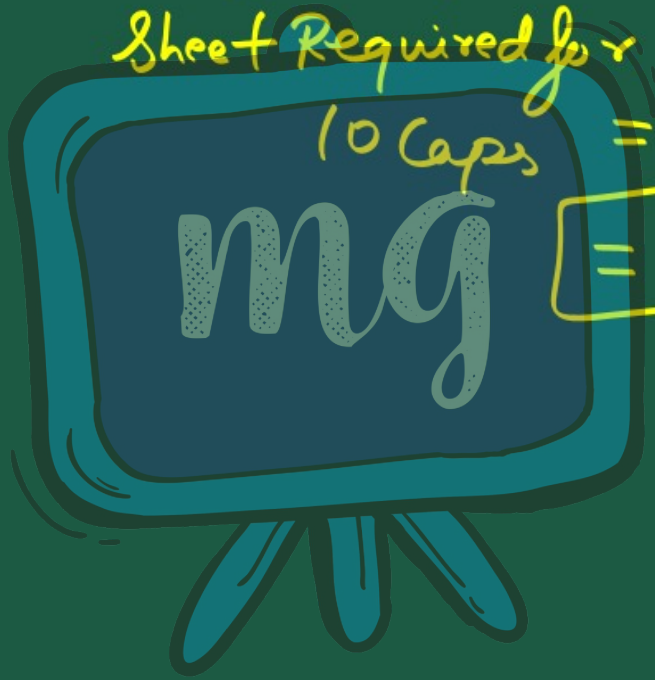
The amount of area of Sheet Required for 10 Caps = 10×550

$= 5500 \text{ cm}^2$

Ans



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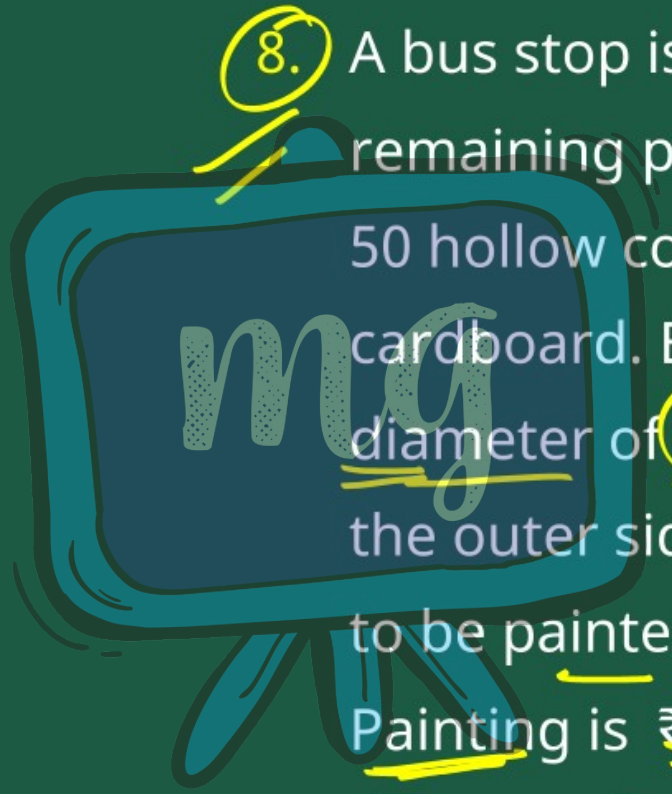

8. A bus stop is barricaded from the remaining part of the road, by using 50 hollow cones made of recycled cardboard. Each cone has a base diameter of 40 cm and height 1 m. If the outer side of each of the cones is to be painted and the cost of Painting is ₹12 per m^2, what will be the cost of painting all these cones? (Use $\pi = 3.14$ and take $\sqrt{1.04} = 1.02$)

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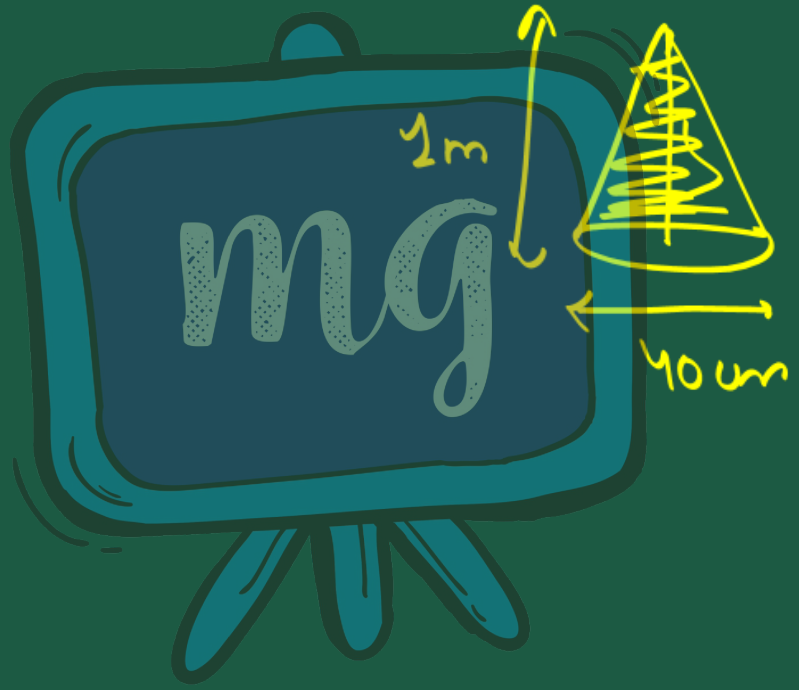

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A-TQ

base diameter of cone = 40cm

So, Radius = 20 cm = $\frac{20}{100}$ m = 0.2 m.

& hieght of cone = 1 m.

The cost of painting of 1 m^2 = 12 Rs

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Now,

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

$$l = \sqrt{(1)^2 + (0.2)^2}$$

$$= \sqrt{1 + 0.04}$$

$$l = \sqrt{1.04}$$

$$l = 1.02 \text{ m}$$

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C.S.A of one lone = $\pi \times r \times l$

$= 3.14 \times 0.2 \times 1.02$

$= 0.628 \times 1.02$

$= 0.64046\ m^2$

The C.S.A of 50 (ones) $= 50 \times 0.64046$

$= 32.028\ m^2$

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The area required to paint = 32.028 m^2



The cost of painting 1 m^2 area = 12 Rs

The cost of painting 32.028 m^2 area = 12 × 32.028

= 384.34 Rs