

## Exercise - 7.2

- ① Find the total surface Area and Lateral surface Area of a cuboid whose dimensions are length = 20 cm, breadth = 15 cm and height = 8 cm.

⇒ Given that

$$l = 20 \text{ cm}, \quad b = 15 \text{ cm} \quad \text{and} \quad h = 8 \text{ cm}.$$

Lateral Surface Area (LSA) of cuboid

$$= 2(l+b) \times h \text{ sq. units}$$

$$= 2(20+15) \times 8 \text{ cm}^2$$

$$= 2 \times 35 \times 8 \text{ cm}^2$$

$$= 560 \text{ cm}^2$$

Total Surface Area (T.S.A) of cuboid

$$= 2(lb + bh + lh) \text{ sq. units.}$$

$$= 2(20 \times 15 + 15 \times 8 + 8 \times 20) \text{ cm}^2$$

$$= 2(300 + 120 + 160) \text{ cm}^2$$

$$= 2 \times 580 \text{ cm}^2$$

$$= 1160 \text{ cm}^2$$

Therefore the total surface Area and Lateral surface Area of the cuboid are  $1160 \text{ cm}^2$  and  $560 \text{ cm}^2$ .

- ② The dimensions of a cuboidal box are  $6 \text{ m} \times 400 \text{ cm} \times 1.5 \text{ m}$ . Find the cost of painting its entire outer surface at the rate of ₹ 22 per  $\text{m}^2$ .

⇒ Given the cuboid box

$$\text{length } (l) = 6 \text{ m}$$

$$\text{breadth } (b) = 400 \text{ cm} = 4 \text{ m}$$

$$\text{height } (h) = 1.5 \text{ m}.$$

Total Surface Area of cuboid

$$= 2(lb + bh + hl) \text{ sq. units.}$$

$$= 2 (6 \times 4 + 4 \times 1.5 + 1.5 \times 6) \text{ m}^2$$

$$= 2 (24 + 6 + 9) \text{ m}^2$$

$$= 2 \times 39 \text{ m}^2$$

$$= 78 \text{ m}^2$$

Cost of per  $\text{m}^2$  is ~~78~~ ₹ 22

$$\text{then total cost} = 22 \times 78 \\ = 1716.$$

Thus, the cost of painting its entire outer surface is ₹ 1716.

③ The dimensions of a hall is  $10 \text{ m} \times 9 \text{ m} \times 8 \text{ m}$ . Find the cost of white washing the walls and ceiling at the rate of ₹ 8.50 per  $\text{m}^2$ .

⇒ Given that the hall:

$$\text{Length } (l) = 10 \text{ m}$$

$$\text{breadth } (b) = 9 \text{ m}$$

$$\text{height } (h) = 8 \text{ m}.$$

∴ Lateral surface Area of hall

$$= 2(l+b) \times h \text{ sq. units.}$$

$$= 2(10+9) \times 8 \text{ m}^2$$

$$= 2 \times 152 \text{ m}^2$$

$$= 304 \text{ m}^2$$

∴ ceiling Area of hall

$$= l \times b \text{ sq. units}$$

$$= 10 \times 9 \text{ m}^2$$

$$= 90 \text{ m}^2$$

$$\begin{aligned} \text{Area of white washing the walls} \\ &= (304 + 90) \text{ m}^2 \\ &= 394 \text{ m}^2 \end{aligned}$$

Given the cost of rate is ~~is~~ per  $\text{m}^2$  is ₹ 8.50.  
 then total cost of white washing the walls  
 $\text{₹ } = 8.50 \times 394$   
 $= 3349$

④ Find the TSA and LSA of the cube whose side is (i) 8m (ii) 21cm (iii) 7.5cm.

⇒ (i) Given the side of cube is ~~= 8m~~  $(a) = 8\text{m}$

$$\begin{aligned} \text{T.S.A of cube} &= 6a^2 = 6 \times 64 \text{ m}^2 \\ &= 384 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{L.S.A of cube} &= 4a^2 = 4 \times 64 \text{ m}^2 \\ &= 256 \text{ m}^2 \end{aligned}$$

(ii) Given the side of cube is  $(a) = 21\text{cm}$

$$\begin{aligned} \text{T.S.A of cube} &= 6a^2 = 6 \times 21 \times 21 \text{ cm}^2 \\ &= 2646 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{L.S.A of cube} &= 4a^2 = 4 \times 21 \times 21 \text{ cm}^2 \\ &= 1764 \text{ cm}^2 \end{aligned}$$

(iii) Given that the side of cube is  $(a) = 7.5\text{cm}$ .

$$\begin{aligned} \text{T.S.A of cube} &= 6a^2 = 6 \times 7.5 \times 7.5 \text{ cm}^2 \\ &= 337.5 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{L.S.A of cube} &= 4a^2 = 4 \times 7.5 \times 7.5 \text{ cm}^2 \\ &= 225 \text{ cm}^2 \end{aligned}$$

5) If the total surface area of a cube is  $2400 \text{ cm}^2$  then, find its lateral surface area.

⇒ Let the side of cube =  $a \text{ cm}$   
then given,

$$T.S.A = 2400$$

$$6a^2 = 2400$$

$$a^2 = 400$$

$$a = 20 \text{ cm.}$$

$$\begin{aligned} \text{Thus, Lateral surface area (L.S.A)} &= 4a^2 \\ &= 4 \times 20 \times 20 \text{ cm}^2 \\ &= 1600 \text{ cm}^2 \end{aligned}$$

6) A cubical container of side  $6.5 \text{ m}$  is to be painted on the entire outer surface, find the area to be painted and total cost of painting it at the rate of ₹ 24 per  $\text{m}^2$ .

⇒ given the side of cube ( $a$ ) =  $6.5 \text{ m}$ .

$$\begin{aligned} T.S.A \text{ of cube} &= 6a^2 = 6 \times 6.5 \times 6.5 \text{ m}^2 \\ &= 253.50 \text{ m}^2 \end{aligned}$$

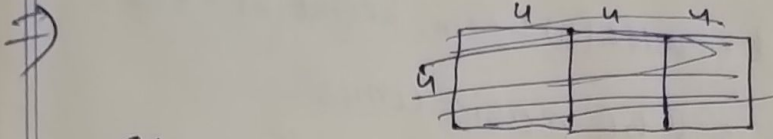
given the rate of painting per  $\text{m}^2$  is ₹ 24.

then total cost of painting of the cube  
to the entire outer surface

$$= 253.50 \times 24$$

$$= 6084.$$

7) Three identical cubes of side 4 cm are joined end to end. Find the total surface area and lateral surface area of the new resulting cuboid.



Given that three identical cubes are joined end to end.

then new cuboid length ( $l$ ) =  $\frac{4+4+4}{\cancel{3+3+3}}$  cm  
 $= 12$  cm

" " breadth ( $b$ ) = 4 cm

" " height ( $h$ ) = 4 cm

$$\begin{aligned} \text{T.S.A of new cuboid} &= 2(lb + bh + hl) \text{ sq. units} \\ &= 2(48 + 16 + 48) \text{ cm}^2 \\ &= 224 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{L.S.A of new cuboid} &= 2(l+b) \times h \text{ sq. units} \\ &= 2(12+4) \times 4 \text{ cm}^2 \\ &= 2 \times 16 \times 4 \text{ cm}^2 \\ &= 128 \text{ cm}^2 \end{aligned}$$

Therefore the new cuboid T.S.A and L.S.A are 224 cm<sup>2</sup> and 128 cm<sup>2</sup>.