



Surface Areas and Volume of a Cuboid and Cube Ex 18.1 Q14

Answer :

The external dimensions of the wooden box,

$$\text{Length } (L) = 1.48 \text{ m}$$

Breadth $(B) = 1.16 \text{ m}$ and height is

$$\begin{aligned} (H) &= 8.3 \text{ dm} \\ &= 0.83 \text{ m} \end{aligned}$$

Thickness of the wood $(t) = 3 \text{ cm}$

$$= 0.03 \text{ m}$$

We are asked to find the cost of painting

So, the internal dimensions of the box are,

$$\text{Length } (l) = L - 2t$$

$$= 1.48 - 2(0.03)$$

$$= 1.48 - 0.06$$

$$= 1.42 \text{ m}$$

$$\text{Breadth } (b) = B - 2t$$

$$= 1.16 - 2(0.03)$$

$$= 1.16 - 0.06$$

$$= 1.10 \text{ m}$$

$$\text{Height } (h) = H - t \quad \{\text{Box is open}\}$$

$$= 0.83 - 0.03$$

$$= 0.83 - 0.03$$

$$= 0.80 \text{ m}$$

The internal surface area of the box,

$$A = 2(lb + bh + hl) - lb \quad \{\text{Box is open}\}$$

$$= lb + 2h(b + l)$$

$$= 1.42 \times 1.10 + 2(0.80)(1.42 + 1.10)$$

$$= 1.562 + 1.6 \times 2.52$$

$$= 1.562 + 4.032$$

$$= 5.594 \text{ m}^2$$

We are given the rate of painting per square meter is *Rs.50*

So the total cost of painting is,

$$= R \times A$$

$$= 50 \times 5.594$$

$$= \text{Rs.}(279.70)$$

The total cost of painting is $\boxed{\text{Rs.}(279.70)}$.

Answer :

We have,

Cost of matting the floor (C_1) = Rs.91.60

Rate of matting per square meter (R_1) = 85 paise/ m^2
= Rs.0.85/ m^2

Length of the floor (l) = 12 m

Let,

$A_1 \rightarrow$ Area of the floor

$b \rightarrow$ Width of the room

So,

$$\begin{aligned}C_1 &= A_1 \times R_1 \\&= (l \times b) \times R_1\end{aligned}$$

$$91.80 = (12b) \times (0.85)$$

$$b = \frac{91.80}{12 \times 0.85}$$

$$= \frac{7.6}{0.85}$$

$$= \frac{760}{85}$$

$$= 8.94 \text{ m}$$

Now, we have,

The cost of preparing the walls (C_2) = Rs.340.20

The rate of preparing the walls (R_2) = Rs.1.35/ m^2

Let,

$A_2 \rightarrow$ Lateral surface area of the room

$h \rightarrow$ Height of the room

So,

$$C_2 = A_2 \times R_2$$

$$340.20 = 2(l + b)h \times 1.35 \quad \{A_2 = 2(l + b)h\}$$

$$= 2(12 + 8.94)h \times 1.35$$

$$= (2.7)(20.94)h$$

$$h = \frac{340.20}{(2.7)(20.94)}$$

$$= \frac{126}{20.94}$$

$$= 6 \text{ m}$$

Hence, height of the room is 6 m.

*****END*****