



Surface Areas and Volume of a Cuboid and Cube Ex 18.2 Q17

Answer :

External dimensions of the closed wooden box,

$$\text{Length } (L) = 48 \text{ cm}$$

$$\text{Breath } (B) = 36 \text{ cm}$$

$$\text{Height } (H) = 30 \text{ cm}$$

$$\text{Thickness of the wood } (t) = 1.5 \text{ cm}$$

We need to find number of bricks that can be put inside the box of dimension $6 \text{ cm} \times 3 \text{ cm} \times 0.75 \text{ cm}$

Internal dimensions of the box,

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

$$= 48 - 2 \times 1.5$$

$$= 48 - 3$$

$$= 45 \text{ cm}$$

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

$$= 36 - 2 \times 1.5$$

$$= 36 - 3$$

$$= 33 \text{ cm}$$

$$\text{Height } (h) = H - 2t$$

$$= 30 - 2 \times 1.5$$

$$= 30 - 3$$

$$= 27 \text{ cm}$$

Capacity of the box,

$$\begin{aligned} V &= lbh \\ &= (45 \times 33 \times 27) \text{ cm}^3 \end{aligned}$$

Volume of each brick,

$$v = (6 \times 3 \times 0.75) \text{ cm}^3$$

Number of bricks that can be put in the box,

$$\begin{aligned} &= \frac{45 \times 33 \times 27}{6 \times 3 \times 0.75} \\ &= \frac{15 \times 33 \times 9}{6 \times 0.75} \\ &= \frac{45 \times 11 \times 9}{2 \times 0.75} \\ &= \frac{45 \times 11 \times 9}{1.5} \\ &= 30 \times 11 \times 9 \\ &= 2970 \end{aligned}$$

The box can contain maximum **2970** bricks.

Surface Areas and Volume of a Cuboid and Cube Ex 18.2 Q18

Answer :

We have,

External dimensions of the iron box are,

$$\text{Length}(L) = 36 \text{ cm}$$

$$\text{Breadth}(B) = 25 \text{ cm}$$

$$\text{Height}(H) = 16.5 \text{ cm}$$

Thickness of iron(t) = 1.5 cm and 1 cm^3 of iron weighs 15 g

We are asked to find the volume of the metal used in the box and weight of the empty box

Internal dimensions of the box,

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

$$= 36 - 2 \times 1.5$$

$$= 33 \text{ cm}$$

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

$$= 25 - 2 \times 1.5$$

$$= 22 \text{ cm}$$

$$\text{Height}(h) = H - t$$

$$= 16.5 - 1.5$$

$$= 15 \text{ cm}$$

Let,

$V \rightarrow$ External volume of the box

$v \rightarrow$ Internal volume of the box

$V' \rightarrow$ Volume of the iron

So,

$$V' = V - v$$

$$= (L \times B \times H) - lbh$$

$$= (36 \times 25 \times 16.5) - (33 \times 22 \times 15)$$

$$= 14850 - 10890$$

$$= 3960 \text{ cm}^3$$

We have, 1 cm^3 of iron weighs 15 g ,

So, weight of 3960 cm^3 of iron,

$$= 3960 \times 15 \text{ g}$$

$$= 59400 \text{ g}$$

$$= 59.4 \text{ kg}$$

In that open box, there are 3960 cm^3 of iron, and weight of the empty box is 59.4 kg .

***** END *****