Surface Areas and Volume of a Cuboid and Cube Ex 18.2 Q15

Answer :

We are given that 1 cubic cm of marble weighs 0.25 kg

Let,

$V \rightarrow$ Volume of the block

$l \rightarrow$ Length of the block

We have,

Width of the block $(b) = 28\,\text{cm}$

Thickness of the block $(h) = 5\,\text{cm}$

Weight of the block $(w) = 112\,\text{kg}$

We need to find the length of the block

We have, $0.25\,\text{kg}$ of marble occupies $1\,\text{cm}^3$ of volume.

So, $112\,\text{kg}$ of marble will occupy the volume,

$$V = \left(\frac{112}{0.25}\right)\text{cm}^3$$

$$lbh = \frac{112}{0.25}$$

$$l(28\times 5) = \frac{112}{0.25}$$

$$l = \frac{112}{0.25\times 28\times 5}$$

$$= \frac{4}{0.25\times 5}$$

$$= \frac{16}{5}$$

$$= 3.2\,\text{cm}$$

The length of the block is $\boxed{3.2\,\text{cm}}$.

Surface Areas and Volume of a Cuboid and Cube Ex 18.2 Q16

Answer :

External dimensions of the box are,

$\text{Length}(L) = 25\,\text{cm}$

$\text{Breadth}(B) = 18\,\text{cm}$

$\text{Height}(H) = 15\,\text{cm}$

$\text{Thickness of the wood}(t) = 2\,\text{cm}$

We need to find the volume used

So, internal dimensions of the box are,

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

$= 25 - 2 \times 2$

$= 25 - 4$

$= 21\,\text{cm}$

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

$= 18 - 2 \times 2$

$= 18 - 4$

$= 14\,\text{cm}$

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

$= 15 - 2 \times 2$

$= 15 - 4$

$= 11\,\text{cm}$

Capacity of the box,

$$V = lbh$$
$$= 21 \times 14 \times 11$$
$$= 3234\,\text{cm}^3$$

Volume of the wood,

$$= L \times B \times H - V$$
$$= 25 \times 18 \times 15 - 3234$$
$$= 6750 - 3234$$
$$= 3516\,\text{cm}^3$$

Maximum $\boxed{3234\,\text{cm}^3}$ of liquid can be placed in the box.

Volume of the wood used in the box is $\boxed{3516\,\text{cm}^3}$.

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