



Surface Areas and Volume of a Cuboid and Cube Ex 18.2 Q4

**Answer :**

We have,

$V \rightarrow$  Volume of the cuboid

$S \rightarrow$  Surface area of the cuboid

$a, b, c \rightarrow$  Dimensions of the cuboid

We need to prove,  $\frac{1}{V} = \left(\frac{2}{S}\right)\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$

We know that,

$$S = 2(ab + bc + ca)$$

And

$$V = abc$$

$$\frac{1}{V} = \frac{1}{abc}$$

$$= \frac{S}{S(abc)}$$

$$= \frac{2(ab + bc + ca)}{S(abc)} \quad \{\text{Since, } S = 2(ab + bc + ca)\}$$

$$= \left(\frac{2}{S}\right)\left(\frac{ab}{abc} + \frac{bc}{abc} + \frac{ca}{abc}\right)$$

$$= \left(\frac{2}{S}\right)\left(\frac{1}{c} + \frac{1}{a} + \frac{1}{b}\right)$$

$$= \left(\frac{2}{S}\right)\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$$

Hence,

$$\boxed{\frac{1}{V} = \left(\frac{2}{S}\right)\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)}$$

Surface Areas and Volume of a Cuboid and Cube Ex 18.2 Q5

**Answer :**

Let,

$l \rightarrow$  Length of the cuboid

$b \rightarrow$  Breadth of the cuboid

$h \rightarrow$  Height of the cuboid

$V \rightarrow$  Volume of the cuboid

$x, y, z \rightarrow$  Areas of three adjacent faces of the cuboid

We know that, areas of three adjacent faces of the cuboid are  $lb$ ,  $bh$ , and  $hl$  respectively

Hence,

$$\begin{aligned}xyz &= (lb)(bh)(hl) \\&= (lbh)(lbh) \\&= (lbh)^2 \\&= V^2 \qquad \qquad \{ \text{as, } V = (lbh) \}\end{aligned}$$

Hence,

$$\boxed{V^2 = xyz}$$

\*\*\*\*\* END \*\*\*\*\*