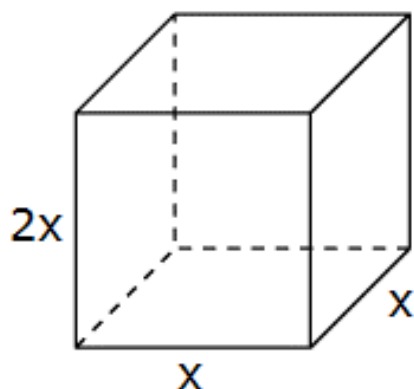


Answer on Question #61611 – Math – Geometry

Question

How many square inches of a material is needed to create an open top rectangular solid whose volume is 54 cubic inches? Assume that the length and width are of the same measurement and that the height is twice the length.

Solution



Assume that length = x inches.
Then width = x inches, height = $2x$ inches.
Volume = length \cdot width \cdot height, hence

$$x \cdot x \cdot 2x = 54$$

$$x^3 = \frac{54}{2}$$

$$x = \sqrt[3]{27} = 3 \text{ (inches)}$$

$$S = x \cdot x + 2 \cdot x \cdot 2x + 2 \cdot x \cdot 2x = 9x^2$$

$$S = 9 \cdot 3^2 = 81 \text{ ((inch)}^2\text{)}$$

Answer: 81 square inches of a material is needed to create an open top rectangular solid.