Answer on Question #57867 – Math – Geometry
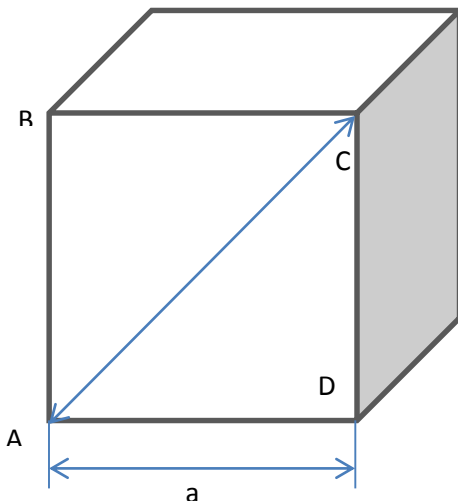
Question

Find the volume of a regular hexahedron if one of the diagonals of its faces is 8 square root 2 inches.

Solution

Volume = V.

A cube is a regular hexahedron. If length of cube's edge is a, then volume will be $V = a^3$.

Triangle ΔABC is right and AB=BC=a. AC is a diagonal of a cube face and the hypotenuse of ΔABC.

By Pythagorean theorem: $AB^2 + BC^2 = AC^2 \rightarrow 2*a^2 = \left(8\sqrt{2}\right)^2 = 64*2 \rightarrow a^2 = 64$

$a = \sqrt{64} = 8$

$$V = a^3 = 8^3 = 512$$

Answer: $V = 512$ **cubic inches.**