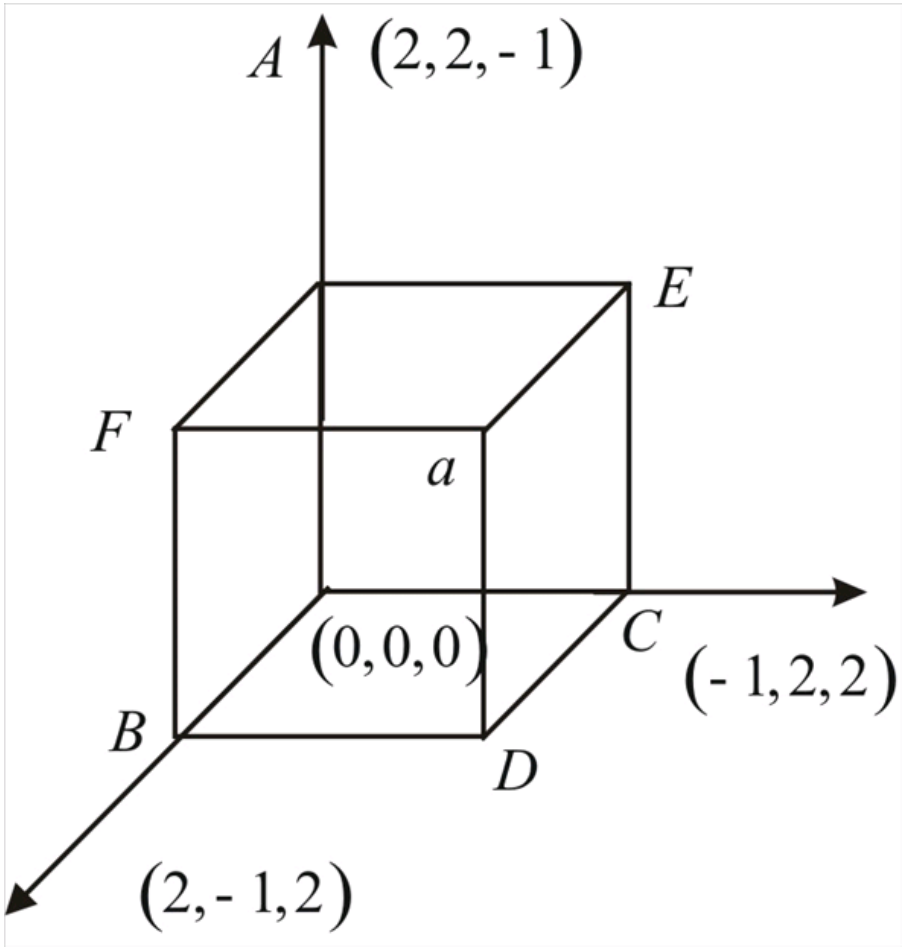
Step-1

Graph of a parallelepiped with four vertices



Step-2

Volume of parallelepiped with given vertices

$$= \text{mod} \begin{vmatrix} 2 & 2 & -1 \\ 2 & -1 & 2 \\ -1 & 2 & 2 \end{vmatrix}$$

$= \left|2(-2-4)-2(4+2)-(4-1)\right|$

$= \left|-12-12-3\right|$

$= 27$ cubic units

Step-3

The other vertices lie in the following way

D in the plane $\overrightarrow{BOC}$

D in the plane $\overrightarrow{AOC}$

F in the plane $\overrightarrow{BOA}$

And G is intersection point of above mentioned three planes.