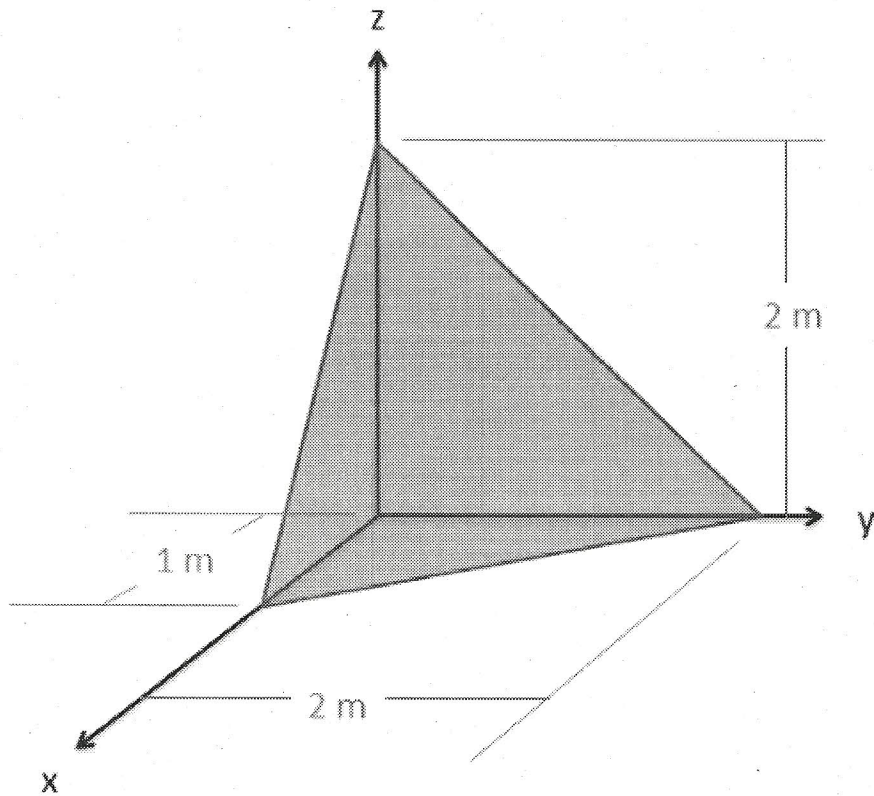


Question 2:

Find the \bar{y} coordinate for the center of mass for the tetrahedron shown in the image below. (The fourth vertex is at the origin)



$$\bar{y} = \frac{\int (dV)(y)}{V} = \int_0^2$$

$$dV = \frac{1}{2} b h \quad h = -y + 2$$

$$b = -\frac{1}{2}y + 1$$

$$\bar{Y} = \frac{\int_0^2 \left(\frac{1}{2}\left(-\frac{1}{2}y+1\right)(-y+2)(y)\right)}{\frac{(2)(2)(1)}{6}}$$

$$\bar{Y} = \frac{\int_0^2 \frac{1}{4}y^3 - y^2 + y}{\frac{2}{3}} = \frac{\int_0^2 \left(\frac{1}{16}y^4 - \frac{1}{3}y^3 + \frac{1}{2}y^2\right)}{\frac{2}{3}}$$

$$\bar{Y} = \frac{.333}{.667}$$

$$\bar{Y} = .5m$$

Solution

$$\bar{Y} = .5m$$