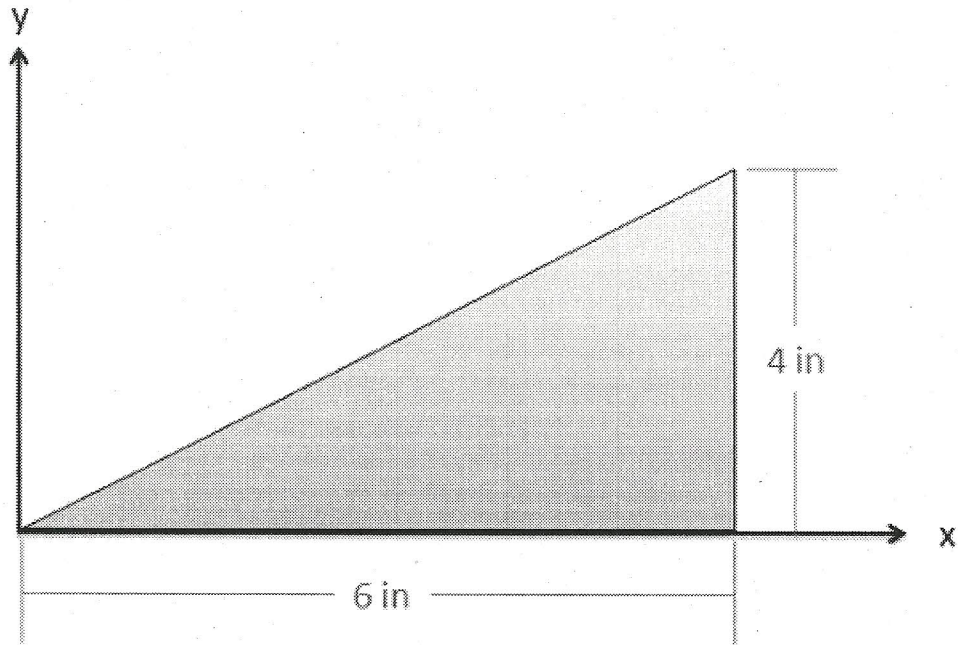


Question 1:

Find the x and y coordinates of the centroid of the shape shown below.



Calculations

$$\bar{X} = \frac{\int_{x_{\min}}^{x_{\max}} (dA)(x)}{\text{Area}} = \frac{\int_0^6 \left(\frac{2}{3}x\right)(x) dx}{\frac{1}{2}(6)(4)}$$

$$\bar{X} = \frac{\int_0^6 \frac{2}{9}x^3}{12} = \frac{\frac{2}{9}(6)^3 - 0}{12}$$

$$\bar{X} = 4 \text{ in}$$

$$\bar{y} = \frac{\int_{y_{\min}}^{y_{\max}} (dA)(y)}{\text{Area}} = \frac{\int_0^4 \left(-\frac{3}{2}y + 6\right)(y)}{12}$$

$$\bar{y} = \frac{\int_0^4 -\frac{1}{2}y^3 + 3y^2}{12} = \frac{\left(-\frac{1}{2}(4)^3 + 3(4)^2\right) - (0)}{12}$$

$$\bar{y} = \frac{4}{3} \text{ m}$$

Solution

$$\bar{x} = 4 \text{ m} \quad \bar{y} = \frac{4}{3} \text{ m}$$