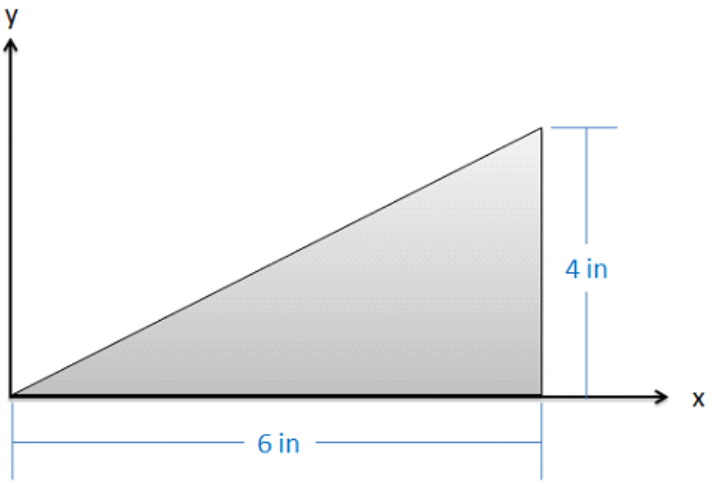
# Question 1

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




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

$$\bar{X} = \frac{\left|_0^6 \left(\frac{2}{9}x^3\right)\right.}{12} = \frac{\frac{2}{9}(6)^3 - \frac{2}{9}(0)^3}{12} = 4 \text{ in}$$

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

$$\bar{Y} = \frac{\left|_0^4 \left(-\frac{1}{2}y^3 + 3y^2\right)\right.}{12} = \frac{\left(-\frac{1}{2}(4)^3 + 3(4)^2\right) - (0)}{12} = \frac{4}{3} \text{ in}$$

Centroid at $\left(4, \frac{4}{3}\right)$ in