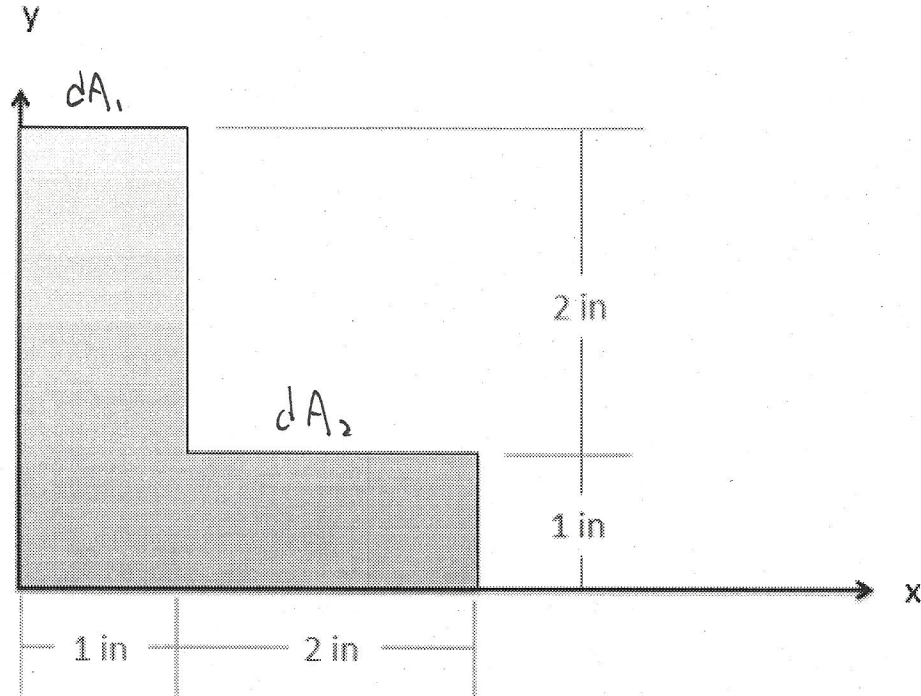


Question 3:

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



Calculations:

$$\bar{X} = \frac{\int_0^1 (3)(x) + \int_1^3 (1)(x)}{\text{Area}} = \frac{\int_0^1 3x + \int_1^3 x}{5 \text{ in}^2}$$

$$\bar{X} = \frac{\int_0^1 \frac{3}{2}x^2 + \int_1^3 \frac{1}{2}x^2}{5}$$

$$\bar{X} = \frac{\left(\frac{3}{2}(1)^2 - (0) + \left(\frac{1}{2}(3)^2\right) - \left(\frac{1}{2}(1)^2\right)\right)}{5}$$

$$\bar{X} = 1.1 \text{ m}$$

$$\bar{Y} = \frac{\int_0^1 (3)(y) + \int_1^3 (1)(y)}{\text{Area}} = \frac{\int_0^1 3y + \int_1^3 y}{5}$$

$$\bar{Y} = \frac{\int_0^1 \frac{3}{2} y^2 + \int_1^3 \frac{1}{2} y^2}{5}$$

$$\bar{Y} = \frac{\left(\frac{3}{2}(1)^2\right) - (0) + \left(\frac{1}{2}(3)^2\right) - \left(\frac{1}{2}(1)^2\right)}{5}$$

$$\bar{Y} = 1.1 \text{ m}$$

Solution

$$\bar{X} = 1.1 \text{ m} \quad \bar{Y} = 1.1 \text{ m}$$