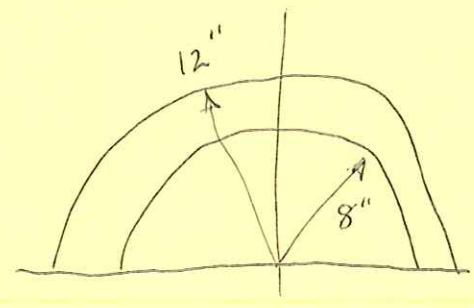
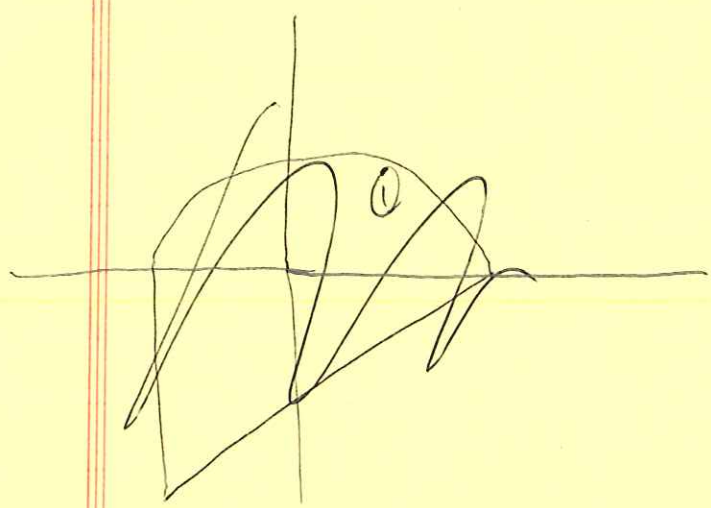


EXAMPLE PROB. 5.10

Given: Schematic  
Find: Centroid.



OUTER SEMICIRCULAR AREA:

$$\bar{x}_1 = 0$$

$$\bar{y}_1 = \frac{4r}{3\pi} = \frac{4}{3\pi}(12 \text{ in}) = 5.09 \text{ in}$$

$$A_1 = \frac{\pi r^2}{2} = \frac{\pi}{2}(12 \text{ in})^2 = 226 \text{ in}^2$$

$$\bar{x}_1 A_1 = 0$$

$$\bar{y}_1 A_1 = 1150 \text{ in}^3$$

INNER SEMICIRCULAR AREA:

$$\bar{x}_2 = 0$$

$$\bar{y}_2 = \frac{4r}{3\pi} = \frac{4}{3\pi}(8 \text{ in}) = 3.39 \text{ in}$$

$$A_2 = -\left(\frac{\pi r^2}{2}\right) = -\frac{\pi}{2}(8 \text{ in})^2 = -100. \text{ in}^2$$

$$A \bar{X}_2 A_2 = 0$$

$$\bar{Y}_2 A_2 = (3.39)(-100) = -339 \text{ in}^3$$

$$\bar{X} = \frac{\sum \bar{X}_i A_i}{\sum A_i} = 0$$

$$\bar{Y} = \frac{\sum \bar{Y}_i A_i}{\sum A_i} = \frac{(1150) + (-339)}{(226) + (-100)}$$

$$\bar{Y} = 6.44 \text{ in}$$

IN-CLASS HOMEWORK #6: PROB. 5.3