# Problema sobre centroides,

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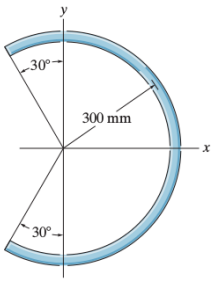
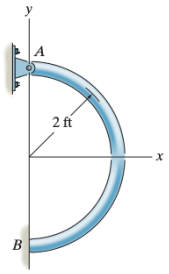
**9–1.** Locate the center of mass of the homogeneous rod bent into the shape of a circular arc.




Prob. 9–1

**9–2.** Locate the center of gravity $\bar{x}$ of the homogeneous rod bent in the form of a semicircular arc. The rod has a weight per unit length of 0.5 lb/ft. Also, determine the horizontal reaction at the smooth support $B$ and the $x$ and $y$ components of reaction at the pin $A$.




Prob. 9–2

$\bar{x} = r\cos\theta$

$\bar{y} = r\sin\theta$

$dt = rd\theta$

$\text{lím}\, ites = -120^{a}\ 120^{=\frac{2\pi}{3},\frac{2\pi}{3}}$

$\bar{y} = \frac{r^2\int_{\theta}\cos\theta d\theta}{r\int_{\theta}} = \frac{r[sen\theta]}{[\theta]} = \frac{300mm[0{,}866+0{,}866]}{\frac{4}{3}\pi} = 124{,}04mm$

$\bar{y} = \frac{r^2\int_{sen\theta d\theta}}{r\int_{\theta}} = \frac{r[\cos\theta]}{[\theta]} = -0{,}5+0{,}5 = 0mm$

$El\ punto\ es:\ (124{,}04,\ 0)$

$p = 0{,}5\frac{lb}{ft}$

$p = \frac{w}{L} = 0{,}5\frac{lb}{ft}$

$w = \left(0{,}5\frac{lb}{ft}\right)(2ft\cdot\pi) = \pi lb$

$\bar{x} = \frac{\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}}(r\cos\theta)(rd\theta)}{\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} rd\theta}$

$\Sigma M = 0 - \left(\frac{4}{\pi}ft\right)w + (4ft)\,Bx$

$(4ft)\,Bx = \frac{4ft}{lb}$

$Bx = 1lb$

$Ax = 1lb$

$Ay = \pi lb$