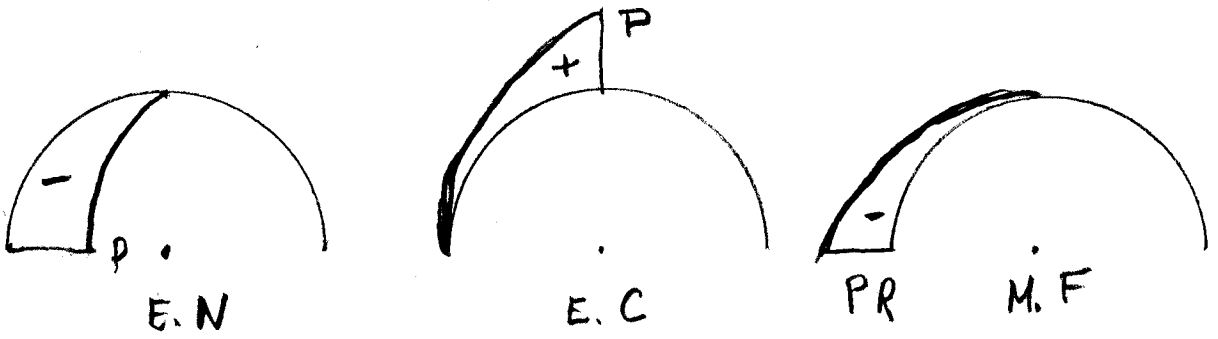
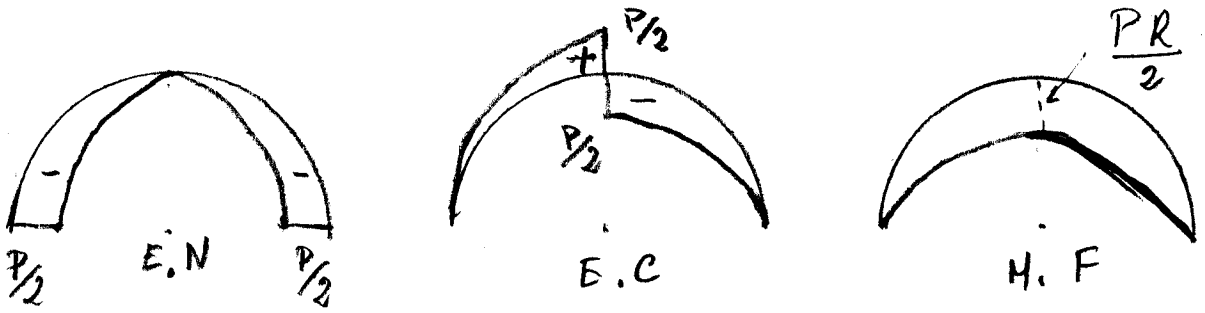
Examen de Elasticidad y Resistencia de Materiales 10/9/01

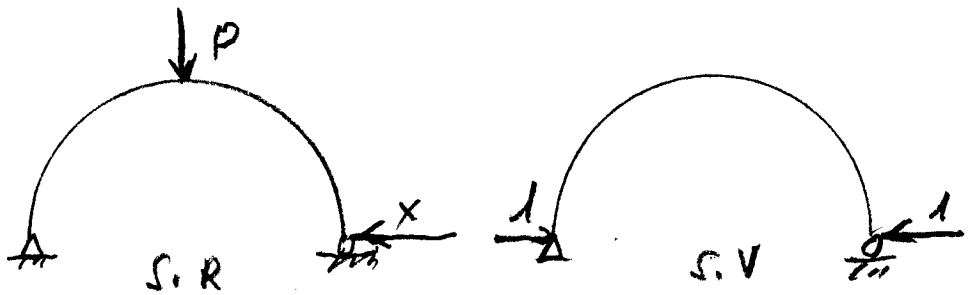
1º



2º



3º



$M_R = \frac{P}{2} R(1-\cos\theta) - X R \operatorname{sen}\theta$; $M_V = -R \operatorname{sen}\theta$ $\quad 0 < \theta < \frac{\pi}{2}$

$$2R^3\left[\int_0^{\frac{\pi}{2}} \frac{P}{2} \operatorname{sen}\theta\, d\theta - \int_0^{\frac{\pi}{4}} \frac{P}{2} \cos\theta \operatorname{sen}\theta\, d\theta - X\int_0^{\frac{\pi}{2}} \operatorname{sen}^2 d\theta\right] = 0$$

$$X = \left(-\frac{P}{2} + \frac{P}{4}\right) : \left(-\frac{\pi}{4}\right)$$

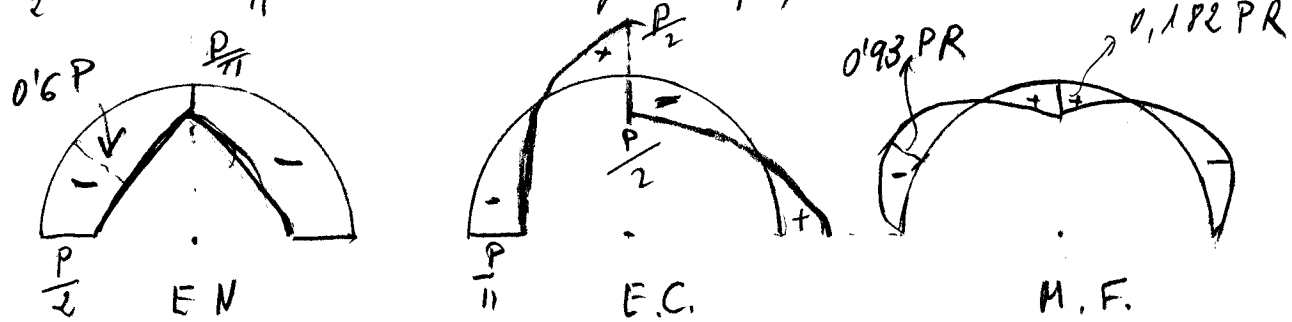
$$\boxed{X = \frac{P}{\pi}}$$

$N = -\frac{P}{2}\cos\theta - \frac{P}{\pi}\operatorname{sen}\theta$; N_{max} en $Tg\,\theta = \frac{2}{\pi} \rightarrow N_{max} = 0{,}60\,P$

$C = \frac{P}{2}\operatorname{sen}\theta - \frac{P}{\pi}\cos\theta \rightarrow C = 0$ en $Tg\,\theta = \frac{2}{\pi}$

$M = \frac{P}{2} R(1-\cos\theta) - \frac{PR}{\pi}\operatorname{sen}\theta \rightarrow$ en el punto C $\rightarrow M = 0{,}182\,PR$

$M' = \frac{P}{2} R \operatorname{sen}\theta - \frac{P}{\pi} R\cos\theta = 0 \rightarrow Tg\,\theta = \frac{2}{\pi}$; $M = -0{,}193\,PR$



4º $\frac{P}{2} R = H \cdot R \rightarrow V_A = V_B = H_A = H_B = \frac{PR}{2}$

$N = -\frac{P}{2}\cos\theta - \frac{P}{2}\operatorname{sen}\theta = -\frac{P}{2}(\cos\theta + \operatorname{sen}\theta) \rightarrow N_{max} \cdot \theta = 45°$

$N_{max} = -\frac{P}{2} 2 \frac{\sqrt{2}}{2} = -0,7P$; $C = \frac{P}{2}\operatorname{sen}\theta - \frac{P}{2}\cos\theta$

$M = \frac{P}{2} R\left(1 - \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\right) = -0'42 \frac{PR}{2} = -0,21PR$