

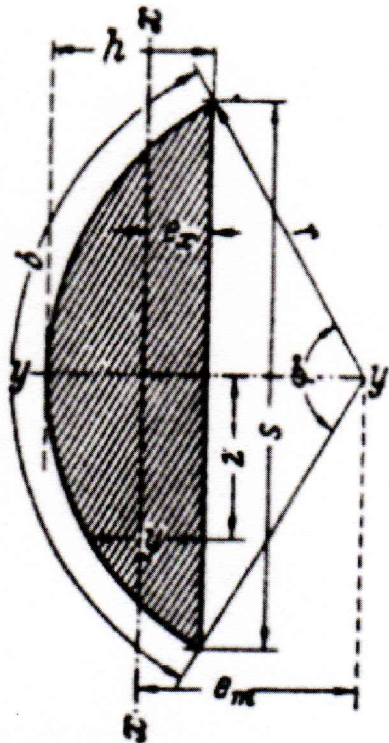
$$A_2 = A_1 + A_x$$

Position of C_{G_1} KNOWN (Axis "a")
Position of C_{G_2} KNOWN (Axis "b")

For AREA "A₂" THE AEQUILIBRIUM IS (THAT IS POSITION OF C_{G_x})

$$A_1 \times (e_{x_2} - e_{x_1}) = \overbrace{(A_2 - A_1)}^{A_x} \times X \Rightarrow$$

$$X = \frac{A_1 \times (e_{x_2} - e_{x_1})}{(A_2 - A_1)}$$



$$F = \frac{r^2}{2} \left(\frac{\pi \varphi^0}{180^0} - \sin \varphi \right)$$

$$= \frac{r(b-s) + sh}{2}$$

$$r = \frac{s^2}{8h} + \frac{h}{2}$$

Arco:

$$b = r \pi \frac{\varphi^0}{180^0}$$

$$= 0,01745 r \varphi^0$$

$$\tan \frac{\varphi}{2} = \frac{s}{2(r-h)}$$

$$e_m = \frac{s^3}{12F}$$

$$= \frac{2}{3} \frac{r^3 \sin^3 \frac{\varphi}{2}}{F}$$

$$e_x = e_m - r \cos \frac{\varphi}{2}$$

Corda:

$$s = 2r \sin \frac{\varphi}{2}$$

$$= 2 \sqrt{h(2r-h)}$$

$$h = r \left(1 - \cos \frac{\varphi}{2} \right)$$

$$= r - \sqrt{r^2 - \left(\frac{s}{2} \right)^2}$$

Ordinata:

$$y = \sqrt{r^2 - z^2} - (r-h)$$

$$J_x = \frac{r^4}{16} \left(\frac{\pi \varphi^0}{90^0} - \sin 2\varphi \right)$$

$$- \frac{20 r^4 (1 - \cos \varphi)^3}{\pi \varphi^0 - 180^0 \sin \varphi}$$

$$J_y = \frac{r^4}{48} \left(\frac{\pi \varphi^0}{30^0} - A \right)$$

$$A = 8 \sin \varphi - \sin 2\varphi$$

(Attenzione al segno del seno)

$$W_x = \frac{J_x}{h - e_x}$$

$$W_y = \frac{2 J_y}{s}$$

Per $h = \frac{1}{2}r$, ossia per $\varphi = 120^0$ risulta

$$F \approx 0,61418 r^2$$

$$e_x \approx 0,2050 r$$

$$J_x \approx 0,01066 r^4$$

$$W_x \approx 0,03613 r^3$$