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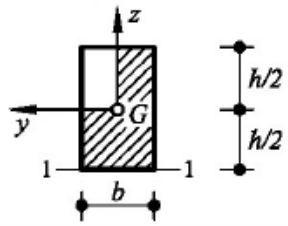
Carrera: Ingeniería Aeroespacial
Asignatura: Estructuras A.T.A.
Profesor: Mar Hervás

AREAS Y MOMENTOS DE INERCIA

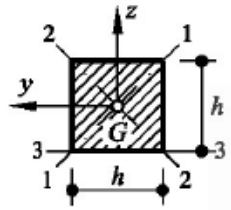
Si quieres más contenido como éste en tu mail escanea el QR

Rectángulo



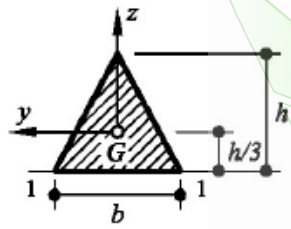
$$A = bh \qquad I_y = \frac{bh^3}{12} \qquad I_z = \frac{hb^3}{12} \qquad I_1 = \frac{bh^3}{3}$$

Cuadrado



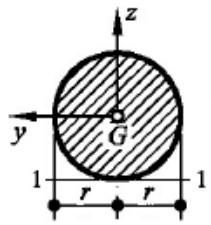
$$A = h^2 \qquad I_y = I_z = I_1 = I_2 = \frac{h^4}{12} \qquad I_3 = \frac{h^4}{3}$$

Triángulo



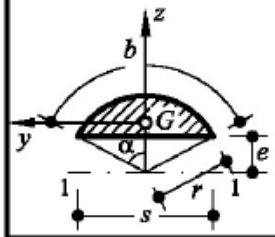
$$A = \frac{bh}{2} \qquad I_y = \frac{bh^3}{36} \qquad I_z = \frac{b^3 h}{48} \text{ (sólo isósceles)} \qquad I_1 = \frac{bh^3}{12}$$

Círculo



$$A = \pi r^2 \qquad I_y = I_z = \frac{\pi r^4}{4} \qquad I_1 = \frac{5}{4}\pi r^4 \qquad I_G = \frac{\pi r^4}{2}$$

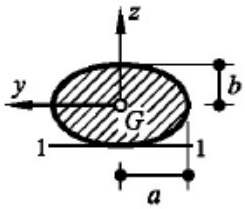
Sector circular



$$A = \alpha r^2 - \frac{s\,r\cos\alpha}{144\,A} \qquad I_y = I_1 - A\,e^2 = I_1 - \frac{s^6}{144\,A}$$

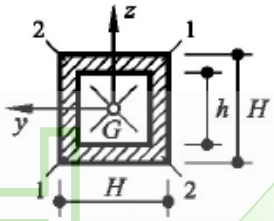
$$I_z = \frac{r^4}{8}\left(\frac{\pi\alpha}{90} - \text{sen}\,\alpha\right) \qquad I_1 = \frac{br^3}{8} - \frac{r^4}{4}\,\text{sen}\,\alpha\,\cos^3\alpha$$

Elipse



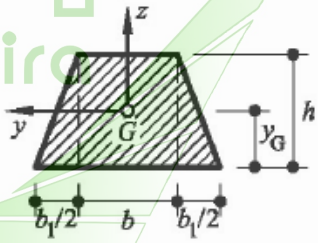
$$A = \pi ab \qquad I_y = \frac{\pi a b^3}{4} \qquad I_z = \frac{\pi}{4}a^3 b \qquad I_1 = \frac{5}{4}\pi ab^3 \qquad I_G = \frac{\pi ab}{4}(a+b)$$

Tubo cuadrado



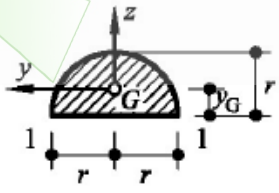
$$A = H^2 - h^2 \qquad I_y = I_z = I_1 = I_2 = \frac{H^4 - h^4}{12}$$

Trapecio



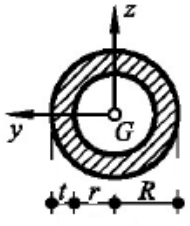
$$A = \frac{2b + b_1}{2}h \qquad I_y = h^3\frac{6b^2 + 6bb_1 + b_1^2}{36(2b + b_1)} \qquad y_G = \frac{1}{3}\frac{3b + 2b_1}{2b + b_1}h$$

Semicírculo



$$A = \frac{\pi r^2}{2} \qquad I_y = \left(\frac{\pi}{8} - \frac{8}{9\pi}\right)r^4 \qquad I_z = \frac{\pi}{8}r^4 \qquad y_G = \frac{4}{3}\frac{r}{\pi} \qquad I_1 = \left(\frac{\pi}{8} + \frac{8}{9\pi}\right)r^4$$

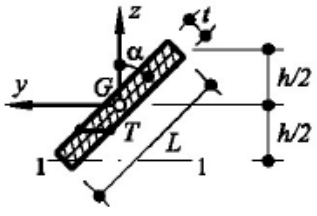
Corona circular



$$A = \pi(R^2 - r^2) \qquad r_m = \frac{R + r}{2} \qquad I_y = I_z = \frac{\pi(R^4 - r^4)}{4} \qquad I_G = \frac{\pi(R^4 - r^4)}{2}$$

si $t << r_m$ (anillo delgado) $\quad A = 2\pi r_m t \qquad I_y = I_z = \pi r_m^3 t \qquad I_G = 2\pi r_m^3 t$

Rectángulo delgado



$$L >> t \qquad A = Lt = hT \qquad T = \frac{t}{\cos\beta}$$

$$I_y = \frac{tL^3}{12}\cos^2\alpha \approx \frac{Th^3}{12} \qquad I_1 = \frac{tL^3}{3}\cos^2\beta \approx \frac{Th^3}{3}$$

ESTRUCTURAS (ATA)

Profesora: Mar Hervás