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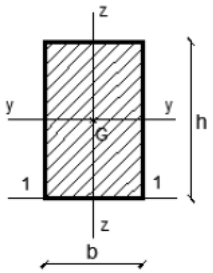
Asignatura: MECÁNICA FÍSICA
Profesora: MAR HERVÁS

CENTROS DE GRAVEDAD Y MOMENTOS DE INERCIA

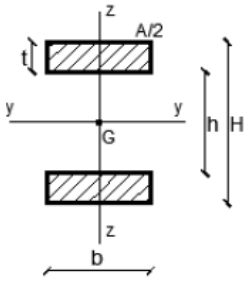
RECTÁNGULO



$$A = b \cdot h$$

$$I_y = \frac{b \cdot h^3}{12} \qquad I_z = \frac{h \cdot b^3}{12}$$

$$I_1 = \frac{b \cdot h^3}{3}$$

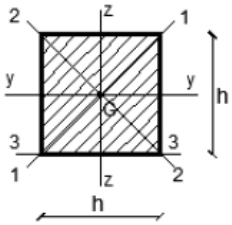


$$A = 2 \cdot b \cdot t$$

$$I_y = \frac{b}{12} \cdot (H^3 - h^3)$$

$$I_z = \frac{b^3}{12} \cdot (H - h)$$

CUADRADO

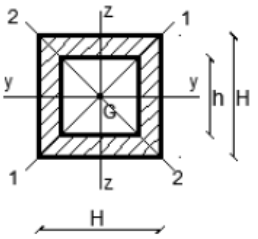


$$A = h^2$$

$$I_y = I_z = I_1 = I_2 = \frac{h^4}{12}$$

$$I_3 = \frac{h^4}{3}$$

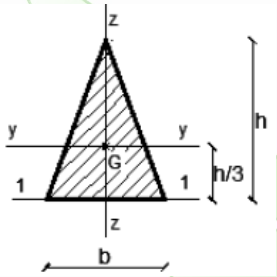
TUBO CUADRADO



$$A = H^2 - h^2$$

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

TRIÁNGULO



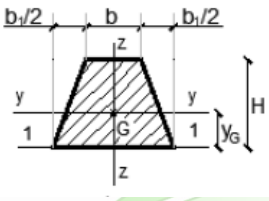
$$A = \frac{b \cdot h}{2}$$

$$I_y = \frac{b \cdot h^3}{36} \qquad I_z = \frac{h \cdot b^3}{48} \quad (*)$$

$(sólo\ isósceles)$

$$I_1 = \frac{b \cdot h^3}{12}$$

TRAPECIO

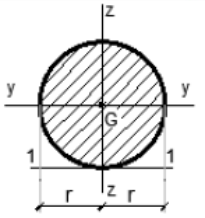


$$A = \frac{2 \cdot b + b_1}{2} \cdot h$$

$$I_y = h^3 \cdot \frac{6 \cdot b^2 + 6 \cdot b \cdot b_1 + b_1^2}{36 \cdot (2 \cdot b + b_1)}$$

$$y_G = \frac{1}{3} \cdot \frac{3 \cdot b + 2 \cdot b_1}{2 \cdot b + b_1} \cdot h$$

CÍRCULO

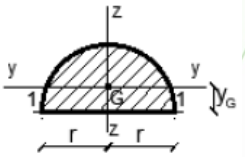


$$A = \pi \cdot r^2$$

$$I_y = I_z = \frac{\pi \cdot r^4}{4} \qquad I_1 = \frac{5}{4} \cdot \pi \cdot r^4$$

$$I_G = \frac{\pi \cdot r^4}{2}$$

SEMICÍRCULO

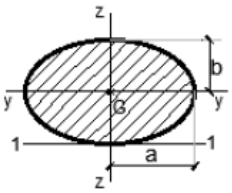


$$A = \frac{\pi \cdot r^2}{2} \qquad y_G = \frac{4}{3} \cdot \frac{r}{\pi}$$

$$I_y = \left(\frac{\pi}{8} - \frac{8}{9 \cdot \pi}\right) \cdot r^4 \qquad I_z = \frac{\pi \cdot r^4}{8}$$

$$I_1 = \left(\frac{\pi}{8} + \frac{8}{9 \cdot \pi}\right) \cdot r^4$$

ELIPSE



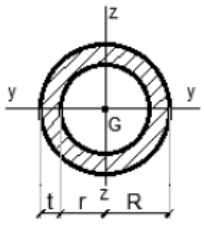
$$A = \pi \cdot a \cdot b$$

$$I_y = \frac{\pi \cdot a \cdot b^3}{4} \qquad I_z = \frac{\pi \cdot b \cdot a^3}{4}$$

$$I_1 = \frac{5}{4} \cdot \pi \cdot a \cdot b^3$$

$$I_G = \frac{\pi \cdot a \cdot b}{4} \cdot (a^2 + b^2)$$

CORONA CIRCULAR



$$A = \pi \cdot (R^2 - r^2) \qquad r_m = \frac{R + r}{2}$$

$$I_y = I_z = \frac{\pi \cdot (R^4 - r^4)}{4}$$

$$I_G = \frac{\pi \cdot (R^4 - r^4)}{2}$$

$si\ t \ll r_m\ (anillo\ delgado) \qquad A = 2 \cdot \pi \cdot t \cdot r_m$

$$I_y = I_z = \pi \cdot t \cdot r_m^3 \qquad I_G = 2 \cdot \pi \cdot t \cdot r_m^3$$