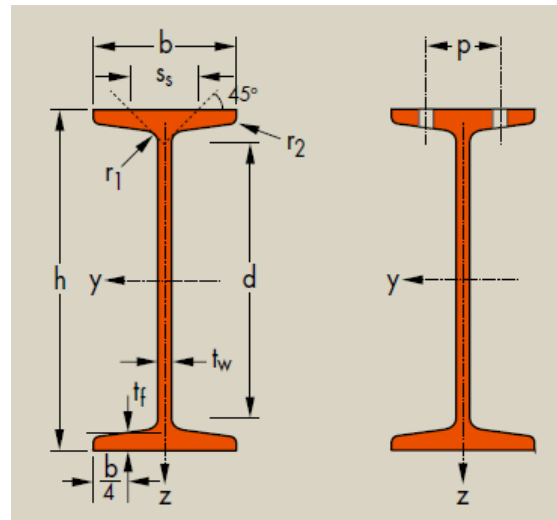


# Momentos de inercia



Cartagena99

CLASES PARTICULARES, TUTORÍAS TÉCNICAS ONLINE  
LLAMA O ENVÍA WHATSAPP: 689 45 44 70

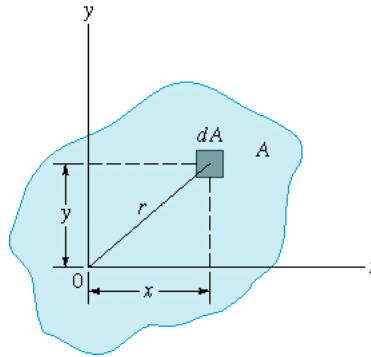
- - -

ONLINE PRIVATE LESSONS FOR SCIENCE STUDENTS  
CALL OR WHATSAPP: 689 45 44 70

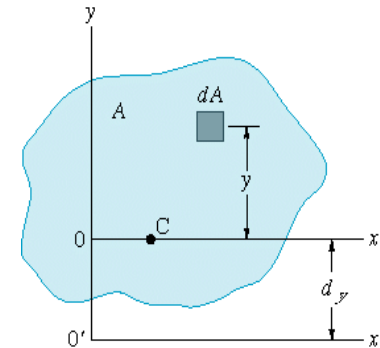
## Momentos de inercia de area

$$I_x = \int_A y^2 dA$$

$$I_y = \int_A x^2 dA$$



## Momentos de inercia respecto de un eje paralelo



## Módulo resistente (módulo de sección)

$$W = \frac{I}{c}$$

$$I_{y'} = I_y + A \cdot d_x^2$$

## Momento de inercia polar

$$J = I_x + I_y$$

## Radio de giro

## Primer momento cortante

$$\sqrt{I}$$

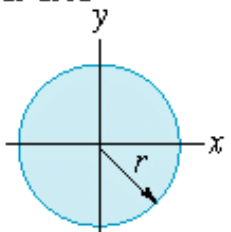
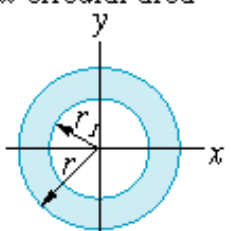
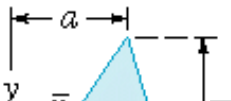
**Cartagena99**

CLASES PARTICULARES, TUTORÍAS TÉCNICAS ONLINE  
LLAMA O ENVÍA WHATSAPP: 689 45 44 70

---

ONLINE PRIVATE LESSONS FOR SCIENCE STUDENTS  
CALL OR WHATSAPP: 689 45 44 70

# Momentos de inercia de Área

Cross section	Centroid	Area moment of inertia	Area
Circular area 	$\bar{x} = 0$ $\bar{y} = 0$	$I_x = I_y = \frac{\pi}{4} r^4$ $I_y = I_x = \frac{\pi}{4} r^4$ $J = \frac{\pi}{2} r^4$	$A = \pi r^2$
Hollow circular area 	$\bar{x} = 0$ $\bar{y} = 0$	$I_x = I_y = \frac{\pi}{4} (r^4 - r_i^4)$ $I_y = I_x = \frac{\pi}{4} (r^4 - r_i^4)$ $J = \frac{\pi}{2} (r^4 - r_i^4)$	$A = \pi (r^2 - r_i^2)$
Triangular area 	$\bar{x} = \frac{a+b}{3}$	$I_x = \frac{bh^3}{12}, I_{\bar{x}} = \frac{bh^3}{36}$ $I_y = \frac{bh(b^2 + ab + a^2)}{12}$	$A = \frac{bh}{2}$

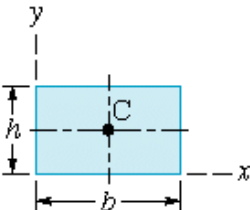
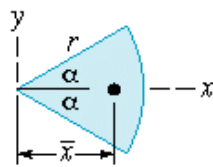
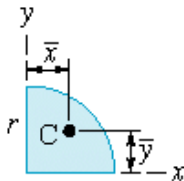

Cartagena99

CLASES PARTICULARES, TUTORÍAS TÉCNICAS ONLINE  
 LLAMA O ENVÍA WHATSAPP: 689 45 44 70

---

ONLINE PRIVATE LESSONS FOR SCIENCE STUDENTS  
 CALL OR WHATSAPP: 689 45 44 70

Guillermo Filippone

Cross section	Centroid	Area moment of inertia	Area
Rectangular area 	$\bar{x} = \frac{b}{2}$ $\bar{y} = \frac{h}{2}$	$I_x = \frac{bh^3}{3}, I_{\bar{x}} = \frac{bh^3}{12}$ $I_y = \frac{hb^3}{3}, I_{\bar{y}} = \frac{hb^3}{12}$ $\bar{J} = \frac{bh}{12}(b^2 + h^2)$	$A = bh$
Area of circular sector 	$\bar{x} = \frac{2}{3} \frac{r \sin \alpha}{\alpha}$	$I_x = \frac{r^4}{4} \left( \alpha - \frac{1}{2} \sin 2\alpha \right)$ $I_y = \frac{r^4}{4} \left( \alpha + \frac{1}{2} \sin 2\alpha \right)$ $J = \frac{1}{2} r^4 \alpha$	$A = r^2 \alpha$
Quarter-circular area 	$\bar{x} = \bar{y} = \frac{4r}{3\pi}$	$I_x = I_y = \frac{\pi r^4}{16}$ $I_{\bar{x}} = I_{\bar{y}} = \left( \frac{\pi}{16} - \frac{4}{9\pi} \right) r^4$ $J = \frac{\pi r^4}{8}$	$A = \frac{\pi r^2}{4}$
Area of elliptical quadrant 	$\bar{x} = \frac{4a}{3\pi}$	$I_x = \frac{\pi ab^3}{16}, I_{\bar{x}} = \left( \frac{\pi}{16} - \frac{4}{9\pi} \right) ab^3$	$A = \frac{\pi ab}{4}$

CLASES PARTICULARES, TUTORÍAS TÉCNICAS ONLINE  
 LLAMA O ENVÍA WHATSAPP: 689 45 44 70

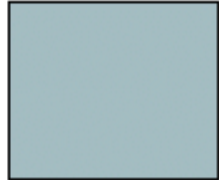
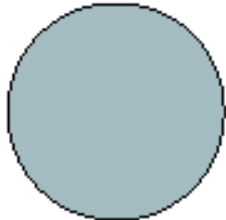
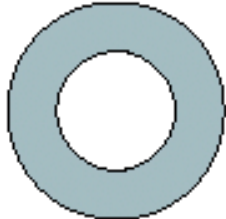
---

ONLINE PRIVATE LESSONS FOR SCIENCE STUDENTS  
 CALL OR WHATSAPP: 689 45 44 70

Cartagena99

Guillermo Filippone

## Esfuerzos cortantes de geometrías habituales

Cross section	Maximum shear stress
 Rectangular	$\tau_{\text{máx}} = \frac{3V}{2A}$
 Circular	$\tau_{\text{máx}} = \frac{4V}{3A}$
 Round tube	$\tau_{\text{máx}} = \frac{2V}{A}$



Cartagena99

CLASES PARTICULARES, TUTORÍAS TÉCNICAS ONLINE  
LLAMA O ENVÍA WHATSAPP: 689 45 44 70

---

ONLINE PRIVATE LESSONS FOR SCIENCE STUDENTS  
CALL OR WHATSAPP: 689 45 44 70