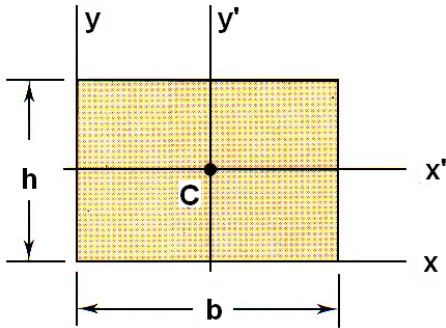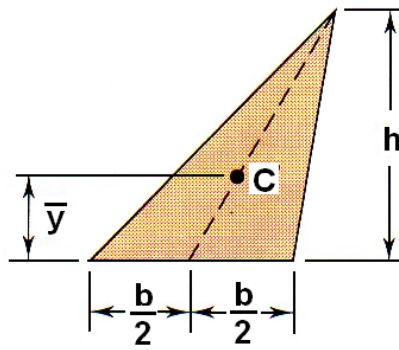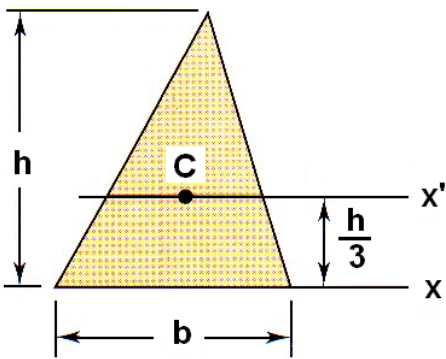# Centroid and Second Moment of Area of Common Shapes

Rectangular

$$\bar{I}_{x'} = \frac{bh^3}{12}, \qquad I_x = \frac{bh^3}{3}$$

$$J_C = \frac{bh}{12}\left(b^2 + h^2\right)$$
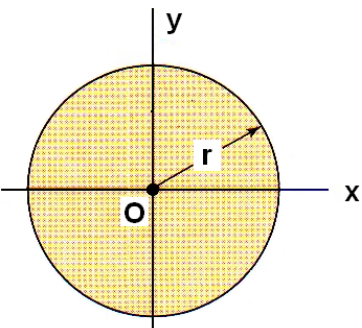
Triangular

$$\bar{I}_{x'} = \frac{bh^3}{36},$$

$$I_x = \frac{bh^3}{12}$$

$$\bar{y} = \frac{h}{3}$$

Circular

$$\bar{I}_x = \bar{I}_y = \frac{\pi r^4}{4}, \qquad J_o = \frac{\pi r^4}{2}$$

Semicircular

$$I_x = I_y = \frac{\pi r^4}{8}, \qquad J_o = \frac{\pi r^4}{4}$$

$$\bar{y} = \frac{4r}{3\pi}$$

Quarter-circular

$$I_x = I_y = \frac{\pi r^4}{16}, \qquad J_o = \frac{\pi r^4}{8}, \qquad \bar{x} = \bar{y} = \frac{4r}{3\pi}$$