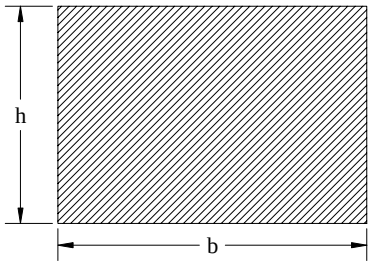
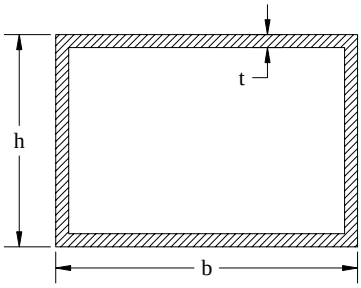
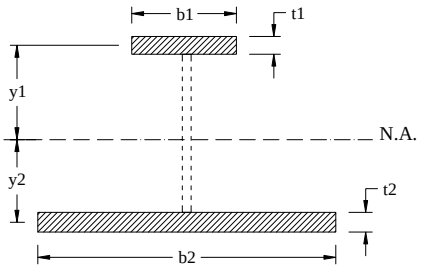
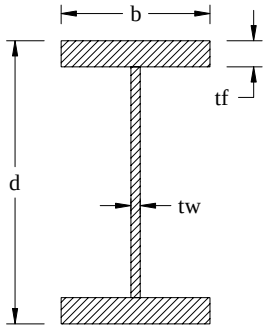
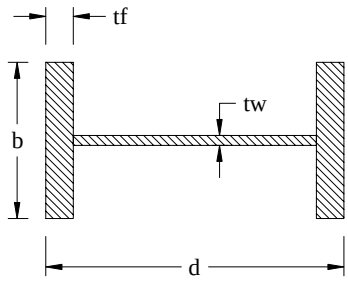
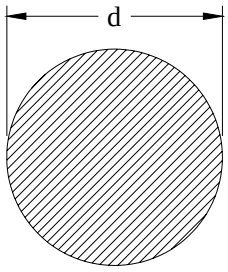
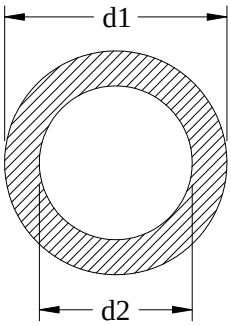
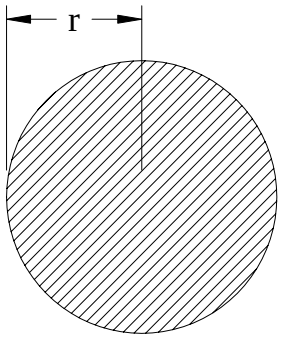
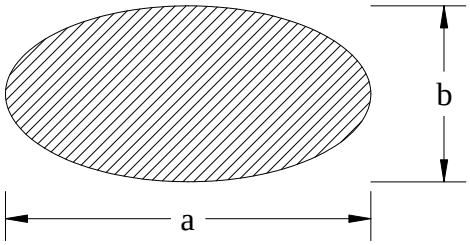
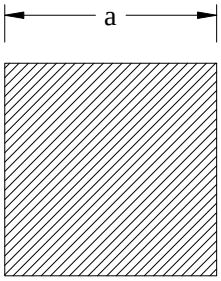
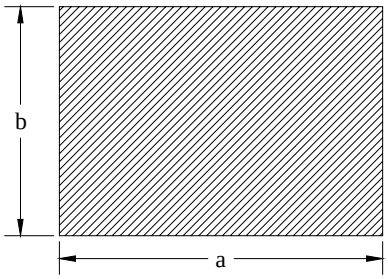
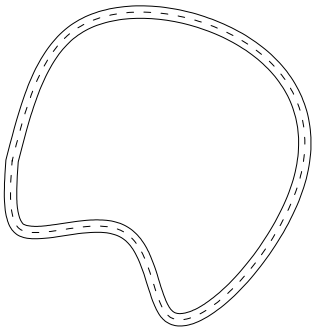
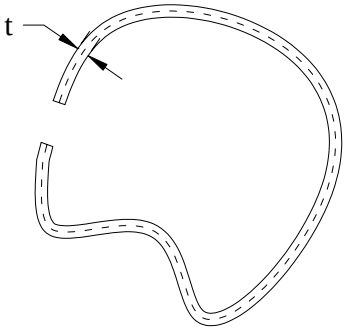
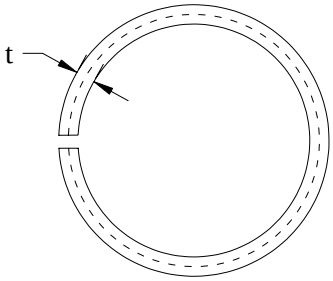
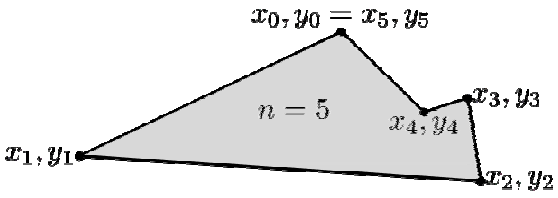
۱. جدول اساس مقطع پلاستیک

Description	Figure	Equation
Rectangular section		$Z_P = \frac{bh^2}{4}$
Hollow rectangular section		$Z_P = \frac{bh^2}{4} - (b-2t)(\frac{h}{2}-t)^2$ where: b=width, h=height, t=wall thickness
For the two flanges of an I-beam with the web excluded		$Z_P = b_1 t_1 y_1 + b_2 t_2 y_2$ where: b_1, b_2=width, t_1, t_2=thickness, t_1, t_2 are the distances from the neutral axis to the centroids of the flanges respectively.
For an I Beam including the web		$Z_P = bt_f(d-t_f) + 0.25t_w(d-2t_f)^2$
For an I Beam (weak axis)		$Z_P = (b^2 t_f)/2 + 0.25t_w^2(d-2t_f)$

Solid Circle		$Z_P = \frac{d^3}{6}$
Hollow Circle		$Z_P = \frac{d_2^3 - d_1^3}{6}$

۲. جدول ممان اینرسی قطبی

Description	Figure	Equation
Circle		$J_{zz} = J_{xx} + J_{yy} = \frac{\pi r^4}{4} + \frac{\pi r^4}{4} = \frac{\pi r^4}{2}$ where r is the radius This is identical to the second moment of area Jzz and is exact. alternatively write: $J = \frac{\pi D^4}{32}$ where D is the Diameter
Ellipse		$J \approx \frac{\pi a^3 b^3}{a^2 + b^2}$ where a is the major radius b is the minor radius
Square		$J \approx \frac{a^4}{6}$

Rectangle		$J = \frac{ab^3}{12} + \frac{ba^3}{12}$
Thin walled closed tube of uniform thickness		$J = \frac{4A^2t}{U}$ A is the mean of the areas enclosed by the inner and outer boundaries t is the wall thickness U is the length of the median boundary
Thin walled open tube of uniform thickness		$J = \frac{1}{3}Ut^3$ t is the wall thickness U is the length of the median boundary (perimeter of median cross section)
Circular thin walled open tube of uniform thickness (approximation) This is a tube with a slit cut longitudinally through its wall.		$J = \frac{2}{3}\pi rt^3$ t is the wall thickness r is the mean radius
Any polygon		$I_x = \frac{1}{12}\sum_{i=1}^{n}(x_{i+1} - x_i)(y_{i+1} + y_i)(y_{i+1}^2 + y_i^2)$ $I_y = \frac{1}{12}\sum_{i=1}^{n}(y_{i+1} - y_i)(x_{i+1} + x_i)(x_{i+1}^2 + x_i^2)$ $J_{zz} = I_x + I_y$ where : y_i, x_i are the coordinates of any polygon vertex - www.mecsym.org

۳. مرجع

http:// www.wikipedia.org