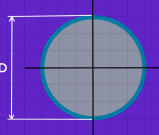
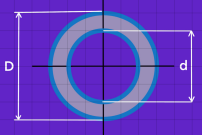
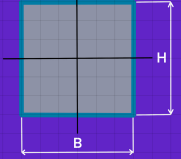
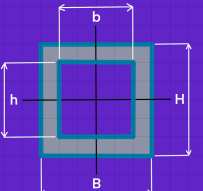
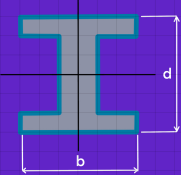
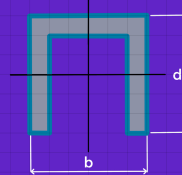
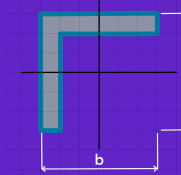
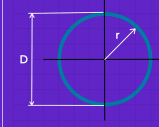


Stress in Beams

	General Case	Round Bar	Hollow Round Bar	Square Bar	Hollow Square Bar	I-Beam	C-Beam	L-Beam	Thin Walled Tube
									
						t = web and flange thickness			t = wall thickness
Tensile or Compressive Stress	$\frac{F}{A}$	$\frac{4F}{\pi D^2}$	$\frac{4F}{\pi(D^2 - d^2)}$	$\frac{F}{BH}$	$\frac{F}{BH - bh}$	$\frac{F}{t(2b + d)}$	$\frac{F}{t(b + 2d)}$	$\frac{F}{t(b + d)}$	$\frac{F}{2\pi \cdot rt}$
Bending stress (about x-x)	$\frac{My}{I_x}$	$\frac{32M}{\pi D^3}$	$\frac{32MD}{\pi(D^4 - d^4)}$	$\frac{6M}{BH^2}$	$\frac{6MH}{BH^3 - bh^3}$	$\frac{6M}{dt(6b + d)}$	$\frac{3M(b + d)}{d^2t(2b + d)}$	$\frac{6M(2b + d)}{d^2t(4b + d)}$	$\frac{M}{\pi \cdot r^2t}$
Bending stress (about y-y)	$\frac{My}{I_y}$	Same as x-x	Same as x-x	$\frac{6M}{B^2H}$	$\frac{6MB}{B^3H - b^3h}$	$\frac{3M}{b^2t}$	$\frac{6M}{bt(b + 2d)}$	$\frac{6M(b + 2d)}{b^2t(b + 4d)}$	Same as x-x
Shear Stress	$\frac{V}{A}$	$\frac{4V}{\pi D^2}$	$\frac{4V}{\pi(D^2 - d^2)}$	$\frac{V}{BH}$	$\frac{V}{BH - bh}$	$\frac{V}{t(2b + d)}$	$\frac{V}{t(b + 2d)}$	$\frac{V}{t(b + d)}$	$\frac{V}{2\pi \cdot rt}$
Torsional Stress	$\frac{Tr}{J}$	$\frac{16T}{\pi D^3}$	$\frac{16TD}{\pi(D^4 - d^4)}$	$\frac{6T}{BH\sqrt{B^2 + H^2}}$	$\frac{6T\sqrt{B^2 + H^2}}{BH(B^2 + H^2) - bh(b^2 + h^2)}$	Open sections should not be used if they are subject to significant torsion			$\frac{T}{2\pi \cdot r^2t}$

