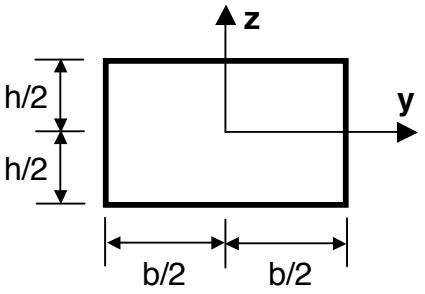
Unified HANDOUT #M-13
Spring, 2009

Areas and Moments of Inertia* for some Common Cross-Sections

RECTANGLE

$A = bh$

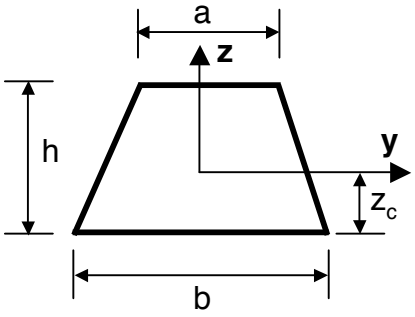
$I_{yy} = bh^3/12 \quad I_{zz} = hb^3/12 \quad I_{yz} = 0$



TRAPEZOID

$A = h(a + b)/2 \quad z_c = h(2a - b)/3(a - b)$

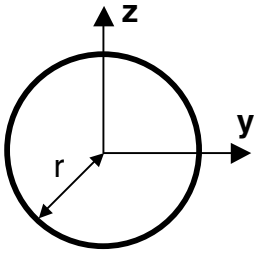
$I_{yy} = h^3(a^2 + 4ab + b^2)/36(a + b)$



CIRCLE

$A = \pi r^2 \quad J = \pi r^4/2$

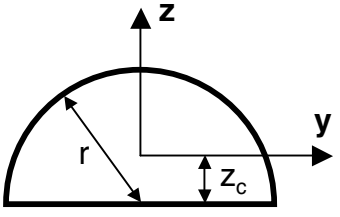
$I_{yy} = I_{zz} = \pi r^4/4 \quad I_{yz} = 0$



SEMICIRCLE

$A = \pi r^2/2 \quad z_c = 4r/3\pi$

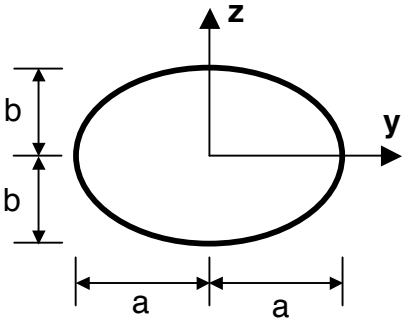
$I_{yy} = 0.1098r^4 \quad I_{zz} = \pi r^4/8 \quad I_{yz} = 0$



ELLIPSE

$A = \pi ab$

$I_{yy} = \pi ab^3/4 \quad I_{zz} = \pi ba^3/4 \quad I_{yz} = 0$



* ***NOTE:*** ***All axes are centroidal axes***