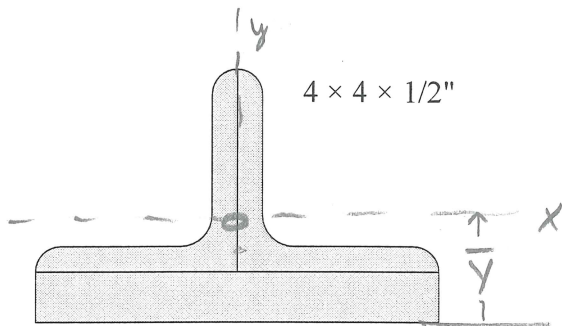


A built up beam is made of two $4 \times 4 \times 1/2$ " angles welded to a $1" \times 8"$ plate. Determine the moment of inertia about x- and y- axes passing through the centroid of the combined shape.



PART	A_i	y_i	$A_i y_i^2$
	8	1/2	4
2	7.5	2.18	16.35
	15.5		20.35

$$\bar{y} = \frac{20.35}{15.5} = 1.31''$$

$$\begin{aligned} I_y &= (I_y)_B + 2(I_y)_L \\ &= \frac{1}{12}(1)(8)^3 + 2(5.56 + 3.75(1.18)^2) \\ &= 64.23 \text{ in}^4 \end{aligned}$$

$$\begin{aligned} I_x &= (I_x)_B + 2(I_x)_L \\ &= \left[\frac{1}{12}(8)(1)^3 + 8(1.31-.5)^2 \right] + 2 \left[5.56 + 3.75(2.18-1.31)^2 \right] \\ &= 22.71 \text{ in}^4 \end{aligned}$$