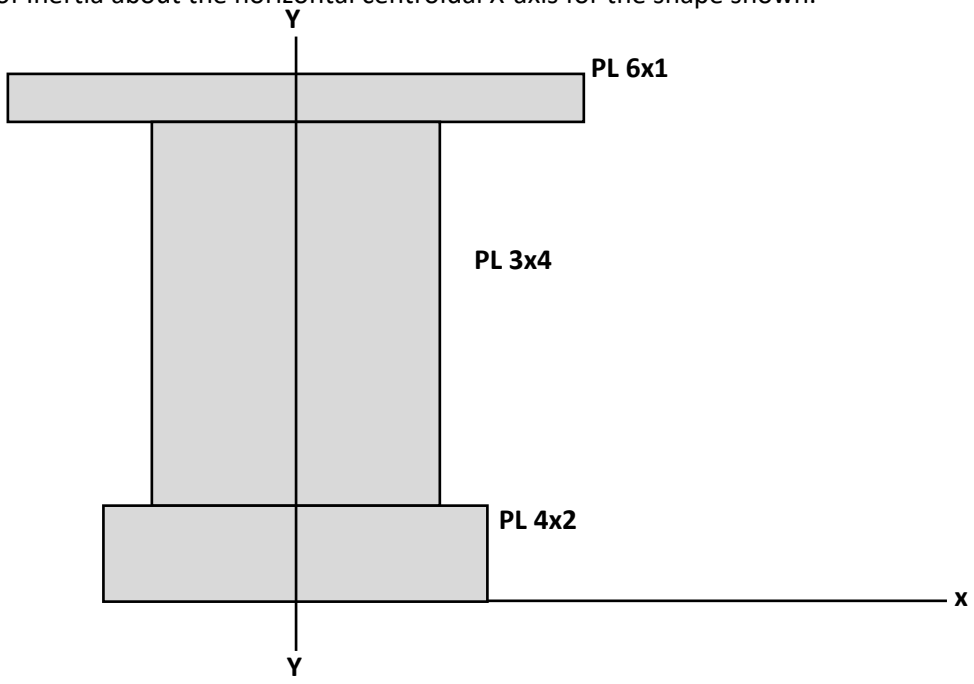
CMGT 350	Quiz #7	Fall 2022

SHOW ALL WORK FOR FULL CREDIT. DO YOUR OWN WORK.

Name: Solution

1. Calculate the Moment of Inertia about the horizontal centroidal X-axis for the shape shown.



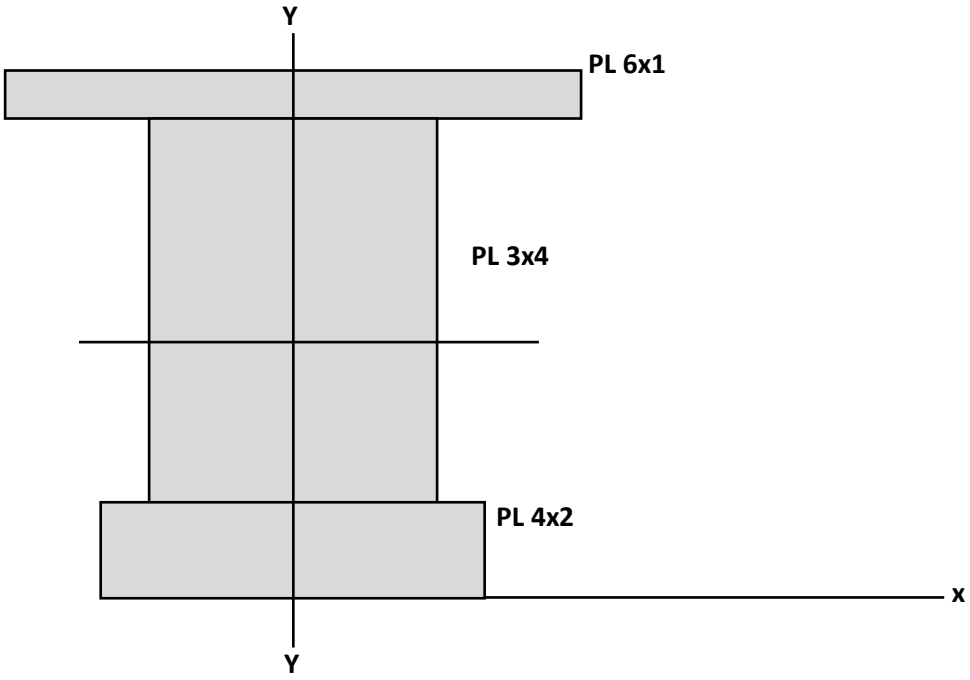
Solution.

(1) Part	(2) A (in.^{2})	(3) y (in.)	(4) Ay (in.^{3})	(5) $\bar{y} - y$ (in.)	(6) $A(\bar{y} - y)^2$ (in.^{4})	(7) I (in.^{4})
PL 4x2	8	1	8	2.65	56.18	2.67
PL 3x4	12	4	48	-0.35	1.47	16
PL 6x1	6	6.5	39	-2.85	48.735	0.5
	26		95		106.385	19.167

Y = 95/26 = 3.65 in

$I_X = \sum I + A(y-y)^2 = 19.167 \text{ in.}^4 + 106.385 \text{ in.}^4 = 125.55 \text{ in.}^4$

2. Calculate the Moment of Inertia about the vertical centroidal Y-axis for the shape shown.



Solution.

$I_Y = 2x4^3/12 + 4x3^3/12 + 1x6^3/12 = 10.67\ in.^4 + 9\ in.^4 + 18\ in.^4 = 37.67\ in.^4$