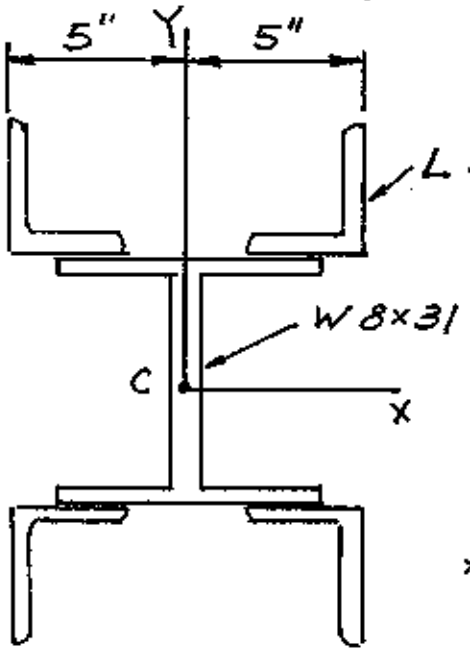
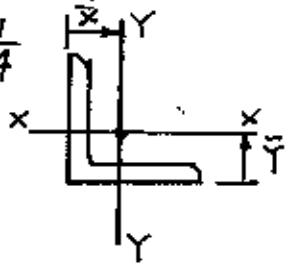
MECH 234 + 235
MOM. of INERTIA

PROB. 9.51
p. 478

G. MILANO



REFER TO p. 470 PROPERTIES



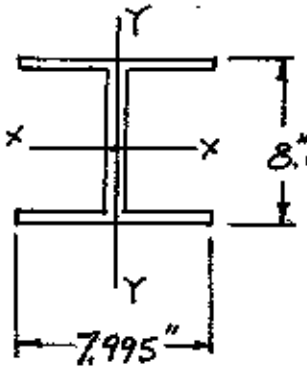
$A = 1.44\ in^2$

$I_x = 1.24\ in^4$

$\bar{Y} = 0.842"$

$I_Y = 1.24\ in^4$

$\bar{X} = 0.842"$



$A = 9.13\ in^2$

$I_x = 110\ in^4$

$\bar{Y} = 0$

$I_Y = 37.1\ in^4$

$\bar{X} = 0$

SINCE THE ANGLES ARE OFFSET FROM pt. C, APPLY THE PARALLEL AXIS THEOREM TO ALL 4.

SECT.	AREA	$I_x + A\bar{Y}^2$
W8x31	$9.13\ in^2$	$110\ in^4$
L 3x3x1/4	$1.44\ in^2 \times 4$	$4\times\left[1.24\ in^4 + (1.44\ in^2)(0.842" + 4.00")^2\right]$ (from centroid to C)
	$\Sigma A = 14.89\ in^2$	$\Sigma I_x = 250.003\ in^4 = \boxed{250\ in^4}$

RADIUS of GYRATION with respect to X-axis $k_x = \sqrt{\frac{I_x}{A}} = \sqrt{\frac{250\ in^4}{14.89\ in^2}} = 4.0975 = \boxed{4.1\ in.}$

SECT.	AREA	$I_Y + A\bar{X}^2$
W8x31	$9.13\ in^2$	$37.1\ in^4$
L 3x3x1/4	$1.44\ in^2 \times 4$	$4\times\left[1.24\ in^4 + (1.44\ in^2)(5" - 0.842")^2\right]$ (from centroid to C)
	$\Sigma A = 14.89\ in^2$	$\Sigma I_Y = 141.644\ in^4 = \boxed{141.6\ in^4}$

RADIUS of GYRATION with respect to Y-axis $k_Y = \sqrt{\frac{I_Y}{A}} = \sqrt{\frac{141.6\ in^4}{14.89\ in^2}} = 3.0843 = \boxed{3.08\ in.}$