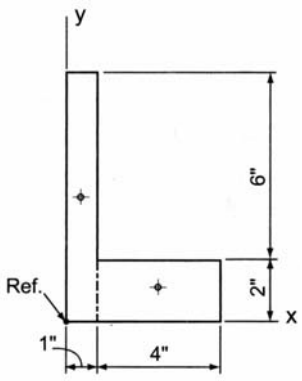
ENDS 231. Assignment #6

Date: 10/9/07, *due 10/16/07* *Pass-fail work*

Problems: from Onouye, Chapters 7 & 8.
*Note: Problems marked with a * have been altered with respect to the problem stated in the text.*

(20%) ***7.3.2** Find the I_x and I_y for the L-shaped cross-section shown. (*moment of inertia*)

***Use the negative area method.**

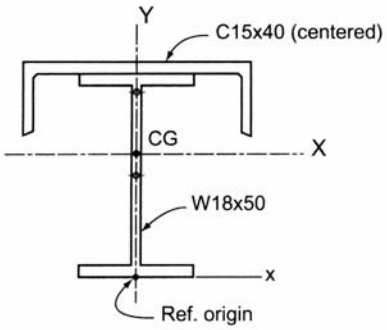


Problem 7.3.2

Partial answers to check with: $\hat{x} = 1.75$ *in,* $\hat{y} = 2.5$ *in,*
$I_x = 81.33in^4$, $I_y = 36.33in^4$

(20%) ***7.3.4** A heavily loaded floor system uses a composite steel section as shown. A C15 × 40 channel section is attached to the top flange of the W18 × 50. Determine the I_x and I_y about the major centroidal axes using the cross-sectional properties given in the steel tables for standard rolled shapes (see Appendix). (*moment of inertia*)

***Also calculate radius of gyration, r_x and r_y.**

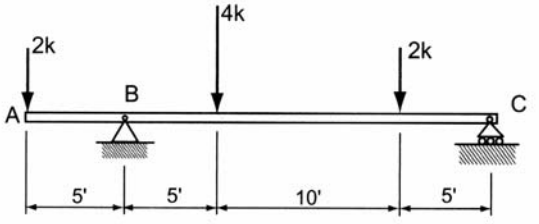


Problem 7.3.4

Partial answers to check with: $\hat{x} = 0$, $\hat{y} = 12.9in.$,
$I_x = 1309\ in.^4$, $I_y = 389\ in.^4$
$r_x = 7.03$ *in,* $r_y = 3.83$ *in*

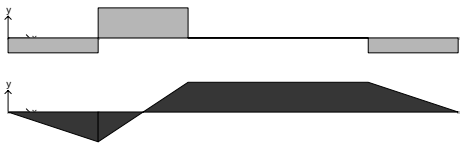
***Construct the load, shear and bending moment diagram for the following using the SEMIGRAPHICAL method, and <u>verifying</u> key values with the EQUILIBRIUM method. Identify maximum quantities and locations of shear and bending moment. Multiframe4D may be used *only* to verify calculations.**

(30%) ***8.4.1**

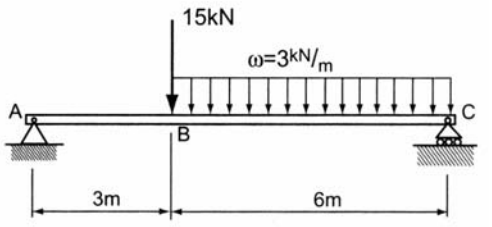


Problem 8.4.1

Partial answers to check with:
$V_{max} = +4$ *k,* $M_{max} = +10$ *k-ft*



(30%) ***8.4.4**



Problem 8.4.4

Partial answers to check with:
$V_{max} = -17$ *kN,* $M_{max} = 48.2$ *kN-m*