ENDS 231: Practice Quiz 5

*Note: A one page (one sided) crib sheet is allowed during the quiz, along with a silent, **non-programmable** calculator.*

Clearly show your work and answer.

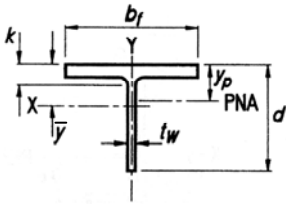
A steel section must have a void drilled into it for a special application. A WT 15 x 195.5 cut T has been bored with a cut-out as shown in the cross section diagram. *(The horizontally symmetrical cross section will consist of solid shape(s) and negative shape(s) of possible basic shapes shown and a standard steel shape.)*

a) Where is the centroid located for the composite section with respect to the origin given?

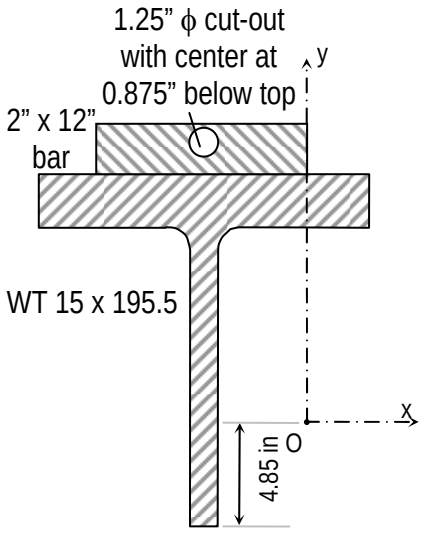
b) What is the moment of inertia, I_x [or I_y], for the composite section?

c) *[some short question from the text material]*

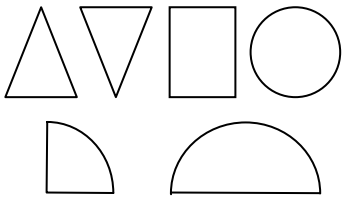
Properties for the standard steel shape:



WT 15x195.5
$A = 57.6\ in^2$
$d = 16.6\ in$
$t_w = 1.36\ in$
$b_f = 15.6\ in$
$t_f = 2.44\ in$
$I_x = 1220 in^4$
$\bar{y} = 4.00\ in$
$I_y = 774\ in^4$



cross section



possible basic shapes

Answers:

a) $\hat{x} = -6\ in,\ \hat{y} = 9.16\ in$

b) $I_x = 1634.7\ in^4$, ($I_y = 1061.9$ in)

Disclaimer: Answers have NOT been painstakingly researched.