Exam 3 Practice Problems

Problem 1

The T-shaped cantilever beam of structural steel is subjected to a transverse load P at its free end, acting through the shear center. The beam is $6.1\ m$ long. According to the Tresca yield criterion, the material yields when the maximum shear stress reaches $165\ MPa$. Determine the maximum load P. Note that the coordinate system shown at the centroid is different than what we've typically used for these problems in class (shown in red). Use $\bar{y} = 207.64\ mm$, $I_y = 4.167 * 10^{-6}\ m^4$, and $I_z = 29.94 * 10^{-6}\ m^4$. You must determine I_{yz} yourself.

Also draw the orientation of the neutral axis on the diagram and provide the angle.