Prob. 1. Determine the plastic torque $T_p$ for the square cross section shown in Fig. 1 (use $\alpha = 1$).

![Fig. 1](image1)

Prob. 2. A composite cross section is shown in Fig. 2. The applied load $T = 300$ N.m. All dimensions are in mm. It can be considered as three subsections: a circular, a rectangular, and a thin-wall square. Determine
(a) The total torsional stiffness coefficient of the cross section
(b) The maximum shear stress (in terms of G/L) and its location
(c) The plastic torque $T_p$ (use $\alpha = 1$).

![Fig. 2](image2)

Prob. 3. Consider a linearly elastic prismatic beam of arbitrary cross section subjected to bending moment with two components $M_y$ and $M_z$, let x-y-z system passes through the centroid of the cross section. With $F(x) = 0$, derive the expression for $\sigma_y$ and the expression for the direction of neutral axis.