

P1=30 marks,

P2=20marks

1. A torque M is applied to the thin walled section shown, having shear modulus G and dimensions as indicated in the figure. Determine:
 - (a) The torsional rigidity
 - (b) The leg(s) where the maximum shear stress occurs.
2. A cantilevered prismatic member, having the isosceles triangular section as shown, is subjected to a vertical load P applied at the free end and passing thru the shear center. **Determine the exact solution for the shear stress components τ_{xz} , τ_{yz}** for the very special case when $\tan^2(\alpha) = \nu/(1+\nu) = 1/3$, where ν is the Poisson's ratio. (Hint: write the equation of the boundary and use the basic method done in class for the ellipse. The special data given will simplify the governing equation for the stress function ϕ , allowing you to get its solution and hence the shear stresses. **You don't need to determine the shear center to solve the problem.**)

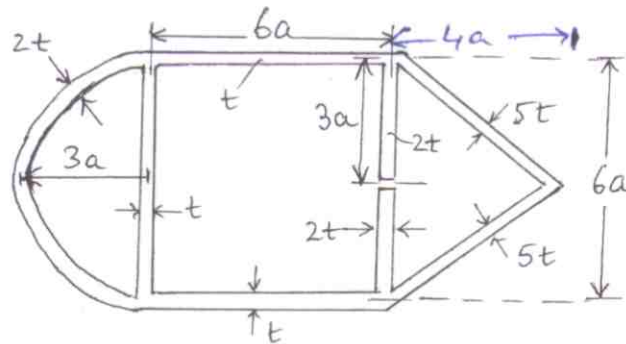


Fig: P1

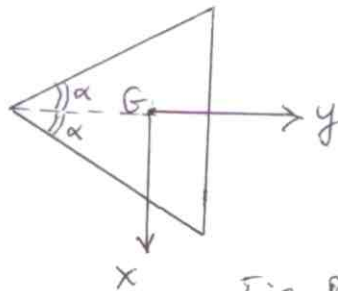


Fig: P2.