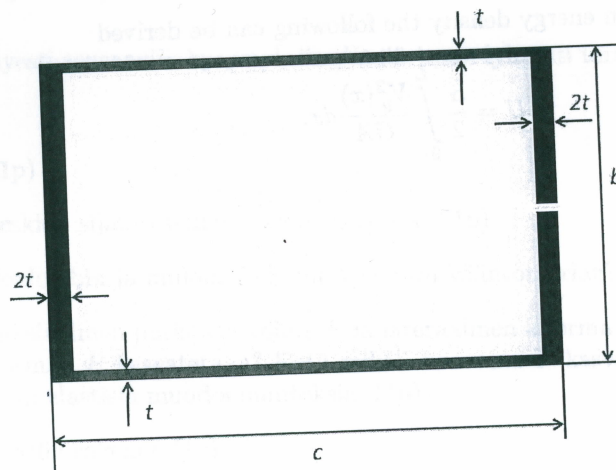


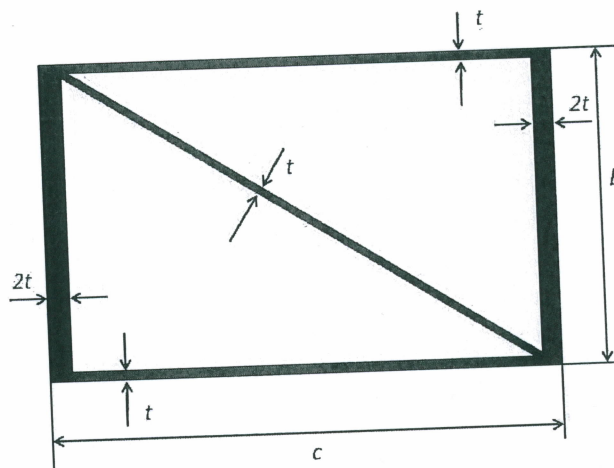
Problem 4. The thin-walled open section shown in figure 3 is subjected to a torque $T = 0,2 \text{ kNm}$. Dimensions of the figure are $c = 100 \text{ mm}$, $b = 60 \text{ mm}$, $t = 2 \text{ mm}$ and the shear modulus of the material $G = 36 \text{ GPa}$.

a) Determine the unit angle of twist and the maximum average shear stress in the beam. (2p)



Kuva 3: Figure of problem 4 a.

b) The profile is stiffened by welding to make it a closed profile and by adding a stiffener as shown in figure 4. Determine the unit angle of twist of the stiffened profile and the average shear stresses in the cell walls. (4p)



Kuva 4: Figure of problem 4 b.