

Rectangular wing, with no sweep, has a chord of 1m and an airfoil with leading edge similar to the half of elyptsis. Torsion box section is presented at the drawing. Skin thickness is equal to 1mm. All components are made of aluminum alloy. Select dimension "f" so that reaction from the brace generates no additional torsion, assuming that the brace is attached to the shear web of the spar. Check if all dimensions are large enough in the distance of $y=3+0,01(a+b)$ [m] from the wing tip.

Assumptions:

Lift distribution along the wing span = $-2y^2+30y+900+b$ [N/m]

Drag distribution = 0 [N/m]

Torsion moment distribution about $\frac{1}{4}$ of the chord has a constant value of $=-5+0,1a$ [Nm/m]

Maximum stress allowed for applied material = 290 [Mpa]

where y – distance from the wing tip

a – number of letters in student's last name

b – number of letters in student first name

