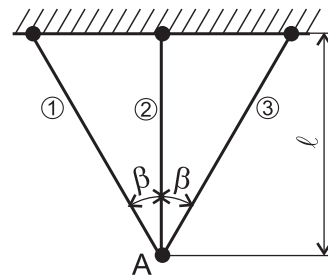


### Problem 409

Three homogeneous bars of the same cross section  $S$  were connected in the point A under a certain temperature. Calculate the stresses in the bars if they are heated by  $\Delta t$ . The bar 2 is made of steel, the bars 1 and 3 of copper.

Input values:

$$\begin{aligned} S &= 700 \text{ mm}^2, & l &= 1 \text{ m} & \beta &= 30^\circ, \\ E_{\text{steel}} &= 2,1 \cdot 10^5 \text{ MPa}, & \alpha_{\text{steel}} &= 12 \cdot 10^{-6} \text{ K}^{-1}, & \Delta t &= 60 \text{ deg} \\ E_{\text{copper}} &= 1,2 \cdot 10^5 \text{ MPa}, & \alpha_{\text{copper}} &= 16 \cdot 10^{-6} \text{ K}^{-1}. \end{aligned}$$



tension      systems with bars