Define functions u(x), $\varepsilon(x)$, $\sigma(x)$ and N(x) describing displacement, strain, normal stress and normal force along the column axis, draw the corresponding diagrams as well. The column parts are made from steel pipes with the outside diameter d_i and the wall thickness t_i , i = 1,2,3. The central part of the column is loaded with the temperature ΔT . Assume the Young modulus E = 210 GPa, the coefficient of thermal expansion $\alpha = 12 \cdot 10^{-6} \text{ K}^{-1}$. The other necessary parameters are defined in the figure. The checked values are: displacement of joins (u_1, u_2, u_3) , strains in the center of rods $(\varepsilon_1, \varepsilon_2, \varepsilon_3)$, normal stresses in the center of rods $(\sigma_1, \sigma_2, \sigma_3)$, normal forces in the center of rods (N_1, N_2, N_3) .

$$F_{1} = (100b) \text{ kN}$$

$$f_{1} = (100b) \text{ mm}$$

$$f_{1} = 3 \text{ mm}$$

$$F_{2} = (150c) \text{ kN}$$

$$f_{2} = 3,5 \text{ mm}$$

$$f_{2} = 3,5 \text{ mm}$$

$$\Delta T = (-30c) \text{ K}$$

$$F_{3} = (300a) \text{ kN}$$

$$f_{3} = 4 \text{ mm}$$