

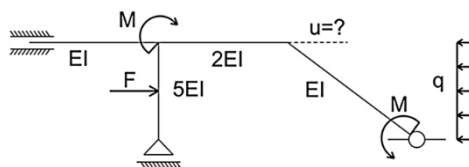
# THE FORCE METHOD

1. Designation of the degree of static indeterminacy.

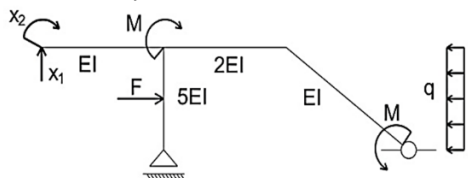
Calculation of  $n_h \geq e - 3t$

$$n_h \geq 5 - 3 \times 1$$

$$n_h \geq 2$$



2. The Primary structure of the Force Method.

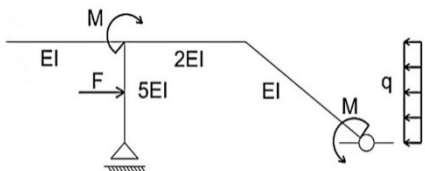


The primary structure is obtained by releasing restraints corresponding to redundant reactions. Note that by removing an appropriate number of redundants ( $n_h$ ) from the original indeterminate frame, the resulting one (primary structure) has to be stable and determinate.

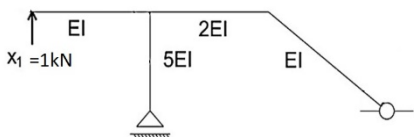
3. The system of canonical equations of the Force Method.

General form:

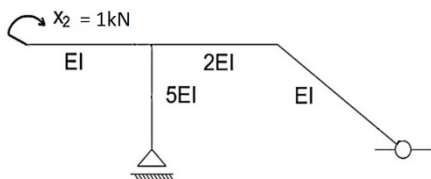
$$\begin{cases} \delta_{11}x_1 + \delta_{12}x_2 + \delta_{1F} = 0 \\ \delta_{21}x_1 + \delta_{22}x_2 + \delta_{2F} = 0 \end{cases}$$



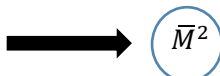
a) Solution of the primary structure due to the mechanical loading



b) Solution of the primary structure due to  $x_1 = 1\text{kN}$



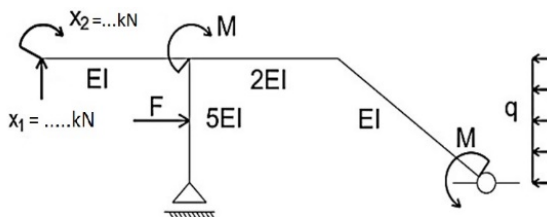
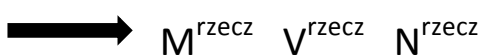
c) Solution of the primary structure due to  $x_2 = 1\text{kN}$



4. Calculation of flexibility coefficients of the system of equations:  $\delta_{11}, \delta_{12}, \delta_{1F}, \delta_{21}, \delta_{22}, \delta_{2F}$

Calculation of  $x_1, x_2$

5. Solution of the primary structure due to the mechanical loading, and the calculated (in point 4)  $x_1 = \dots, x_2 = \dots$



6. Verification of the obtained results

$$\begin{cases} \delta_{1rzecz} = 0 \\ \delta_{2rzecz} = 0 \end{cases}$$