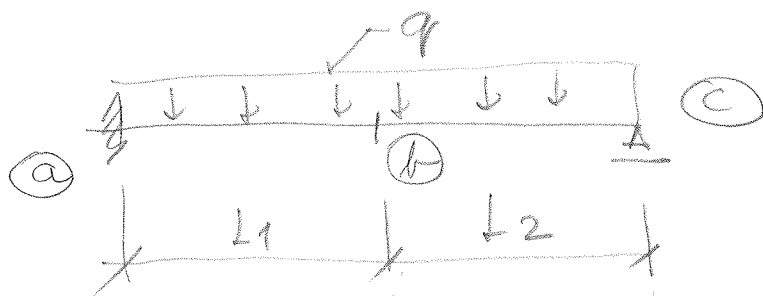
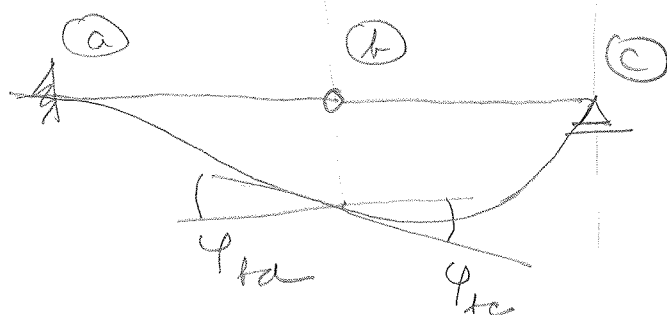


ŘEŠENÍ STAT. NEURČ. K-CÍ SILOVOU METODOU UVOLENÍM VNITŘNÍCH VÁZEB

$EI = \text{KONST.}$

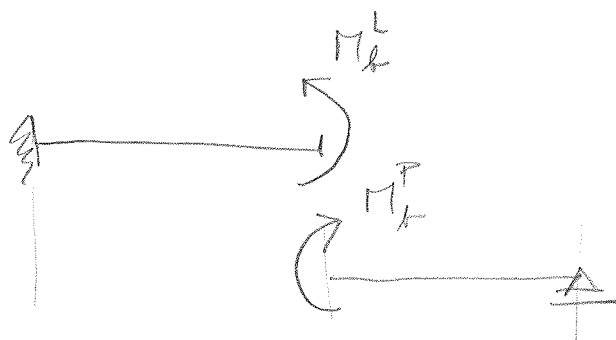


ZÁKLADNÍ STAT. URČITÁ K-CE:



DEFORMAČNÍ PODMÍNEKA:

$$|\varphi_{bc}| = |\varphi_{ba}|$$

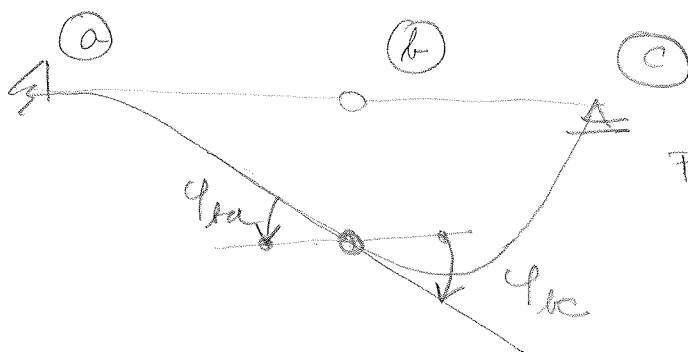


$$\sum M_{ib} = 0:$$

$$M_b^L - M_b^P = 0$$

$$M_b^L = M_b^P = M_b$$

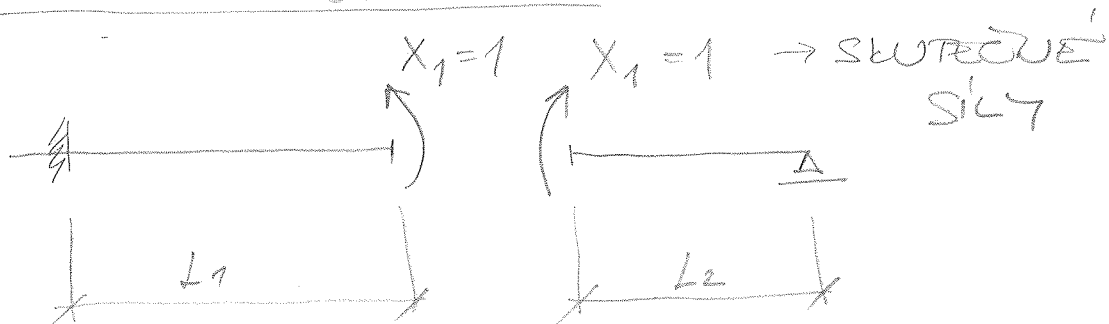
POVAŽUJTE KLADNÝ SMĚR ÚHLŮ φ_{ba} A φ_{bc} STEJNÝ JAKO MÁ STAT. NEURČITÝ MOMENT M_b .



$$\text{PŘÍSTAV: } \varphi_{ba} = -\varphi_{bc}$$

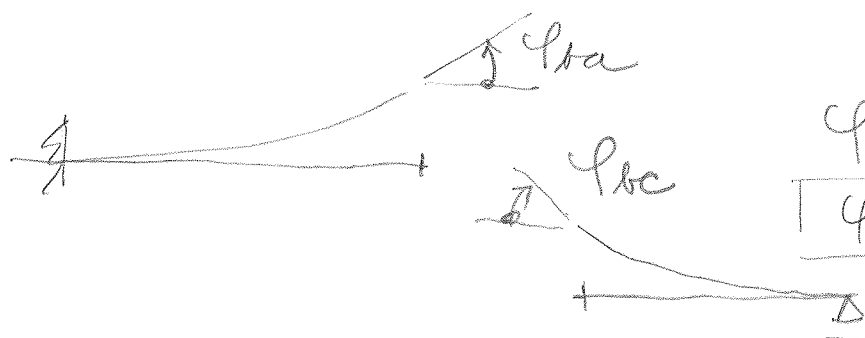
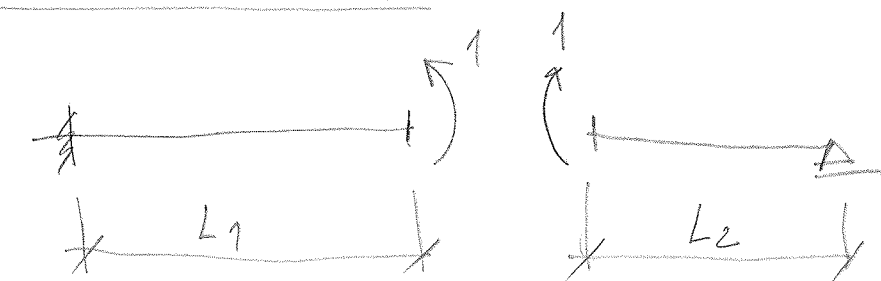
JEDNOTKOVÉ ZATÍŽENÍ:

①



VIRTUÁLNÍ SILY:

①



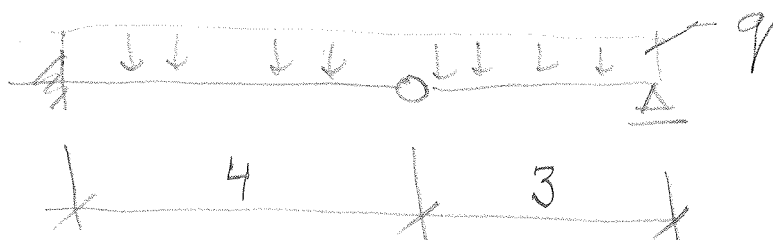
$$\begin{aligned} \phi_a &= -\phi_b \\ \phi_a + \phi_b &= 0 \end{aligned}$$

$$\phi_a = \delta_{10}^L + \delta_{11}^L \cdot X_1 \quad \phi_b = \delta_{10}^P + \delta_{11}^P \cdot X_1$$

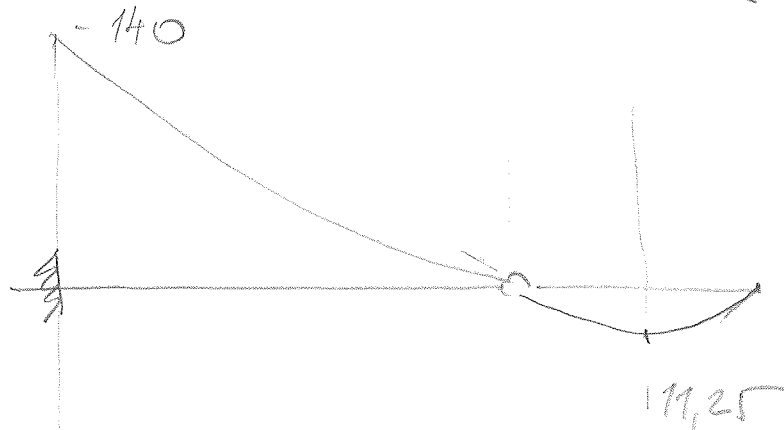
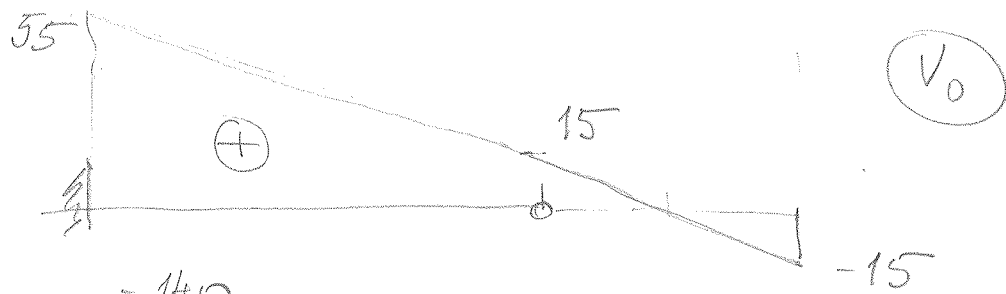
$$\delta_{10}^L + \delta_{11}^L \cdot X_1 + \delta_{10}^P + \delta_{11}^P \cdot X_1 = 0$$

$$\delta_{10}^L + \delta_{10}^P + (\delta_{11}^L + \delta_{11}^P) \cdot X_1 = 0$$

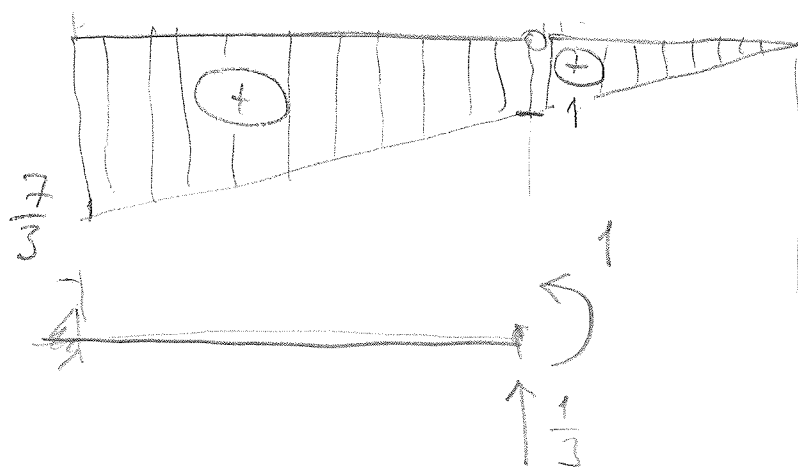
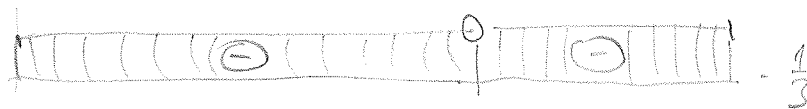
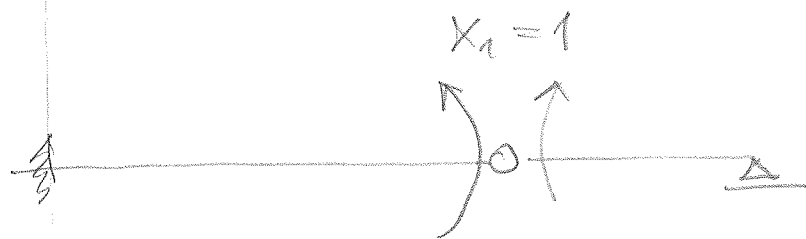
$$\delta_{10} + \delta_{11} \cdot X_1 = 0 \quad \dots \text{BEŽNÁ KANON. R-CE}$$



$$\begin{aligned} E &= 210 \text{ GPa} \\ I &= 21,4 \cdot 10^6 \text{ cm}^4 \\ q &= 10 \text{ kN/m} \end{aligned}$$



$$\frac{1}{8} \cdot 10 \cdot 4^2 = 20 \text{ kNm}$$



$$\delta_{10} = \frac{1}{EI} \cdot \left\{ \frac{1}{6} \cdot (-140 \cdot 10^2) \cdot \left(2 \cdot \left(+\frac{7}{3} \right) + (+1) \right) \cdot 4 + \right. \\ \left. + \frac{1}{3} \cdot 20 \cdot 10^3 \cdot \left(+\frac{7}{3} + 1 \right) \cdot 4 + \frac{1}{3} \cdot (-1) \cdot 11,25 \cdot 10^3 \cdot 3 \right\}$$

$$\delta_{10} = \frac{1}{EI} \cdot \{ 528000, \bar{P} + 880000, \bar{P} + 11,25 \cdot 10^3 \}$$

$$\delta_{10} = \frac{1}{EI} \{-428750\}$$

$$\delta_{11} = \frac{1}{EI} \cdot \left\{ \frac{1}{6} \left[\left(-\frac{7}{3}\right) \cdot \left(2 \cdot \left(-\frac{7}{3}\right) - 1\right) + (-1) \cdot \left(-\frac{7}{3} - 2 \cdot 1\right) \right] \cdot 4 \right. \\ \left. + \frac{1}{3} \cdot (-1) \cdot (-1) \cdot 3 \right\}$$

$$\delta_{11} = \frac{1}{EI} \cdot \{11,7037 + 1\} = \frac{1}{EI} \cdot \{12,7037\}$$

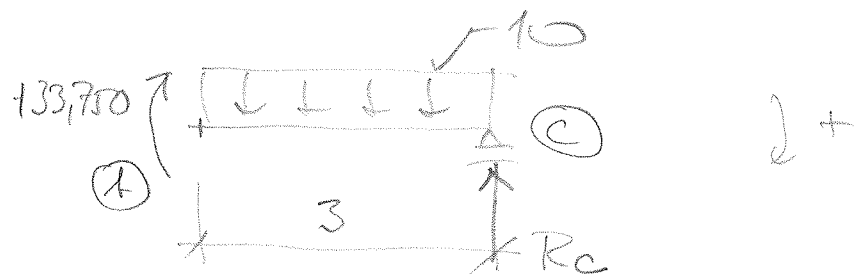
KANONICKÁ' ROVNICE

$$\delta_{10} + \delta_{11} \cdot X_1 = 0$$

$$\frac{1}{EI} \cdot (-428750) + \frac{1}{EI} \cdot 12,7037 \cdot X_1 = 0$$

$$X_1 = +33,750$$

26,25



$$\sum M_i \textcircled{2} = 0 : +33,750 + \frac{1}{2} \cdot 10 \cdot 3^2 - R_c \cdot 3 = 0$$

$$R_c = 26,25 \text{ kN}$$