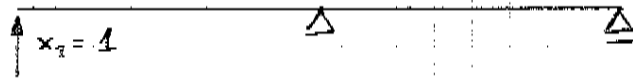
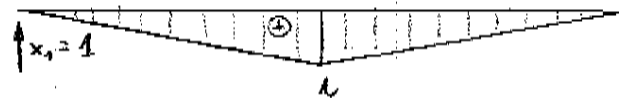


$$k = \frac{1}{2} \frac{EJ}{l^3}$$

$$\delta_{ij} = \int \frac{M_i \cdot M_j}{EJ} dx + \frac{1}{k} \cdot R_i \cdot R_j$$



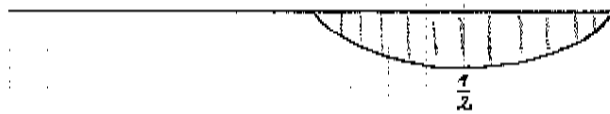
$$M_1 [l]$$



$$M_{pH} [ql^2]$$



$$M_{pQ} [ql^2]$$



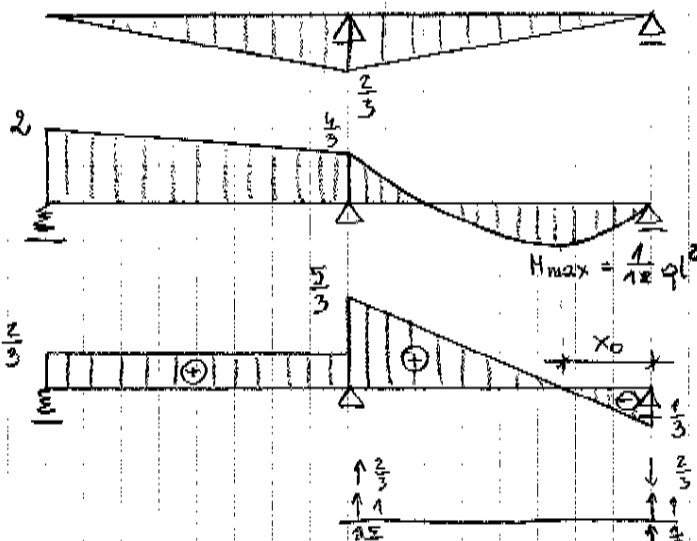
$$\delta_{11} = \frac{1}{EJ} \left[ \frac{1}{2} \cdot l \cdot l \cdot \frac{2}{3}l + \frac{1}{2} \cdot l \cdot 2l \cdot \frac{2}{3}l \right] + \frac{1}{\frac{1}{2} \frac{EJ}{l^3}} \cdot 1 \cdot 1 = 3 \frac{l^3}{EJ}$$

$$\Delta_{1P} = \frac{1}{EJ} \left[ 2ql^2 l \left( -\frac{1}{2} \cdot l \right) + \frac{1}{2} \cdot 2ql^2 \cdot 2l \cdot \left( -\frac{2}{3} \cdot l \right) + \frac{2}{3} \cdot \frac{1}{2} ql^2 \cdot 2l \cdot \left( \frac{1}{2} \cdot l \right) \right] + \frac{1}{\frac{1}{2} \frac{EJ}{l^3}} \cdot 1 \cdot 0 = -2 \frac{ql^4}{EJ}$$

$$\delta_{11} \cdot x_1 + \Delta_{1P} = 0$$

$$x_1 = -\frac{\Delta_{1P}}{\delta_{11}} = 2 \frac{ql^4}{EJ} \cdot \frac{1}{3} \frac{EJ}{l^3} = \frac{2}{3} ql$$

$$M_1 \cdot x_1 [ql^2]$$



$$M [ql^2] \quad M = M_1 \cdot x_1 + M_p$$

$$x_0 = \frac{T_0}{q} = \frac{\frac{1}{3} ql}{q} = \frac{1}{3} l$$

$$T [ql]$$

$$M_{max} = \frac{1}{3} ql \cdot \frac{1}{3} l - q \cdot \frac{1}{3} l \cdot \frac{1}{2} \cdot \frac{1}{3} l = \frac{1}{9} ql^2 - \frac{1}{18} ql^2 = \frac{1}{18} ql^2$$