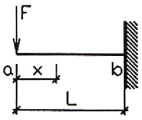
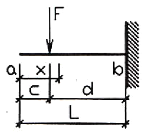
Ohybové momenty (M), reakce, posouvající síly (V), průhyby (δ), natočení (α), zatěžovací členy do třímomentových rovnic (ℵ) a náhradní rovnoměrné zatížení (f_e) na konzole a prostém nosníku pro základní případy zatížení



$M_b = -F \cdot L$, $M_x = -F \cdot x$

$V_b = -F$, $V_x = -F$

$\delta_a = \frac{F \cdot L^3}{3E \cdot I}$, $\alpha = \frac{F \cdot L^2}{2E \cdot I}$

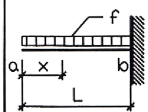


$M_b = -F \cdot d$

$M_x = -F \cdot (x - c)$ (pro $x < c$ je $M_x = 0$)

$V_b = V_x = -F$ (pro $x < c$ je $V_x = 0$)

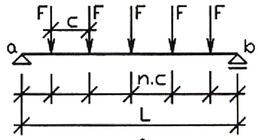
$\delta_a = \frac{F \cdot d^2 \cdot (3 \cdot L - d)}{6E \cdot I}$



$M_b = \frac{-1}{2} f \cdot L^2$, $M_x = -0{,}5 f \cdot x^2$

$V_b = -f \cdot L$, $V_x = -f \cdot x$

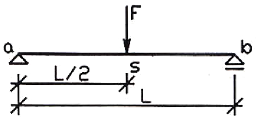
$\delta_a = \frac{f \cdot L^4}{8 \cdot E \cdot I}$, $\alpha = \frac{f \cdot L^3}{6E \cdot I}$



$f_e = \frac{n^2 - 1}{n} \cdot \frac{F}{L}$

$V_{ab} = -V_{ba} = \frac{n-1}{2} F$

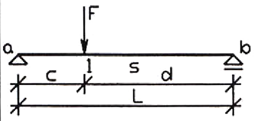
n - liché: $M_s = \frac{n^2 - 1}{8 \cdot n} \cdot F \cdot L$ n - sudé: $M_s = \frac{n}{8} \cdot F \cdot L$



$M_s = \frac{F \cdot L}{4}$, $f_e = \frac{3 \cdot F}{2 \cdot L}$

$V_{ab} = -V_{ba} = \frac{F}{2}$, $\delta_s = \frac{F \cdot L^3}{48 \cdot E \cdot I}$

$\aleph_a = \aleph_b = \frac{3}{8} F \cdot L^3$, $\alpha = \frac{F \cdot L^2}{16 E \cdot I}$

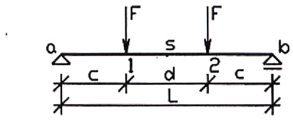


$V_{ab} = \frac{F \cdot d}{L}$, $V_{ba} = \frac{-F \cdot c}{L}$

$M_1 = \frac{F \cdot c \cdot d}{L}$, $\delta_1 = \frac{F \cdot c^2 \cdot d^2}{3 \cdot E \cdot I \cdot L}$

$\aleph_a = F \cdot c \cdot d \cdot (L + c)$, $\aleph_b = F \cdot c \cdot d \cdot (L + d)$

pro $c \le L/2$: $\delta_s = \frac{Fc(3L^2 - 4c^2)}{48 E I}$

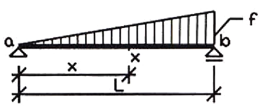


$M_1 = M_s = F c$, $\aleph_a = \aleph_b = 3\,Fcl\,(L - c)$

$V_{ab} = -V_{ba} = F$, $\delta_s = \frac{Fc(3L^2 - 4c^2)}{24 E I}$

pro $c = d = L/3$: $M_1 = M_2 = M_s = \frac{F \cdot L}{3}$

$\delta_s = \frac{23 \cdot F \cdot L^3}{648 \cdot E \cdot I}$, $\aleph_a = \aleph_b = \frac{2}{3} F \cdot L^3$

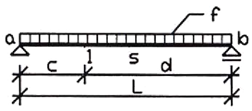


$V_{ab} = \frac{-f \cdot L}{6}$, $V_{ba} = \frac{f \cdot L}{3}$

$M_{x,max} = \frac{f \cdot L^2}{9\sqrt{3}}$, $\delta_{max} = 0{,}00652 \cdot \frac{f \cdot L^4}{E \cdot I}$

$x_M \cong 0{,}577 \cdot L$, $x_\delta \cong 0{,}519 \cdot L$

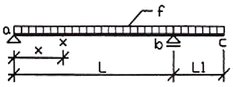
$\aleph_a = \frac{2 \cdot f \cdot L^4}{15}$, $\aleph_b = \frac{7 \cdot f \cdot L^4}{60}$



$M_1 = \frac{f c d}{2}$, $M_s = \frac{1}{8} f \cdot L^2$

$V_{ab} = -V_{ba} = \frac{f \cdot L}{2}$, $\delta_s = \frac{5 \cdot f \cdot L^4}{384 \cdot E \cdot I}$

$\aleph_a = \aleph_b = \frac{f \cdot L^4}{4}$, $\alpha = \frac{f \cdot L^3}{24 E \cdot I}$

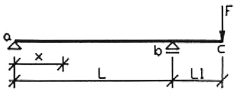


$x = \frac{L}{2}\left(1 - \frac{L_1^2}{L^2}\right)$

$M_x = \frac{f \cdot (L + L_1)^2 (L - L_1)^2}{8 \cdot L^2}$

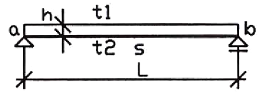
$V_{ab} = \frac{f(L^2 - L_1^2)}{2 \cdot L}$

$\delta_c = \frac{f \cdot L_1}{24 \cdot E \cdot I}(4L_1^2 \cdot L - L^3 + 3L_1^3)$



$M_x = \frac{-F \cdot L_1 \cdot x}{L}$

$V_{ab} = -F \cdot L_1 / L$, $\delta_c = \frac{F \cdot L_1}{6 \cdot E \cdot I}(2L_1 \cdot L + 2L_1^2)$

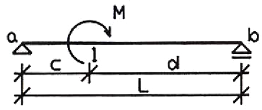


Vliv nerovnoměrného oteplení

$M = 0$, $V_{ab} = V_{ba} = 0$

$\delta_s = \frac{\varepsilon \cdot \Delta t^\circ \cdot L^2}{8 \cdot h}$, $\Delta t^\circ = t_2^\circ - t_1^\circ$

$\aleph_a = \aleph_b = \frac{3 \cdot \varepsilon \cdot \Delta t^\circ \cdot E \cdot I \cdot L^2}{h}$

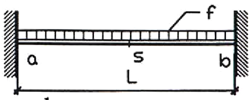


$M_{1a} = \frac{-M \cdot c}{L}$, $V_{ab} = -V_{ba} = \frac{-M}{L}$

$M_{1b} = \frac{M \cdot d}{L}$, pro $c = L/2$ je $\delta_1 = 0$

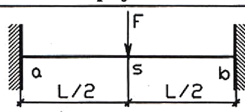
$\aleph_a = M(L^2 - 3c^2)$, $\aleph_b = M(3d^2 - L^2)$

Ohybové momenty (M), reakce, posouvající síly (V), průhyby (δ), na vetknutém a spojitém nosníku a jednoduchém rámu pro základní případy zatížení



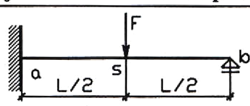
$M_a = \frac{-1}{12} f \cdot L^2$

$M_s = \frac{1}{24} f \cdot L^2$, $\delta_s = \frac{f \cdot L^4}{384 \cdot E \cdot I}$



$M_a = \frac{-1}{8} F \cdot L$

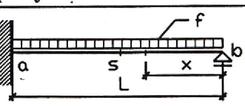
$M_s = \frac{1}{8} F \cdot L$, $\delta_s = \frac{F \cdot L^3}{192 \cdot E \cdot I}$



$V_{ab} = \frac{11}{16} F$, $V_{ba} = \frac{-5}{16} F$

$M_a = \frac{-3}{16} F \cdot L$, $M_b = 0$

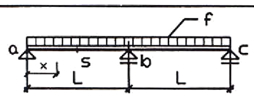
$\delta_s = \frac{7 \cdot F \cdot L^3}{768 \cdot E \cdot I}$, $M_s = \frac{5}{32} F \cdot L$



$V_{ab} = \frac{5}{8} f \cdot L$, $V_{ba} = \frac{-3}{8} f \cdot L$

$M_a = \frac{-1}{8} f \cdot L^2$, $M_b = 0$, $M_s = \frac{1}{16} f \cdot L^2$

$\delta_s = \frac{f \cdot L^4}{192 \cdot E \cdot I}$, $x = \frac{3}{8} L$, $M_x = \frac{9}{128} f \cdot L^2$

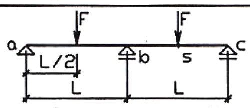


$M_b = \frac{-1}{8} f \cdot L^2$, $M_s = \frac{1}{16} f \cdot L^2$

$x = \frac{3}{8} L$, $M_x = \frac{9}{128} f \cdot L^2$

$V_{ab} = A = \frac{3}{8} f \cdot L$, $V_{bc} = \frac{5}{8} f \cdot L$

$B = \frac{10}{8} f \cdot L$, $\delta_x \cong \frac{f \cdot L^4}{190 \cdot E \cdot I}$

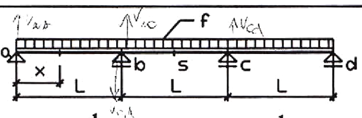


$M_b = \frac{-3}{16} F \cdot L$, $M_s = \frac{5}{32} F \cdot L$

$V_{ab} = A = \frac{5}{16} F$

$V_{bc} = \frac{11}{16} F$, $\delta_s = \frac{7 \cdot F \cdot L^3}{768 \cdot E \cdot I}$

$B = \frac{11}{8} F$

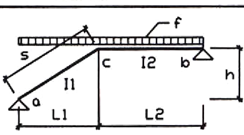


$M_b = \frac{-1}{10} f \cdot L^2$, $M_s = \frac{1}{40} f \cdot L^2$

$x = \frac{2}{5} L$, $M_x = \frac{2}{25} f \cdot L^2$

$V_{ab} = A = \frac{2}{5} f \cdot L$, $V_{cd} = \frac{3}{5} f \cdot L$

$B = \frac{11}{10} f \cdot L$, $V_{bc} = \frac{1}{2} f \cdot L$

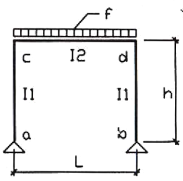


$M_c = k_1 \frac{-f \cdot L_2^2}{8}$

$A_y = B_y = \frac{f \cdot L_2}{8h}(4L_1 + k_1 \cdot L_2)$

$A_z = \frac{f \cdot L_2}{8}(5k_1 + 4k_2)$, $k_1 = \frac{I_1 \cdot L_2}{I_1 \cdot L_2 + I_2 \cdot s}$

$B_z = \frac{f \cdot L_2}{8}(3k_1 + 4k_2)$, $k_2 = \frac{I_2 \cdot s}{I_1 \cdot L_2 + I_2 \cdot s}$

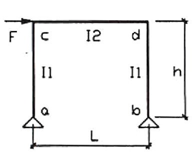


$A_z = \frac{f \cdot L}{2}$

$A_y = k \frac{f \cdot L^2}{2 \cdot h}$

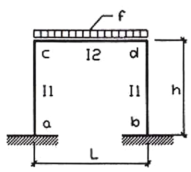
$k = \frac{I_1 \cdot L}{6\, I_1 \cdot L + 4\, h \cdot I_2}$

$M_c = M_d = k \frac{-f \cdot L^2}{2}$



$M_c = -M_d = \frac{F \cdot h}{2}$

$A_z = -B_z = \frac{F \cdot h}{L}$, $A_y = B_y = \frac{F}{2}$



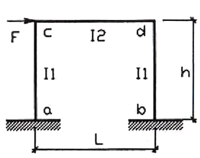
$k = \frac{I_1 \cdot L}{2\, I_1 \cdot L + I_2 \cdot h}$

$A_z = \frac{f \cdot L}{2}$

$A_y = k \frac{f \cdot L^2}{4h}$

$M_a = M_b = k \frac{f \cdot L^2}{12}$

$M_c = M_d = k \frac{-f \cdot L^2}{6}$



$k_1 = \frac{I_2 \cdot h}{I_1 \cdot L + 6\, I_2 \cdot h}$

$k_2 = \frac{I_1 \cdot L + 3\, I_2 \cdot h}{I_1 \cdot L + 6\, I_2 \cdot h}$

$A_z = -B_z =$

$= k_1 \frac{-3\, F \cdot h}{L}$

$M_a = -M_b = k_2 \frac{-F \cdot h}{2}$

$M_c = -M_d = k_1 \frac{3\, F \cdot h}{2}$, $A_y = B_y = \frac{F}{2}$