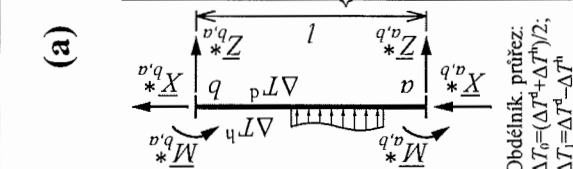
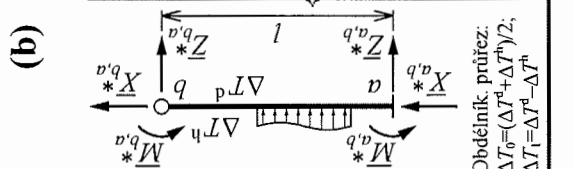
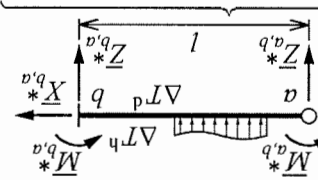
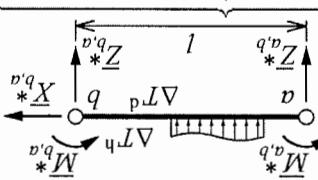


Tabulka 8.1 Primární lokální vektory koncových sil

(a)		(8.1a/1)	(8.1a/2)	(8.1a/3)	(8.1a/4)	(8.1a/5)	(8.1a/6)	(8.1a/7)	(8.1a/8)	(8.1a/9)	(8.1a/10)
 Obdélník, průřez: $\Delta T_0 = (\Delta T^a + \Delta T^b)/2$; $\Delta T_1 = \Delta T^a - \Delta T^b$	$\bar{X}_{a,b}^*$ $\bar{Z}_{a,b}^*$ $\bar{M}_{a,b}^*$	$\frac{F_x}{l} \frac{F_z}{b}$ $-\frac{b}{l} \frac{F_x}{l} \frac{F_z}{b}$ $-\frac{b^2}{l^3} \frac{F_x}{l} \frac{F_z}{b}$ $\frac{ab^2}{l^3} \frac{F_x}{l} \frac{F_z}{b}$	$\frac{F_x}{l} \frac{F_z}{l/2}$ $-\frac{1}{2} \frac{F_x}{l} \frac{F_z}{l/2}$ $-\frac{1}{2} \frac{F_x}{l} \frac{F_z}{l/2}$ $\frac{1}{8} \frac{F_x}{l} \frac{F_z}{l/2}$	$\frac{M_x}{l} \frac{M_z}{l/2}$ $-\frac{ab}{l^3} \frac{M_x}{l} \frac{M_z}{l/2}$ $\frac{2l-3b}{l^2} \frac{M_x}{l} \frac{M_z}{l/2}$	$\frac{M_x}{l} \frac{M_z}{l/2}$ 0 $\frac{3M}{2l}$ $\frac{1M}{4}$	Zatěžovací momenty tuze připojených konců se uplatní jako uzlové zatížení	$\frac{q}{l} \frac{q}{n}$ $-\frac{1}{2} \frac{nl}{2}$ $-\frac{1}{2} \frac{ql}{2}$ $\frac{1}{12} \frac{ql^2}{12}$	$\frac{q}{l} \frac{q}{n}$ $-\frac{2al-a^2}{2l}$ $-\frac{2l^3-2a^3l+a^4}{2l^3}$ $-\frac{6a^2l^2-8a^3l+3a^4}{12l^2}$	$\frac{q}{l} \frac{q}{n}$ $-\frac{1}{8} \frac{nl}{8}$ $-\frac{3}{32} \frac{ql}{32}$ $-\frac{5}{192} \frac{ql^2}{192}$	$\frac{q_a}{n_a} \frac{q_b}{n_b}$ $-\frac{2n_a+n_b}{6}$ $-\frac{7q_a+3q_b}{20}$ $-\frac{3q_a+2q_b}{60}$	$\frac{EA\alpha_T \Delta T_0}{h}$ 0 $\frac{EI}{h} \alpha_T \Delta T_1$ $-EA\alpha_T \Delta T_0$ 0 $-\frac{EI}{h} \alpha_T \Delta T_1$
 Obdélník, průřez: $\Delta T_0 = (\Delta T^a + \Delta T^b)/2$; $\Delta T_1 = \Delta T^a - \Delta T^b$	$\bar{X}_{a,b}^*$ $\bar{Z}_{a,b}^*$ $\bar{M}_{a,b}^*$	$\frac{F_x}{l} \frac{F_z}{b}$ $-\frac{b}{l} \frac{F_x}{l} \frac{F_z}{b}$ $-\frac{b^2}{2l^3} \frac{F_x}{l} \frac{F_z}{b}$ $\frac{ab}{2l^2} \frac{F_x}{l} \frac{F_z}{b}$	$\frac{F_x}{l} \frac{F_z}{l/2}$ $-\frac{1}{2} \frac{F_x}{l} \frac{F_z}{l/2}$ $-\frac{11}{16} \frac{F_x}{l} \frac{F_z}{l/2}$ $\frac{3}{16} \frac{F_x}{l} \frac{F_z}{l/2}$	$\frac{M_x}{l} \frac{M_z}{l/2}$ $-\frac{l^2-b^2}{3} \frac{M_x}{l} \frac{M_z}{l/2}$ $\frac{l^2-3b^2}{2l^2} \frac{M_x}{l} \frac{M_z}{l/2}$	$\frac{M_x}{l} \frac{M_z}{l/2}$ 0 $\frac{9M}{8l}$ $\frac{1M}{8}$	0 $\frac{3M}{2l}$ $\frac{1M}{2}$	$\frac{q}{l} \frac{q}{n}$ $-\frac{1}{2} \frac{nl}{2}$ $-\frac{5}{8} \frac{ql}{8}$ $\frac{1}{8} \frac{ql^2}{8}$	$\frac{q}{l} \frac{q}{n}$ $-\frac{2al-a^2}{2l}$ $-\frac{8al^3-4a^3l+a^4}{8l^3}$ $-\frac{(2al-a^2)^2}{8l^2}$	$\frac{q}{l} \frac{q}{n}$ $-\frac{1}{8} \frac{nl}{8}$ $-\frac{23}{128} \frac{ql}{128}$ $-\frac{7}{128} \frac{ql^2}{128}$	$\frac{q_a}{n_a} \frac{q_b}{n_b}$ $-\frac{2n_a+n_b}{6}$ $-\frac{16q_a+9q_b}{40}$ $-\frac{8q_a+7q_b}{120}$	$\frac{EA\alpha_T \Delta T_0}{h}$ $-\frac{3EI}{2hl} \alpha_T \Delta T_1$ $-\frac{3EI}{2h} \alpha_T \Delta T_1$ $-EA\alpha_T \Delta T_0$ $-\frac{3EI}{2hl} \alpha_T \Delta T_1$ 0

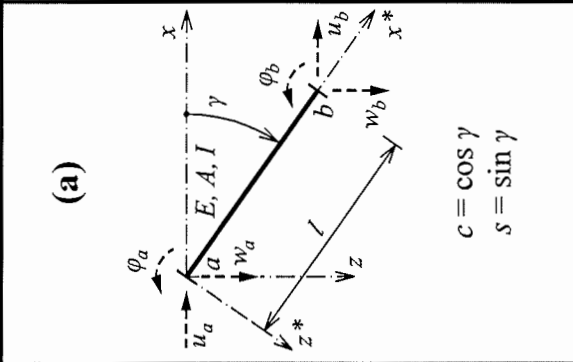
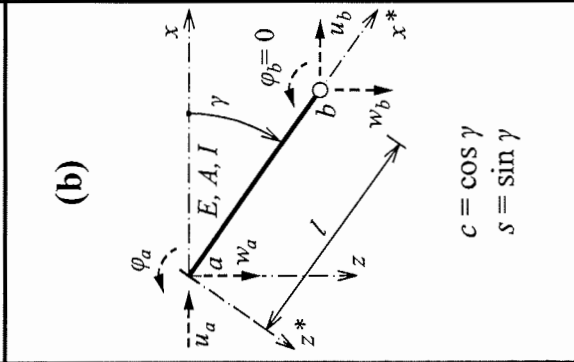
Tabulka 8.1 Primární lokální vektory koncových sil (pokračování)

(c)		(8.1c/1)	(8.1c/2)	(8.1c/3)	(8.1c/4)	(8.1c/5)	(8.1c/6)	(8.1c/7)	(8.1c/8)	(8.1c/9)	(8.1c/10)
	$\bar{X}_{a,b}^*$ $\bar{Z}_{a,b}^*$ $\bar{M}_{a,b}^*$	$\frac{b}{l} F_x$ $-\frac{b}{l} F_z$ $-\frac{3l-b}{2l^3} F_z$ 0	$-\frac{1}{2} F_x$ $-\frac{5}{16} F_z$ 0	0 $-\frac{l^2-a^2}{2l^3} M$ 0	0 $\frac{9M}{8l}$ 0	0 $\frac{3M}{2l}$ M	$-\frac{1}{2} nl$ $\frac{3}{8} ql$ 0	$-\frac{2al-a^2}{2l} n$ $\frac{8al^3-6a^2l^2+a^4}{8l^3} q$ 0	$-\frac{1}{8} nl$ $-\frac{7}{128} ql$ 0	$-\frac{2n_a+n_b}{6} l$ $\frac{11q_a+4q_b}{40} l$ 0	$E A \alpha_T \Delta T_0$ $\frac{3EI}{2hl} \alpha_T \Delta T_1$ 0
	$\bar{X}_{b,a}^*$ $\bar{Z}_{b,a}^*$ $\bar{M}_{b,a}^*$	$-\frac{a}{l} F_x$ $\frac{3l^2-a^2}{2l^3} F_z$ $-\frac{a}{2l^2} F_z$	$-\frac{1}{2} F_x$ $-\frac{11}{16} F_z$ $-\frac{3}{16} F_z l$	0 $\frac{l^2-a^2}{2l^3} M$ $\frac{l^2-3a^2}{2l^2} M$	0 $\frac{9M}{8l}$ $\frac{1}{8} M$	0 $\frac{3M}{2l}$ $\frac{1}{2} M$	$-\frac{1}{2} nl$ $\frac{5}{8} ql$ $-\frac{1}{8} ql^2$	$-\frac{a^2}{2l} n$ $\frac{6a^2l^2-a^4}{8l^3} q$ $\frac{2a^2l^2-a^4}{8l^2} q$	$-\frac{3}{8} nl$ $-\frac{57}{128} ql$ $-\frac{9}{128} ql^2$	$-\frac{n_a+2n_b}{6} l$ $\frac{9q_a+16q_b}{40} l$ $-\frac{7q_a+8q_b}{120} l^2$	$-E A \alpha_T \Delta T_0$ $\frac{3EI}{2hl} \alpha_T \Delta T_1$ $-\frac{3EI}{2h} \alpha_T \Delta T_1$
	$\bar{X}_{a,b}^*$ $\bar{Z}_{a,b}^*$ $\bar{M}_{a,b}^*$	$-\frac{b}{l} F_x$ $-\frac{b}{l} F_z$ 0	$-\frac{1}{2} F_x$ $-\frac{1}{2} F_z$ 0	0 $-\frac{M}{l}$ 0	0 $\frac{M}{l}$ 0	0 $\frac{M_1+M_2}{l}$ M_2	$-\frac{1}{2} nl$ $-\frac{1}{2} ql$ 0	$-\frac{2al-a^2}{2l} n$ $\frac{2al-a^2}{2l} q$ 0	$-\frac{1}{8} nl$ $-\frac{1}{8} ql$ 0	$-\frac{2n_a+n_b}{6} l$ $\frac{2q_a+q_b}{6} l$ 0	$E A \alpha_T \Delta T_0$ 0 0
(d)		(8.1d/1)	(8.1d/2)	(8.1d/3)	(8.1d/4)	(8.1d/5)	(8.1d/6)	(8.1d/7)	(8.1d/8)	(8.1d/9)	(8.1d/10)
	$\bar{X}_{a,b}^*$ $\bar{Z}_{a,b}^*$ $\bar{M}_{a,b}^*$	$-\frac{b}{l} F_x$ $-\frac{b}{l} F_z$ 0	$-\frac{1}{2} F_x$ $-\frac{1}{2} F_z$ 0	0 $-\frac{M}{l}$ 0	0 $\frac{M}{l}$ 0	0 $\frac{M_1+M_2}{l}$ M_2	$-\frac{1}{2} nl$ $-\frac{1}{2} ql$ 0	$-\frac{2al-a^2}{2l} n$ $\frac{2al-a^2}{2l} q$ 0	$-\frac{1}{8} nl$ $-\frac{1}{8} ql$ 0	$-\frac{2n_a+n_b}{6} l$ $\frac{2q_a+q_b}{6} l$ 0	$E A \alpha_T \Delta T_0$ 0 0
	$\bar{X}_{b,a}^*$ $\bar{Z}_{b,a}^*$ $\bar{M}_{b,a}^*$	$-\frac{a}{l} F_x$ $-\frac{a}{l} F_z$ 0	$-\frac{1}{2} F_x$ $-\frac{1}{2} F_z$ 0	0 $-\frac{M}{l}$ 0	0 $\frac{M}{l}$ 0	0 $\frac{M_1+M_2}{l}$ M_2	$-\frac{1}{2} nl$ $-\frac{1}{2} ql$ 0	$-\frac{2al-a^2}{2l} n$ $\frac{2al-a^2}{2l} q$ 0	$-\frac{1}{8} nl$ $-\frac{1}{8} ql$ 0	$-\frac{2n_a+n_b}{6} l$ $\frac{2q_a+q_b}{6} l$ 0	$E A \alpha_T \Delta T_0$ 0 0
	$\bar{X}_{a,b}^*$ $\bar{Z}_{a,b}^*$ $\bar{M}_{a,b}^*$	$-\frac{b}{l} F_x$ $-\frac{b}{l} F_z$ 0	$-\frac{1}{2} F_x$ $-\frac{1}{2} F_z$ 0	0 $-\frac{M}{l}$ 0	0 $\frac{M}{l}$ 0	0 $\frac{M_1+M_2}{l}$ M_2	$-\frac{1}{2} nl$ $-\frac{1}{2} ql$ 0	$-\frac{2al-a^2}{2l} n$ $\frac{2al-a^2}{2l} q$ 0	$-\frac{1}{8} nl$ $-\frac{1}{8} ql$ 0	$-\frac{2n_a+n_b}{6} l$ $\frac{2q_a+q_b}{6} l$ 0	$E A \alpha_T \Delta T_0$ 0 0

 Obdélník, průřez:
 $\Delta T_0 = (\Delta T^a + \Delta T^b)/2$,
 $\Delta T_1 = \Delta T^a - \Delta T^b$

 Obdélník, průřez:
 $\Delta T_0 = (\Delta T^a + \Delta T^b)/2$,
 $\Delta T_1 = \Delta T^a - \Delta T^b$

Tabulka 8.2 Globální matice tuhosti prutu

(a)  $c = \cos \gamma$ $s = \sin \gamma$	(8.2a) $[k_{a,b}] = \begin{bmatrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{bmatrix} = \begin{bmatrix} \frac{EA}{l}c^2 + \frac{12EI}{l^3}s^2 & \left(\frac{EA}{l} - \frac{12EI}{l^3}\right)cs & \frac{6EI}{l^2}s \\ \left(\frac{EA}{l} - \frac{12EI}{l^3}\right)cs & \frac{EA}{l}s^2 + \frac{12EI}{l^3}c^2 & -\frac{6EI}{l^2}c \\ \frac{6EI}{l^2}s & -\frac{6EI}{l^2}c & \frac{4EI}{l} \end{bmatrix}$ $\begin{matrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{matrix}$
(b)  $c = \cos \gamma$ $s = \sin \gamma$	(8.2b) $[k_{a,b}] = \begin{bmatrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{bmatrix} = \begin{bmatrix} \frac{EA}{l}c^2 + \frac{3EI}{l^3}s^2 & \left(\frac{EA}{l} - \frac{3EI}{l^3}\right)cs & \frac{3EI}{l^2}s \\ \left(\frac{EA}{l} - \frac{3EI}{l^3}\right)cs & \frac{EA}{l}s^2 + \frac{3EI}{l^3}c^2 & -\frac{3EI}{l^2}c \\ \frac{3EI}{l^2}s & -\frac{3EI}{l^2}c & \frac{3EI}{l} \end{bmatrix}$ $\begin{matrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{matrix}$

Tabulka 8.2 Globální matice tuhosti prutu (pokračování)

(c) $\varphi_a = 0$ $c = \cos \gamma$ $s = \sin \gamma$	(8.2c) $[k_{a,b}] = \begin{bmatrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{bmatrix} = \begin{bmatrix} \frac{EA}{l}c^2 + \frac{3EI}{l^3}s^2 & \left(\frac{EA}{l} - \frac{3EI}{l^3}\right)cs & 0 \\ \left(\frac{EA}{l} - \frac{3EI}{l^3}\right)cs & \frac{EA}{l}s^2 + \frac{3EI}{l^3}c^2 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ $\begin{matrix} u_b \\ w_b \\ \varphi_b \end{matrix}$ $[k_{a,b}] = \begin{bmatrix} -\left(\frac{EA}{l}c^2 + \frac{3EI}{l^3}s^2\right) & -\left(\frac{EA}{l} - \frac{3EI}{l^3}\right)cs & 0 \\ -\left(\frac{EA}{l} - \frac{3EI}{l^3}\right)cs & -\left(\frac{EA}{l}s^2 + \frac{3EI}{l^3}c^2\right) & 0 \\ \frac{3EI}{l^2}s & -\frac{3EI}{l^2}c & 0 \end{bmatrix}$ $\begin{matrix} u_b \\ w_b \\ \varphi_b \end{matrix}$
(d) $\varphi_a = 0$ $c = \cos \gamma$ $s = \sin \gamma$	(8.2d) $[k_{a,b}] = \begin{bmatrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{bmatrix} = \begin{bmatrix} \frac{EA}{l}c^2 & \frac{EA}{l}cs & 0 \\ \frac{EA}{l}cs & \frac{EA}{l}s^2 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ $\begin{matrix} u_b \\ w_b \\ \varphi_b \end{matrix}$ $[k_{a,b}] = \begin{bmatrix} -\frac{EA}{l}c^2 & -\frac{EA}{l}cs & 0 \\ -\frac{EA}{l}cs & -\frac{EA}{l}s^2 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ $\begin{matrix} u_b \\ w_b \\ \varphi_b \end{matrix}$

Tabulka 8.3 Lokální matice tuhosti prutu

	(8.3a) $[k_{a,b}] = \begin{bmatrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{bmatrix} = \begin{bmatrix} \frac{EA}{l} & 0 & 0 \\ 0 & \frac{12EI}{l^3} & \frac{6EI}{l^2} \\ 0 & \frac{6EI}{l^2} & \frac{4EI}{l} \end{bmatrix} \quad \begin{bmatrix} u_a \\ w_a \\ \varphi_a \end{bmatrix} \quad \begin{bmatrix} u_b \\ w_b \\ \varphi_b \end{bmatrix}$		(8.3b) $[k_{a,b}] = \begin{bmatrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{bmatrix} = \begin{bmatrix} \frac{EA}{l} & 0 & 0 \\ 0 & \frac{3EI}{l^3} & \frac{3EI}{l^2} \\ 0 & \frac{3EI}{l^2} & \frac{EI}{l} \end{bmatrix} \quad \begin{bmatrix} u_a \\ w_a \\ \varphi_a \end{bmatrix} \quad \begin{bmatrix} u_b \\ w_b \\ \varphi_b \end{bmatrix}$
	(8.3c) $[k_{a,b}] = \begin{bmatrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{bmatrix} = \begin{bmatrix} \frac{EA}{l} & 0 & 0 \\ 0 & \frac{3EI}{l^3} & \frac{3EI}{l^2} \\ 0 & \frac{3EI}{l^2} & \frac{EI}{l} \end{bmatrix} \quad \begin{bmatrix} u_a \\ w_a \\ \varphi_a \end{bmatrix} \quad \begin{bmatrix} u_b \\ w_b \\ \varphi_b \end{bmatrix}$		(8.3d) $[k_{a,b}] = \begin{bmatrix} u_a & w_a & \varphi_a \\ u_b & w_b & \varphi_b \end{bmatrix} = \begin{bmatrix} \frac{EA}{l} & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} \quad \begin{bmatrix} u_a \\ w_a \\ \varphi_a \end{bmatrix} \quad \begin{bmatrix} u_b \\ w_b \\ \varphi_b \end{bmatrix}$