Bemerkung 4.34: Elementweise Assemblierung (III)

$$\begin{aligned}\tilde{A}_{ij}^{(m)} &= \int_{\widehat{K}} C\,\nabla_{\widehat{x}} N_j(\widehat{x}) \cdot \nabla_{\widehat{x}} N_i(\widehat{x})\,|\det B|\,\mathrm{d}\widehat{x} \\ &= \gamma_1 \int_{\widehat{K}} \partial_{\widehat{x}_1} N_j \cdot \partial_{\widehat{x}_1} N_i\,\mathrm{d}\widehat{x} + \gamma_3 \int_{\widehat{K}} \partial_{\widehat{x}_2} N_j \cdot \partial_{\widehat{x}_2} N_i\,\mathrm{d}\widehat{x} + \\ &\qquad + \gamma_2 \int_{\widehat{K}} \partial_{\widehat{x}_1} N_j \cdot \partial_{\widehat{x}_2} N_i + \partial_{\widehat{x}_2} N_j \cdot \partial_{\widehat{x}_1} N_i\,\mathrm{d}\widehat{x}\end{aligned}$$

mit

$$\begin{aligned}\gamma_1 &:= c_{11}\,|\det B| = \frac{1}{|\det B|}\left(a^{(3)} - a^{(1)}\right) \cdot \left(a^{(3)} - a^{(1)}\right), \\ \gamma_2 &:= c_{12}\,|\det B| = -\frac{1}{|\det B|}\left(a^{(2)} - a^{(1)}\right) \cdot \left(a^{(3)} - a^{(1)}\right), \\ \gamma_3 &:= c_{22}\,|\det B| = \frac{1}{|\det B|}\left(a^{(2)} - a^{(1)}\right) \cdot \left(a^{(2)} - a^{(1)}\right).\end{aligned}$$

Ergebnis: $\tilde{A}^{(m)} = \gamma_1 S_1 + \gamma_2 S_2 + \gamma_3 S_3\,.$