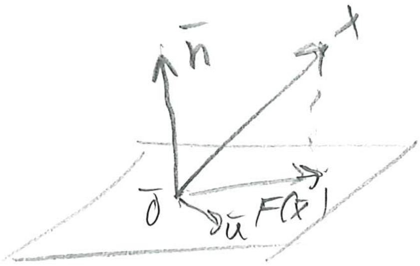
7.3.12 F ort. proj. på $x_1 + x_2 - x_3 = 0$

Bestäm A_e.



$$\bar{u} = e_1 - e_2 = \underline{e}\begin{pmatrix}1\\-1\\0\end{pmatrix}$$

$$\bar{v} = e_2 + e_3 = \underline{e}\begin{pmatrix}0\\1\\1\end{pmatrix}$$

$$\begin{cases} F(\bar{u}) = \bar{u} \\ F(\bar{v}) = \bar{v} \\ F(\bar{n}) = \bar{0} \end{cases} \Leftrightarrow \begin{cases} F(\bar{e}_1 - \bar{e}_2) = \bar{e}_1 - \bar{e}_2 \\ F(\bar{e}_2 + \bar{e}_3) = \bar{e}_2 + \bar{e}_3 \\ F(\bar{e}_1 + \bar{e}_2 - \bar{e}_3) = \bar{0} \end{cases}$$

$$\Leftrightarrow \begin{cases} F(\bar{e}_1) - F(\bar{e}_2) = \bar{e}_1 - \bar{e}_2 \\ F(\bar{e}_2) + F(\bar{e}_3) = \bar{e}_2 + \bar{e}_3 \\ F(\bar{e}_1) + F(\bar{e}_2) - F(\bar{e}_3) = \bar{0} \end{cases}$$

$$\Leftrightarrow \ldots \begin{cases} F(\bar{e}_1) = \frac{1}{3}(2\bar{e}_1 - \bar{e}_2 + \bar{e}_3) = \frac{1}{3}\underline{e}\begin{pmatrix}2\\-1\\1\end{pmatrix} \\ F(\bar{e}_2) = \frac{1}{3}(-\bar{e}_1 + 2\bar{e}_2 + \bar{e}_3) \\ F(\bar{e}_3) = \frac{1}{3}(\bar{e}_1 + \bar{e}_2 + 2\bar{e}_3) \end{cases}$$

$$A_e = \frac{1}{3}\begin{pmatrix} 2 & -1 & 1 \\ -1 & 2 & 1 \\ 1 & 1 & 2 \end{pmatrix}$$