

$$\lambda \neq 2 \quad \left| \begin{array}{ccc|c} -1 & -1 & t & S_2 - S_3 \\ 2 & t & -1 & \\ t & 2 & 2 & \end{array} \right| \xrightarrow{S_2 - S_3} \left| \begin{array}{ccc|c} -1 & -1-t & t & \\ 2 & t+1 & -1 & \\ t & 0 & 2 & \end{array} \right| \xrightarrow{S_1 + 2S_3} \left| \begin{array}{ccc|c} -1+2t & -1-t & t & \\ 0 & t+1 & -1 & \\ t+4 & 0 & 2 & \end{array} \right| =$$

$$= (-1+2t) \begin{vmatrix} t+1 & -1 \\ 0 & 2 \end{vmatrix} + (1+t) \begin{vmatrix} 0 & -1 \\ t+4 & 2 \end{vmatrix} + t \begin{vmatrix} 0 & t+1 \\ t+4 & 0 \end{vmatrix} =$$

$$= (2t-1)(2t+2) + (1+t)(t+4) + t(t+4)(t+1) =$$

$$= \cancel{4t^2} + \cancel{4t} - 2t - 2 + t + 4 + \cancel{t^2} + \cancel{4t} + t^3 + \cancel{5t^2} + \cancel{4t} = -t^3 + 3t + 2 = 0$$

$$-t^3 + 3t + 2 = 0$$

$$\begin{array}{c} 2 \\ -1 \\ -1 \end{array} \left| \begin{array}{ccc|c} -1 & 0 & 3 & 2 \\ -1 & -2 & -1 & 0 \\ -1 & -1 & 0 & 0 \\ -1 & -1 & 0 & 0 \end{array} \right|$$

$$(t+2)(t+1)^2 = 0$$

$\alpha, \beta, \gamma$  sind ein Basis für alle  $t \in \mathbb{R} \setminus \{2, -1\}$