

S 263 Nr. 2

$$a) g: \vec{x} = \begin{pmatrix} -2 \\ 1 \\ 4 \end{pmatrix} + t \begin{pmatrix} 7 \\ 8 \\ 6 \end{pmatrix}; \quad E: \vec{x} = \begin{pmatrix} 1 \\ 4 \\ 3 \end{pmatrix} + r \begin{pmatrix} 0 \\ -1 \\ 1 \end{pmatrix} + s \begin{pmatrix} 1 \\ 0 \\ 3 \end{pmatrix}$$

$$g \cap E \Rightarrow \begin{array}{l} -2 + 7t = 1 + 0 \cdot r + s \quad 7t + 0 \cdot r - s = 3 \\ 1 + 8t = 4 - r + 0 \cdot s \Rightarrow 8t + r + 0 \cdot s = 3 \\ 4 + 6t = 3 + r + 3s \quad 6t - r - 3s = -1 \end{array}$$

$$\begin{pmatrix} 7 & 0 & -1 & | & 3 \\ 8 & 1 & 0 & | & 3 \\ 6 & -1 & -3 & | & -1 \end{pmatrix} \Rightarrow \begin{pmatrix} 1 & 0 & 0 & | & 1 \\ 0 & 1 & 0 & | & -5 \\ 0 & 0 & 1 & | & 4 \end{pmatrix} \Rightarrow \begin{array}{l} t = 1 \\ r = -5 \\ s = 4 \end{array}$$

setze $t = -\frac{1}{7}$ in Geradengleichung ein

$$\Rightarrow \vec{OS} = \begin{pmatrix} -2 \\ 1 \\ 4 \end{pmatrix} + 1 \begin{pmatrix} 7 \\ 8 \\ 6 \end{pmatrix} = \begin{pmatrix} 5 \\ 9 \\ 10 \end{pmatrix} \quad s(5|9|10)$$

$$b) g: \vec{x} = \begin{pmatrix} 22 \\ -18 \\ -7 \end{pmatrix} + t \begin{pmatrix} 4 \\ 1 \\ -5 \end{pmatrix}; \quad E: \vec{x} = \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix} + r \begin{pmatrix} 4 \\ -7 \\ 1 \end{pmatrix} + s \begin{pmatrix} 0 \\ 4 \\ -3 \end{pmatrix}$$

$$g \cap E \Rightarrow \begin{array}{l} 22 + 4t = 2 + 4r + 0 \cdot s \quad 4t - 4r + 0s = -20 \\ -18 + t = 1 - 7r + 4s \Rightarrow t + 7r - 4s = 19 \\ -7 - 5t = 0 + r - 3s \quad -5t - r + 3s = 7 \end{array}$$

$$\begin{pmatrix} 4 & -4 & 0 & | & -20 \\ 1 & +7 & -4 & | & 19 \\ -5 & -1 & +3 & | & 7 \end{pmatrix} \Rightarrow \begin{pmatrix} 1 & 0 & -\frac{1}{2} & | & -2 \\ 0 & 1 & -\frac{1}{2} & | & 3 \\ 0 & 0 & 0 & | & 0 \end{pmatrix} \Rightarrow g \in E$$

g liegt in E oder $g \cap E = g$

c) löse analog s(2|2|2)