

S 94 Nr 1

$$a) \quad g: \vec{x} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} + r \begin{pmatrix} 2 \\ 1 \end{pmatrix}; \quad h: \vec{x} = \begin{pmatrix} 3 \\ 2 \end{pmatrix} + t \begin{pmatrix} 5 \\ 4 \end{pmatrix}$$

$$g \cap h = \{s\}$$

$$\begin{pmatrix} 1 \\ 0 \end{pmatrix} + r \begin{pmatrix} 2 \\ 1 \end{pmatrix} = \begin{pmatrix} 3 \\ 2 \end{pmatrix} + t \begin{pmatrix} 5 \\ 4 \end{pmatrix} \Rightarrow \begin{array}{l} 1 + 2r = 3 + 5t \\ 0 + r = 2 + 4t \end{array}$$

$$\begin{array}{l} 2r - 5t = 2 \quad | \cdot (-1) \\ r - 4t = 2 \quad | \cdot 2 \end{array}$$

$$\begin{array}{l} 2r - 5t = 2 \\ -3t = 2 \end{array}$$

$$t = -\frac{2}{3}$$

$$2r - 5 \cdot \left(-\frac{2}{3}\right) = 2 \Rightarrow 2r = 2 - \frac{10}{3} \Rightarrow r = -\frac{2}{3}$$

$$\vec{os} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} - \frac{2}{3} \begin{pmatrix} 2 \\ 1 \end{pmatrix} = \begin{pmatrix} -\frac{1}{3} \\ -\frac{2}{3} \end{pmatrix}; \quad s \left( -\frac{1}{3} \mid -\frac{2}{3} \right)$$

$$b) \quad g: \vec{x} = \begin{pmatrix} 2 \\ 2 \end{pmatrix} + r \begin{pmatrix} 1 \\ 1 \end{pmatrix}; \quad h: \vec{x} = \begin{pmatrix} 0 \\ 5 \end{pmatrix} + t \begin{pmatrix} -1 \\ 1 \end{pmatrix}$$

$$g \cap h = \{s\}$$

$$\begin{array}{l} 2 + r = 0 - t \Rightarrow r + t = -2 \quad | \cdot 1 \\ 2 + r = 5 + t \Rightarrow r - t = -2 \quad | \cdot 1 \end{array}$$

$$r + t = -2$$

$$2r = -4 \Rightarrow r = -2$$

$$-2 + t = -2 \Rightarrow t = 0$$

$$\vec{os} = \begin{pmatrix} 0 \\ 5 \end{pmatrix} + 0 \cdot \begin{pmatrix} -1 \\ 1 \end{pmatrix} \Rightarrow s(0 \mid 5)$$

$$c) \quad g: \vec{x} = \begin{pmatrix} 1 \\ 0 \\ 2 \end{pmatrix} + r \begin{pmatrix} 1 \\ -1 \\ 1 \end{pmatrix}, \quad h: \vec{x} = \begin{pmatrix} 3 \\ -2 \\ 4 \end{pmatrix} + t \begin{pmatrix} 2 \\ 3 \\ 0 \end{pmatrix}$$

$$g \cap h = \{s\}$$

$$\begin{array}{l} 1 + r = 3 + 2t \Rightarrow r - 2t = 2 \Rightarrow 2 - 2 \cdot 0 = 2 \text{ ist richtig} \\ 0 - r = -2 + 3t \Rightarrow -r - 3t = -2 \Rightarrow -2 - 3t = -2 \Rightarrow t = 0 \\ 2 + r = 4 + 0 \cdot t \Rightarrow r = 2 \end{array}$$

$$\Rightarrow \vec{os} = \begin{pmatrix} 1 \\ 0 \\ 2 \end{pmatrix} + 2 \begin{pmatrix} 1 \\ -1 \\ 1 \end{pmatrix} = \begin{pmatrix} 3 \\ -2 \\ 4 \end{pmatrix}; \quad s(3 \mid -2 \mid 4)$$