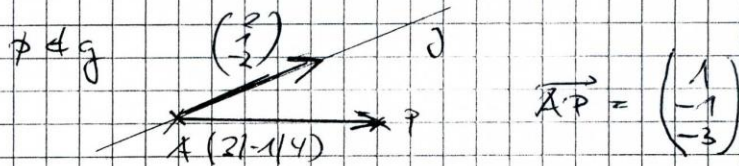


5.130/8

a) $g: \vec{x} = \begin{pmatrix} 3 \\ -1 \\ 4 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 1 \\ -2 \end{pmatrix}$ a) $P(4|-2|1)$

$P \in g?$: $\begin{pmatrix} 4 \\ -2 \\ 1 \end{pmatrix} = \begin{pmatrix} 3 \\ -1 \\ 4 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 1 \\ -2 \end{pmatrix} \rightarrow \begin{matrix} 4 = 3 + 2\lambda \\ -2 = -1 + \lambda \Leftrightarrow \lambda = -1 \\ 1 = 4 - 2\lambda \Leftrightarrow \lambda = \frac{3}{2} \end{matrix} \nabla$



$\Rightarrow E: \vec{x} = \begin{pmatrix} 3 \\ -1 \\ 4 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 1 \\ -2 \end{pmatrix} + \mu \begin{pmatrix} 1 \\ -1 \\ -3 \end{pmatrix}$

b) $P(-1|-2|8)$

$P \in g?$: $\begin{pmatrix} -1 \\ -3 \\ 8 \end{pmatrix} = \begin{pmatrix} 3 \\ -1 \\ 4 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 1 \\ -2 \end{pmatrix}$

$\Rightarrow -1 = 3 + 2\lambda \Rightarrow \lambda = -2$

$-3 = -1 + \lambda \Rightarrow \lambda = -2 \rightarrow P \in g$

$8 = 4 - 2\lambda \Rightarrow \lambda = -2$

\Rightarrow keine Ebene möglich!

5.130/11

a) $g: \vec{x} = \begin{pmatrix} 1 \\ 1 \\ 2 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix}$; $h: \vec{x} = \begin{pmatrix} 4 \\ 4 \\ 1 \end{pmatrix} + \mu \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix}$

\Rightarrow Richtungsvektoren lin. unabh. : $\begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix} = a \cdot \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix} \Rightarrow a = 2; a = 1 \nabla$

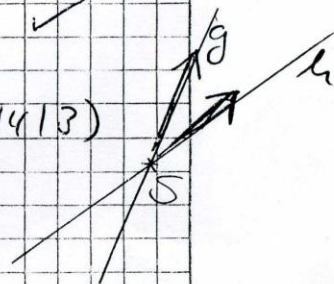
$1 + 2\lambda = 4 + \mu$

$1 + 3\lambda = 4 \Rightarrow \lambda = 1 \stackrel{II}{=} \mu = 1$

$2 + \lambda = 4 + \mu \stackrel{III}{=} 2 + 1 = 4 = 1 + 1 \checkmark$

$\Rightarrow \vec{OS} = \begin{pmatrix} 4 \\ 4 \\ 4 \end{pmatrix} - \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 3 \\ 4 \\ 3 \end{pmatrix} \Rightarrow S(3|4|3)$

$E: \vec{x} = \begin{pmatrix} 3 \\ 4 \\ 3 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix} + \mu \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix}$



(2)