

ML - Vektor - 2 SA - A

$$1. \vec{AP} = \begin{pmatrix} 1 \\ 2 \\ 4 \end{pmatrix} - \begin{pmatrix} -1 \\ -2 \\ 0 \end{pmatrix} = \begin{pmatrix} 2 \\ 4 \\ 4 \end{pmatrix} \quad E: \vec{x} = \begin{pmatrix} -1 \\ -2 \\ 0 \end{pmatrix} + u \begin{pmatrix} 2 \\ 2 \\ 3 \end{pmatrix} + v \begin{pmatrix} 2 \\ 4 \\ 4 \end{pmatrix} \checkmark$$

$$\left(\begin{array}{cc|c} 2 & 2 & x_1+1 \\ 2 & 4 & x_2+2 \\ 3 & 4 & x_3 \end{array} \right) \xrightarrow{\substack{-2 \cdot \text{R}_1 \\ -1 \cdot \text{R}_2}} \left(\begin{array}{cc|c} 2 & 2 & x_1+1 \\ -2 & 0 & -2x_1+x_2 \\ -1 & 0 & x_2-x_3+2 \end{array} \right) \xrightarrow{+2 \cdot \text{R}_2} \left(\begin{array}{cc|c} 2 & 2 & x_1+1 \\ -2 & 0 & -2x_1+x_2 \\ 0 & 0 & -2x_1-x_2+2x_3-4 \end{array} \right) \checkmark$$

$$E: 2x_1 + x_2 - 2x_3 + 4 = 0$$

(5)

$$2. \text{ in } E: 2s + 2 + 2s - 2(2+s) + 4 = 0 \rightarrow 4s + 6 - 4 - 2s = 0$$

$$\rightarrow 2s = -2 \rightarrow s = -1 \rightarrow S(-1|0|1) \checkmark$$

(3)

h schneidet E in S(-1|0|1)

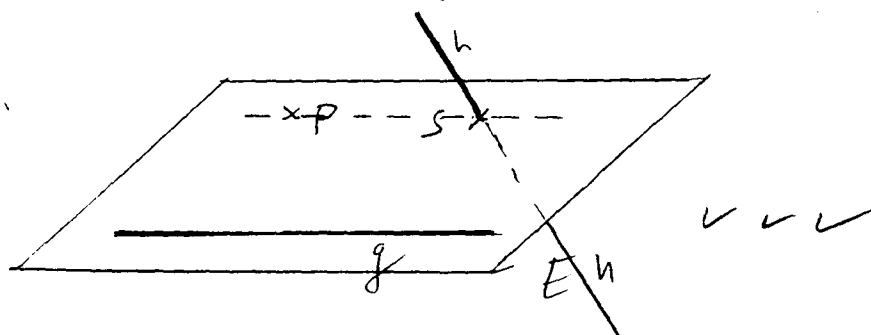
$$3.1. \vec{PS} = \begin{pmatrix} -1-1 \\ 0-2 \\ 1-4 \end{pmatrix} = \begin{pmatrix} -2 \\ -2 \\ -3 \end{pmatrix} \quad \begin{array}{l} -1 = -1 + 2r \rightarrow r=0 \\ 0 = -2 + 2r \rightarrow r=1 \\ 1 = 0 + 3r \end{array} \quad \nRightarrow S \notin g \quad (3)$$

3.2. $g \subset E; g \nparallel h; S \notin g \Rightarrow g$ windschief h $\checkmark \checkmark$

(3)

$$b) \vec{PS} \parallel \vec{v}_g \Rightarrow g \parallel \vec{PS} \parallel g \quad \checkmark$$

3.3.



(3)

$$4.1. m=0 \checkmark: F_0: 4x_1 - 2x_2 - 4x_3 = 0 \quad \text{Ursprungsebene} \checkmark$$

$$m=2 \checkmark: F_2: 4x_1 - 4x_3 + 4 = 0 \parallel x_2\text{-Achse} \checkmark$$

(4)

$$4.2. "2xE": 4x_1 + 2x_2 - 4x_3 + 8 = 0 \checkmark$$

$$\left. \begin{array}{l} \text{Vgl. mit } F_m: 4x_1 + (m-2)x_2 - 4x_3 + 2m = 0 \\ \Rightarrow m-2 = -2 \Rightarrow m=0 \\ \Rightarrow 2m = 8 \Rightarrow m=4 \end{array} \right\} \Rightarrow m=2-2 \Rightarrow m=0 \checkmark$$

$\Rightarrow E \equiv F_4$, also keine "echte Parallelität" $\checkmark$ (4)