

$$E_1^N: 2x_1 - x_2 - 2x_3 = 3$$

$$E_2^P: \vec{x} = \begin{pmatrix} 0 \\ -5 \\ -8 \end{pmatrix} + 2 \begin{pmatrix} 2 \\ 4 \\ 9 \end{pmatrix} + \mu \begin{pmatrix} 2 \\ 4 \\ 18 \end{pmatrix} \mid \begin{pmatrix} -2 \\ 1 \\ 0 \end{pmatrix}$$

$$1 \alpha \quad E_1^N \cap E_2^P \quad \vec{x} \vec{n} - H = 0$$

$$\vec{x} = \vec{x}_0 + \alpha \vec{a} + \beta \vec{b}$$

$$[\vec{x}_0 + \alpha \vec{a} + \beta \vec{b}] \vec{n} = H \quad \text{1 Gl für } \alpha, \beta$$

$$\left[\begin{pmatrix} 0 \\ -5 \\ -8 \end{pmatrix} + 2 \begin{pmatrix} 2 \\ 4 \\ 9 \end{pmatrix} + \mu \begin{pmatrix} 2 \\ 4 \\ 18 \end{pmatrix} \right] \begin{pmatrix} 2 \\ -1 \\ -2 \end{pmatrix} = 3$$

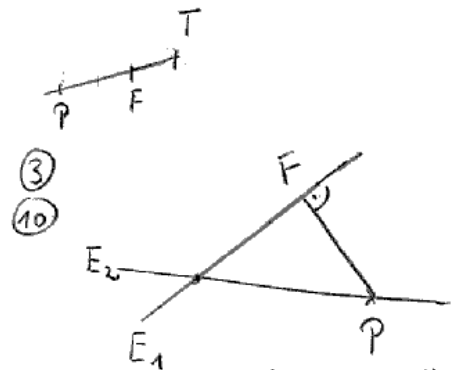
$$21 - 182 - 36\mu = 3 \Rightarrow 18 - 36\mu = 182$$

$$1 - 2\mu = 2$$

$$S: \vec{x} = \begin{pmatrix} 0 \\ -5 \\ -8 \end{pmatrix} + (1 - 2\mu) \begin{pmatrix} 2 \\ 4 \\ 9 \end{pmatrix} + \mu \begin{pmatrix} 2 \\ 4 \\ 18 \end{pmatrix}$$

$$\vec{x} = \begin{pmatrix} 2 \\ -1 \\ 1 \end{pmatrix} + \mu \begin{pmatrix} -2 \\ -4 \\ 0 \end{pmatrix}; \quad \left(\vec{x} = \begin{pmatrix} 0 \\ -5 \\ 1 \end{pmatrix} + \nu \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix} \right)$$

$$\begin{pmatrix} t_1 \\ t_2 \\ -2 \end{pmatrix} - \begin{pmatrix} 1 \\ -3 \\ -8 \end{pmatrix} = 2 \left[\begin{pmatrix} -3 \\ -1 \\ -4 \end{pmatrix} - \begin{pmatrix} t_1 \\ t_2 \\ -2 \end{pmatrix} \right] \Rightarrow \begin{aligned} t_1 - 1 &= 9 + 3t_1 \Rightarrow t_1 = -5 \\ t_2 + 3 &= 3 + 3t_2 \Rightarrow t_2 = 0 \\ -2 + 8 &= -4t_2 + 2t_2 \Rightarrow 2 = -3 \end{aligned}$$



$$\left[\begin{pmatrix} 0 \\ -5 \\ 1 \end{pmatrix} + \nu \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix} - \begin{pmatrix} -3 \\ -1 \\ -4 \end{pmatrix} \right] \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix} = 0$$

$$-10 + 5\nu + 5 = 0 \Rightarrow \nu = 1 \quad S(1|-3|1)$$

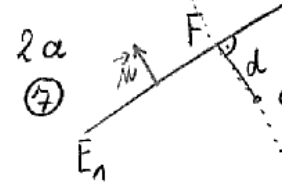
$$h_{SF}: \vec{x} = \begin{pmatrix} 1 \\ -3 \\ 1 \end{pmatrix} + \eta \begin{pmatrix} -4 \\ 2 \\ 5 \end{pmatrix}$$

$$1 \beta \quad P(1|-3|-8); P \in E_2$$

$$8 \quad E_2^N: \vec{x} \begin{pmatrix} -2 \\ 1 \\ 0 \end{pmatrix} = -5; \quad \begin{pmatrix} 1 \\ -3 \\ -8 \end{pmatrix} \begin{pmatrix} -2 \\ 1 \\ 0 \end{pmatrix} = -5 = -5 \Rightarrow P \in E_2$$

$$\text{Abstand } P \text{ von } E_1 \Rightarrow E_1^{\perp N}, \quad \frac{|\vec{p} \vec{n} - H|}{|\vec{n}|} = d$$

$$\frac{\begin{pmatrix} 1 \\ -3 \\ -8 \end{pmatrix} \begin{pmatrix} 2 \\ -1 \\ -2 \end{pmatrix} - 3}{\sqrt{2^2 + (-1)^2 + (-2)^2}} = d = \frac{18}{3} = 6$$



$$2 \alpha \quad 7$$

$$a) g: \vec{x} = \vec{p} + \gamma \vec{n}; g \cap E_1 \Rightarrow F$$

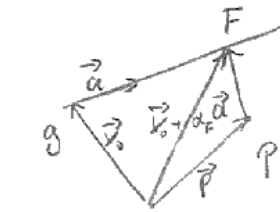
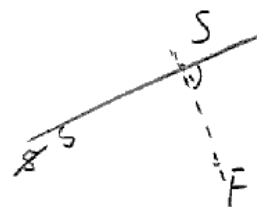
$$b) \vec{x}_F = \vec{p} - d \vec{n}; \quad \vec{x}_F = \begin{pmatrix} 1 \\ -3 \\ -8 \end{pmatrix} - \frac{6}{\sqrt{5}} \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix} = \begin{pmatrix} -3 \\ -1 \\ -4 \end{pmatrix}$$

$$2 \beta \quad 7 \quad T(t_1|t_2|-2) \text{ teilt } [PF]$$

$$\vec{AT} = 2 \vec{TB} \quad (\vec{T} - \vec{a}) = 2(\vec{b} - \vec{T})$$

$$\text{Hilfsebene } E_H^N: \vec{x} \cdot \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix} = \begin{pmatrix} -3 \\ -1 \\ 0 \end{pmatrix} \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix}$$

$$E_H^N \cap S \Rightarrow S$$



$$g: \vec{x} = \vec{x}_0 + \alpha \vec{a}; \quad [\vec{x}_0 + \alpha \vec{a} - \vec{p}] \vec{a} = 0$$