

SS 2009

$$g_1: \left(\begin{pmatrix} 0 \\ 1 \\ 3 \end{pmatrix} + \alpha \begin{pmatrix} 2 \\ 5 \\ 1 \end{pmatrix} \right); g_2: (3; -1; 0)^T; (4; 0; 1)^T$$

$$e: \begin{pmatrix} 0 \\ 1 \\ 3 \end{pmatrix} + \alpha \begin{pmatrix} 2 \\ 5 \\ 1 \end{pmatrix} + \beta \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$$

$$\begin{pmatrix} 3 & -4 \\ -1 & 0 \\ 0 & -1 \end{pmatrix} = \begin{pmatrix} -1 \\ -1 \\ -1 \end{pmatrix} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$$

$$\vec{n}: \begin{pmatrix} 2 \\ 5 \\ 1 \end{pmatrix} \times \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} = \begin{pmatrix} 5 - 1 \\ 1 - 2 \\ 2 - 5 \end{pmatrix} = \begin{pmatrix} 4 \\ -1 \\ -3 \end{pmatrix}$$

$$\left. \begin{array}{l} 4x - y - 3z = d \\ 0 - 1 - 9 = -10 = d \end{array} \right\} 4x - y - 3z = -10 =$$

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$$e_1 = 2x - y - 2z = 4$$

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$$-9x + 6(2x - 4) = -26$$

$$3x - 24 = -26$$

$$x = -2/3$$

$$y = 2 - 2/3 - 4 = -16/3$$

$$\begin{pmatrix} -2/3 \\ -16/3 \\ 0 \end{pmatrix} + \alpha \begin{pmatrix} 5 \\ 4 \\ 3 \end{pmatrix}$$

a)

$$e_2: \begin{pmatrix} 3 \\ -1 \\ 1 \end{pmatrix} + \alpha \begin{pmatrix} 4 - 3 \\ -3 + 1 \\ 4 - 1 \end{pmatrix} + \beta \begin{pmatrix} 5 - 3 \\ ? + 1 \\ 1 - 1 \end{pmatrix}$$

$$e_2 \begin{pmatrix} 3 \\ -1 \\ 1 \end{pmatrix} + \alpha \begin{pmatrix} 1 \\ -2 \\ 3 \end{pmatrix} + \beta \begin{pmatrix} 2 \\ ? \\ 0 \end{pmatrix}$$

$$\vec{w} : \begin{pmatrix} 1 \\ -2 \\ 3 \end{pmatrix} \times \begin{pmatrix} 2 \\ ? \\ 0 \end{pmatrix} = \begin{pmatrix} 0 - 9 \\ 6 - 0 \\ 3 + 4 \end{pmatrix} = \begin{pmatrix} -9 \\ 6 \\ 7 \end{pmatrix}$$

$$\left. \begin{array}{l} -9x + 6y + 7z = \alpha \\ -27 - 6 + 7 = -26 \end{array} \right\} -9x + 6y + 7z = -26$$

$$b) \begin{pmatrix} 2 \\ -1 \\ -2 \end{pmatrix} \times \begin{pmatrix} -9 \\ 6 \\ 7 \end{pmatrix} = \begin{pmatrix} -2 + 17 \\ 18 - 14 \\ 17 - 9 \end{pmatrix} = \begin{pmatrix} 5 \\ 4 \\ 3 \end{pmatrix}$$

$$\left| \begin{array}{l} 2x - y - 2z = 4 \\ -9x + 6y + 7z = -26 \end{array} \right|$$

$$z = 0$$

$$2x - y = 4$$

$$y = 2x - 4$$

$$-9x + 6y = -26$$

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2008 $(1 -2 2)^T$ $(3 -2 1)^T$ $(7 0 -1)^T$

a) $\begin{pmatrix} 1 \\ -2 \\ 2 \end{pmatrix} + \alpha \begin{pmatrix} 3 \\ -2 \\ 1 \end{pmatrix} + \lambda \begin{pmatrix} -1 \\ 2 \\ -1 \end{pmatrix} = \begin{pmatrix} 1 \\ -2 \\ 2 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 0 \\ -1 \end{pmatrix}$

b) $\begin{pmatrix} 1 \\ -2 \\ 2 \end{pmatrix} + \alpha \begin{pmatrix} ? \\ 0 \\ -1 \end{pmatrix} = \begin{pmatrix} 7 \\ 0 \\ -1 \end{pmatrix}$ ← soll nicht
 $-2 + \alpha \cdot 0 = 0$

$$\begin{array}{lcl} 2\alpha & = & 6 \quad \Rightarrow \alpha = 3 \\ 0\alpha & = & 2 \quad \alpha = ? \\ -1\alpha & = & -3 \quad \alpha = 3 \end{array}$$

Kl. B

$$d = \frac{|\vec{s} \times (\vec{q} - \vec{p}_0)|}{|\vec{s}|} = \frac{\left| \begin{pmatrix} 2 \\ 0 \\ -1 \end{pmatrix} \times \begin{pmatrix} 7-1 \\ 0-(-2) \\ -1-2 \end{pmatrix} \right|}{\sqrt{4+0+1}} = \frac{\left| \begin{pmatrix} 2 \\ 0 \\ -1 \end{pmatrix} \times \begin{pmatrix} 6 \\ 2 \\ -3 \end{pmatrix} \right|}{\sqrt{5}}$$

$$\frac{1}{\sqrt{5}} \cdot \left| \begin{pmatrix} 2 \\ 0 \\ 4 \end{pmatrix} \right| = \frac{1}{\sqrt{5}} \cdot \sqrt{20} = \sqrt{4} = \underline{\underline{2}}$$