

VG TB14 7E, 19.10.2016

- ① $\vec{g} \parallel xz$ -Ebene $P(-5|0|1)$ in xz -Ebene
 g liegt in xz -Ebene (Seitenrissebene)

- ② $\vec{g} = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} \parallel y$ -Achse
 $P(0|-3|-3)$ in yz -Ebene
 $P \notin y$ -Achse
 g ist parallel zu y -Achse in yz -Ebene
(nicht identisch mit...)

- ③ $A(10|2|4), B(2|4|2)$

$$g = \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \vec{r}_A + s \cdot \vec{AB} =$$

$$\vec{AB} = \begin{pmatrix} -8 \\ 2 \\ -2 \end{pmatrix} \rightarrow \begin{pmatrix} 4 \\ -1 \\ 1 \end{pmatrix}$$

$$g : \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 10 \\ 2 \\ 4 \end{pmatrix} + s \begin{pmatrix} 4 \\ -1 \\ 1 \end{pmatrix}$$

$$s_1 (2|6|0)$$

$$s_2 (0|6.5|-0.5)$$

$$s_3 (26|0|6)$$

$$s_2 (0|\frac{9}{2}|\frac{3}{2})$$

$$s_3 (18|0|6)$$

$$s_4 (-6|6|0)$$

$$P(34|-4|10)$$

1P.

1P.

2P.

(4) windschief; weder parallel noch schneidend

(5) $S(-7/7/-7)$; $\varphi \approx 24.5336377$
 $\approx \underline{\underline{24.53^\circ}}$

(6) $\vec{r}_B = \vec{r}_R + \vec{RB}$; $\vec{RB} = \frac{1}{2}\vec{AB} = \frac{1}{2}(\vec{QR} + \vec{RS})$
 $= \frac{1}{2}(\vec{r}_R - \vec{r}_Q + \vec{r}_S - \vec{r}_R)$
 $= \frac{1}{2}(\cancel{2\vec{r}_R} - \vec{r}_Q + \vec{r}_S)$

~~$\vec{r}_B = \vec{r}_R + \vec{r}_R - \frac{1}{2}\vec{r}_Q - \frac{1}{2}\vec{r}_R$~~

~~$\vec{r}_B = 2\vec{r}_R - \frac{1}{2}\vec{r}_Q - \frac{1}{2}\vec{r}_R$~~

$\vec{r}_B = \vec{r}_R + \frac{1}{2}(\vec{r}_R - \vec{r}_Q + \vec{r}_S - \vec{r}_R)$
 $= \vec{r}_R - \frac{1}{2}\vec{r}_Q + \frac{1}{2}\vec{r}_S$

~~$\vec{r}_S = \vec{r}_R + \vec{QP} = \vec{r}_R + \vec{r}_P - \vec{r}_Q$~~

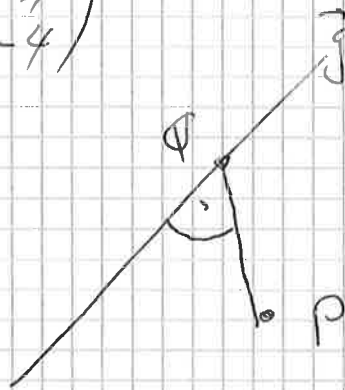
~~$\vec{r}_S = \vec{r}_R + \vec{QR} = \vec{r}_R + \vec{r}_P - \vec{r}_Q$~~

$\vec{r}_B = \vec{r}_R + \frac{1}{2}\vec{AB}$; $\vec{AB} = \vec{QP} + \vec{QR}$
 $= \vec{r}_R + \frac{1}{2}(\vec{r}_P - \vec{r}_Q + \vec{r}_P - \vec{r}_Q)$
 $= \underline{\underline{\frac{3}{2}\vec{r}_R + \frac{1}{2}\vec{r}_P - \vec{r}_Q}}$

$$(7) \quad P(1/7/2)$$

$$\vec{g} = \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} -3 \\ 8 \\ 1 \end{pmatrix} + s \begin{pmatrix} 2 \\ 1 \\ -4 \end{pmatrix}$$

$$\vec{g} \perp \vec{PQ}$$
$$\vec{g} \cdot \vec{PQ} = 0$$



$$\begin{pmatrix} 2 \\ 1 \\ -4 \end{pmatrix} \cdot \begin{pmatrix} 2s-4 \\ s+1 \\ -4s-1 \end{pmatrix} = 0$$

$$21s = 3$$

$$s = \frac{3}{21} = \frac{1}{7}$$

$$Q \left(-\frac{19}{7} \mid \frac{57}{7} \mid \frac{3}{7} \right)$$

