

b) E: $x_1 + x_2 + x_3 = 6$

$Q_4 Q_1: \vec{x} = \begin{pmatrix} 0 \\ 0 \\ 3 \end{pmatrix} + \lambda \begin{pmatrix} 4 \\ 0 \\ 0 \end{pmatrix}$

$Q_4 Q_3: \vec{x} = \begin{pmatrix} 0 \\ 0 \\ 3 \end{pmatrix} + \mu \begin{pmatrix} 0 \\ 5 \\ 0 \end{pmatrix}$

E \cap $Q_4 Q_1$ $\begin{cases} 4\lambda + 3 = 6 \\ 4\lambda = 3 \\ \lambda = \frac{3}{4} \end{cases}$

A(3|0|3)

E \cap $Q_4 Q_3$: $\begin{cases} 5\mu + 3 = 6 \\ 5\mu = 3 \\ \mu = \frac{3}{5} \end{cases}$

B(0|3|3)

E \cap $x_1 + x_2$ - Ebene = {h}

~~$x_3 = 0$~~ $\begin{matrix} S_1(6|0|0|1) \\ S_2(0|6|0) \end{matrix} \Rightarrow \text{lin. } \vec{x} = \begin{pmatrix} 6 \\ 0 \\ 0 \end{pmatrix} + \lambda \begin{pmatrix} -6 \\ 6 \\ 0 \end{pmatrix}$

$\vec{x} = \begin{pmatrix} 6 \\ 0 \\ 0 \end{pmatrix} + \mu \begin{pmatrix} -1 \\ 1 \\ 0 \end{pmatrix}$

$|C_1 \vec{A}| = |A \vec{B}|$

$A \vec{B} = \begin{pmatrix} -3 \\ 3 \\ 0 \end{pmatrix}$

$|A \vec{B}| = \sqrt{18} = 3\sqrt{2}$

$|C_2 \vec{A}| = |A \vec{B}|$

$|C_1 \vec{A}| = \left| \begin{pmatrix} 3 & -6 + \lambda' \\ 0 & -\lambda' \\ 3 & -\lambda' \end{pmatrix} \right| = \left| \begin{pmatrix} -3 + \lambda' \\ -\lambda' \\ 3 \end{pmatrix} \right| = \sqrt{9 - 6\lambda' + \lambda'^2 + \lambda'^2 + 9}$

$= \sqrt{2\lambda'^2 - 6\lambda' + 18}$

$2\lambda'^2 - 6\lambda' + 18 = 18$; $2\lambda'^2 - 6\lambda' = 0$

~~$2\lambda'^2 - 6\lambda' + 18 =$~~

$2\lambda'(\lambda' - 3) = 0$

$\lambda'_1 = 0$ $\lambda'_2 = 3$

~~$C_1(3|0|3)$~~

$C_1(6|0|0)$

$C_2(3|3|0)$