

$$g_1: \vec{x} = \begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + r \cdot \begin{pmatrix} b_1 \\ b_2 \end{pmatrix} \quad \vec{c} = \begin{pmatrix} c_1 \\ c_2 \end{pmatrix}$$

$$c_1 = a_1 + r \cdot b_1$$

$$c_2 = a_2 + r \cdot b_2$$

$$\begin{cases} c_1 - a_1 = r \cdot b_1 \\ c_2 - a_2 = r \cdot b_2 \end{cases}$$

Liegt c auf  $g_1$

$$\begin{cases} \frac{c_1 - a_1}{b_1} = r \\ \frac{c_2 - a_2}{b_2} = r \end{cases}$$

$$\vec{a} = \begin{pmatrix} a_1 \\ a_2 \end{pmatrix} \quad \vec{b} = \begin{pmatrix} b_1 \\ b_2 \end{pmatrix}$$

$$\begin{cases} a_1 = r \cdot b_1 \\ a_2 = r \cdot b_2 \end{cases}$$

$$\begin{cases} \frac{a_1}{b_1} = r \\ \frac{a_2}{b_2} = r \end{cases}$$



$$g_1: \vec{x} = \begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + r \cdot \begin{pmatrix} b_1 \\ b_2 \end{pmatrix}$$

$$g_2: \vec{x} = \begin{pmatrix} c_1 \\ c_2 \end{pmatrix} + s \cdot \begin{pmatrix} d_1 \\ d_2 \end{pmatrix}$$

$$\begin{pmatrix} a_1 \\ a_2 \end{pmatrix} + r \cdot \begin{pmatrix} b_1 \\ b_2 \end{pmatrix} = \begin{pmatrix} c_1 \\ c_2 \end{pmatrix} + s \cdot \begin{pmatrix} d_1 \\ d_2 \end{pmatrix}$$

$$a_1 + r \cdot b_1 = c_1 + s \cdot d_1$$

$$a_2 + r \cdot b_2 = c_2 + s \cdot d_2$$

$$r \cdot b_1 - s \cdot d_1 = c_1 - a_1 \quad | : b_1$$

$$r \cdot b_2 - s \cdot d_2 = c_2 - a_2 \quad | : b_2$$

$$I \quad \left| r - s \cdot \frac{d_1}{b_1} = \frac{c_1 - a_1}{b_1} \right|$$

$$II \quad \left| r - s \cdot \frac{d_2}{b_2} = \frac{c_2 - a_2}{b_2} \right|$$

$$I - II \quad -s \cdot \frac{d_1}{b_1} + s \cdot \frac{d_2}{b_2} = \frac{c_1 - a_1}{b_1} - \frac{c_2 - a_2}{b_2}$$

$$s \cdot \left( -\frac{d_1}{b_1} + \frac{d_2}{b_2} \right) = \frac{c_1 - a_1}{b_1} - \frac{c_2 - a_2}{b_2}$$

$$s \cdot \left( -\frac{d_1 b_2 + d_2 b_1}{b_1 b_2} \right) = \frac{c_1 b_2 - a_1 b_2}{b_1 b_2} - \frac{c_2 b_1 - a_2 b_1}{b_1 b_2}$$

$$s \cdot \left( \frac{-b_2 d_1 + b_1 d_2}{b_1 b_2} \right) = \frac{b_2 c_1 - a_1 b_2 - b_1 c_2 + a_2 b_1}{b_1 b_2}$$



$$S = \frac{b_2 c_1 - a_1 b_2 - b_1 c_2 + a_2 b_1}{\cancel{b_1 b_2}} \cdot \frac{\cancel{b_1 b_2}}{-b_2 d_1 + b_1 d_2}$$

$$S = \frac{b_2 c_1 - a_1 b_2 - b_1 c_2 + a_2 b_1}{-b_2 d_1 + b_1 d_2}$$

$$S = \frac{b_1 c_0 - a_0 b_1 - b_0 c_1 + a_1 b_0}{-1 \cdot b_1 d_0 + b_0 d_1}$$