

$$\vec{a} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} \quad \vec{b} = \begin{pmatrix} 4 \\ -5 \\ -6 \end{pmatrix}$$

$$\vec{c} = \vec{a} \times \vec{b} = \begin{array}{|ccc|} \hline & X & \\ \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} & \begin{pmatrix} 4 \\ -5 \\ -6 \end{pmatrix} & \begin{pmatrix} 2 \cdot (-6) - 3 \cdot (-5) \\ 3 \cdot 4 - 1 \cdot (-6) \\ 1 \cdot (-5) - 2 \cdot 4 \end{pmatrix} = \begin{pmatrix} -12 - (-15) \\ 12 - (-6) \\ (-5) - 8 \end{pmatrix} = \begin{pmatrix} 3 \\ 18 \\ -3 \end{pmatrix} \\ \cancel{\begin{array}{ccc} 1 & 4 & \\ 2 & -5 & \\ 3 & -6 & \end{array}} & \cancel{\begin{array}{ccc} 1 & 4 & \\ 2 & -5 & \\ 3 & -6 & \end{array}} & \cancel{\begin{array}{ccc} 2 & -5 & \\ 3 & -6 & \end{array}} \\ \hline \end{array}$$

$$\vec{a} \cdot \vec{c} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} \cdot \begin{pmatrix} 3 \\ 18 \\ -3 \end{pmatrix} = 3 + 36 - 9 = 0$$

$$\vec{b} \cdot \vec{c} = \begin{pmatrix} 4 \\ -5 \\ -6 \end{pmatrix} \cdot \begin{pmatrix} 3 \\ 18 \\ -3 \end{pmatrix} = 12 - 90 + 78 = 0$$

$$\vec{a} = \begin{pmatrix} 2 \\ -5 \\ 1 \end{pmatrix} \quad \vec{b} = \begin{pmatrix} -3 \\ 4 \\ 7 \end{pmatrix}$$

$$\vec{c} = \vec{a} \times \vec{b} = \begin{array}{|ccc|} \hline & X & \\ \begin{pmatrix} 2 \\ -5 \\ 1 \end{pmatrix} & \begin{pmatrix} -3 \\ 4 \\ 7 \end{pmatrix} & \begin{pmatrix} (-5) \cdot 7 - 1 \cdot 4 \\ 1 \cdot (-3) - 2 \cdot 7 \\ 2 \cdot 4 - (-5) \cdot (-3) \end{pmatrix} = \begin{pmatrix} (-35) - 4 \\ (-3) - 14 \\ 8 - 15 \end{pmatrix} = \begin{pmatrix} -39 \\ -17 \\ -7 \end{pmatrix} \\ \cancel{\begin{array}{ccc} 2 & -3 & \\ -5 & 4 & \\ 1 & 7 & \end{array}} & \cancel{\begin{array}{ccc} 2 & -3 & \\ -5 & 4 & \\ 1 & 7 & \end{array}} & \cancel{\begin{array}{ccc} -3 & 4 & \\ 7 & & \end{array}} \\ \hline \end{array}$$

$$\vec{a} \cdot \vec{c} = \begin{pmatrix} 2 \\ -5 \\ 1 \end{pmatrix} \cdot \begin{pmatrix} -39 \\ -17 \\ -7 \end{pmatrix} = (-78) + 85 - 7 = 0$$

$$\vec{b} \cdot \vec{c} = \begin{pmatrix} -3 \\ 4 \\ 7 \end{pmatrix} \cdot \begin{pmatrix} -39 \\ -17 \\ -7 \end{pmatrix} = 117 - 68 - 49 = 0$$

$$A = \frac{1}{2} \cdot \left| \overrightarrow{AC} \times \overrightarrow{AB} \right| = \frac{1}{2} \cdot \begin{vmatrix} -2 & -4 \\ 1 & 4 \\ -2 & -4 \\ 1 & 4 \\ -1 & 8 \end{vmatrix} = \frac{1}{2} \cdot \begin{vmatrix} 1 \cdot (-8) - 1 \cdot 4 \\ 1 \cdot (-4) - (-2) \cdot (-8) \\ (-2) \cdot 4 - 1 \cdot (-4) \end{vmatrix} = \frac{1}{2} \cdot \begin{pmatrix} -12 \\ -20 \\ -4 \end{pmatrix} =$$

$$\frac{1}{2} \cdot \sqrt{12^2 + 20^2 + 4^2} = 11,8322$$

$$g_1: \vec{x} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} + k \cdot \begin{pmatrix} 3 \\ 4 \\ -5 \end{pmatrix}$$

$$g_2: \vec{x} = \begin{pmatrix} 3 \\ 4 \\ -6 \end{pmatrix} + k \cdot \begin{pmatrix} -5 \\ -6 \\ 1 \end{pmatrix}$$

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Stützvektor Parameter Richtungsvektor