

5 Man zeige, dass die Gerade **h** durch die Punkte A und B und die Gerade **k** durch C und D sich in einem Punkt S schneiden.

Man bestimme den Winkel zwischen **h** und **k**.

A1	A	$\begin{bmatrix} 1,0 & 3,0 & 2,0 \end{bmatrix}$	Ergebnisse	$g(AB): X = \begin{bmatrix} 1,0 \\ 3,0 \\ 2,0 \end{bmatrix} + r \begin{bmatrix} 1,0 \\ 5,0 \\ 3,0 \end{bmatrix}$	$r = 1,00$
	B	$\begin{bmatrix} 2,0 & 8,0 & 5,0 \end{bmatrix}$			$s = 1,00$
	C	$\begin{bmatrix} 8,0 & 13,0 & 6,0 \end{bmatrix}$		$g(CD): X = \begin{bmatrix} 8,0 \\ 13,0 \\ 6,0 \end{bmatrix} + s \begin{bmatrix} -6,0 \\ -5,0 \\ -1,0 \end{bmatrix}$	S $\begin{bmatrix} 2 & 8 & 5 \end{bmatrix}$
	D	$\begin{bmatrix} 2,0 & 8,0 & 5,0 \end{bmatrix}$			alfa 136,9
A2	A	$\begin{bmatrix} 2,0 & 8,0 & 5,0 \end{bmatrix}$	Ergebnisse	$g(AB): X = \begin{bmatrix} 2,0 \\ 8,0 \\ 5,0 \end{bmatrix} + r \begin{bmatrix} 7,0 \\ 10,0 \\ 4,0 \end{bmatrix}$	$r = 1,00$
	B	$\begin{bmatrix} 9,0 & 18,0 & 9,0 \end{bmatrix}$			$s = 0,50$
	C	$\begin{bmatrix} 15,0 & 23,0 & 10,0 \end{bmatrix}$		$g(CD): X = \begin{bmatrix} 15,0 \\ 23,0 \\ 10,0 \end{bmatrix} + s \begin{bmatrix} -12,0 \\ -10,0 \\ -2,0 \end{bmatrix}$	S $\begin{bmatrix} 9 & 18 & 9 \end{bmatrix}$
	D	$\begin{bmatrix} 3,0 & 13,0 & 8,0 \end{bmatrix}$			alfa 161,6
A3	A	$\begin{bmatrix} 1,0 & 5,0 & 3,0 \end{bmatrix}$	Ergebnisse	$g(AB): X = \begin{bmatrix} 1,0 \\ 5,0 \\ 3,0 \end{bmatrix} + r \begin{bmatrix} 6,0 \\ 5,0 \\ 1,0 \end{bmatrix}$	$r = 1,00$
	B	$\begin{bmatrix} 7,0 & 10,0 & 4,0 \end{bmatrix}$			$s = 0,33$
	C	$\begin{bmatrix} 8,0 & 15,0 & 7,0 \end{bmatrix}$		$g(CD): X = \begin{bmatrix} 8,0 \\ 15,0 \\ 7,0 \end{bmatrix} + s \begin{bmatrix} -3,0 \\ -15,0 \\ -9,0 \end{bmatrix}$	S $\begin{bmatrix} 7 & 10 & 4 \end{bmatrix}$
	D	$\begin{bmatrix} 5,0 & 0,0 & -2,0 \end{bmatrix}$			alfa 136,9
A4	A	$\begin{bmatrix} -1,0 & -5,0 & -3,0 \end{bmatrix}$	Ergebnisse	$g(AB): X = \begin{bmatrix} -1,0 \\ -5,0 \\ -3,0 \end{bmatrix} + r \begin{bmatrix} -6,0 \\ -5,0 \\ -1,0 \end{bmatrix}$	$r = 1,00$
	B	$\begin{bmatrix} -7,0 & -10,0 & -4,0 \end{bmatrix}$			$s = 0,25$
	C	$\begin{bmatrix} -6,0 & -5,0 & -1,0 \end{bmatrix}$		$g(CD): X = \begin{bmatrix} -6,0 \\ -5,0 \\ -1,0 \end{bmatrix} + s \begin{bmatrix} -4,0 \\ -20,0 \\ -12,0 \end{bmatrix}$	S $\begin{bmatrix} -7 & -10 & -4 \end{bmatrix}$
	D	$\begin{bmatrix} -10,0 & -25,0 & -13,0 \end{bmatrix}$			alfa 43,1

Ergebnisse

- A5**
- A $\begin{bmatrix} -7,0 & -12,0 & -5,0 \end{bmatrix}$
- B $\begin{bmatrix} -18,0 & -17,0 & -4,0 \end{bmatrix}$
- C $\begin{bmatrix} -12,0 & -12,0 & -3,0 \end{bmatrix}$
- D $\begin{bmatrix} -18,0 & -17,0 & -4,0 \end{bmatrix}$

$$g(AB): X = \begin{pmatrix} -7,0 \\ -12,0 \\ -5,0 \end{pmatrix} + r \begin{pmatrix} -11,0 \\ -5,0 \\ 1,0 \end{pmatrix} \quad \begin{matrix} r = 1,00 \\ s = 1,00 \end{matrix}$$

$$g(CD): X = \begin{pmatrix} -12,0 \\ -12,0 \\ -3,0 \end{pmatrix} + s \begin{pmatrix} -6,0 \\ -5,0 \\ -1,0 \end{pmatrix} \quad \begin{matrix} S \begin{bmatrix} -18 & -17 & -4 \end{bmatrix} \\ \text{alfa } 19,5 \end{matrix}$$

Ergebnisse

- A6**
- A $\begin{bmatrix} -11,0 & -7,0 & 0,0 \end{bmatrix}$
- B $\begin{bmatrix} -10,0 & -2,0 & 3,0 \end{bmatrix}$
- C $\begin{bmatrix} -4,0 & 3,0 & 4,0 \end{bmatrix}$
- D $\begin{bmatrix} -16,0 & -7,0 & 2,0 \end{bmatrix}$

$$g(AB): X = \begin{pmatrix} -11,0 \\ -7,0 \\ 0,0 \end{pmatrix} + r \begin{pmatrix} 1,0 \\ 5,0 \\ 3,0 \end{pmatrix} \quad \begin{matrix} r = 1,00 \\ s = 0,50 \end{matrix}$$

$$g(CD): X = \begin{pmatrix} -4,0 \\ 3,0 \\ 4,0 \end{pmatrix} + s \begin{pmatrix} -12,0 \\ -10,0 \\ -2,0 \end{pmatrix} \quad \begin{matrix} S \begin{bmatrix} -10 & -2 & 3 \end{bmatrix} \\ \text{alfa } 136,9 \end{matrix}$$

Ergebnisse

- A7**
- A $\begin{bmatrix} -4,0 & 5,0 & 5,0 \end{bmatrix}$
- B $\begin{bmatrix} 8,0 & 15,0 & 7,0 \end{bmatrix}$
- C $\begin{bmatrix} 4,0 & 20,0 & 12,0 \end{bmatrix}$
- D $\begin{bmatrix} 20,0 & 0,0 & -8,0 \end{bmatrix}$

$$g(AB): X = \begin{pmatrix} -4,0 \\ 5,0 \\ 5,0 \end{pmatrix} + r \begin{pmatrix} 12,0 \\ 10,0 \\ 2,0 \end{pmatrix} \quad \begin{matrix} r = 1,00 \\ s = 0,25 \end{matrix}$$

$$g(CD): X = \begin{pmatrix} 4,0 \\ 20,0 \\ 12,0 \end{pmatrix} + s \begin{pmatrix} 16,0 \\ -20,0 \\ -20,0 \end{pmatrix} \quad \begin{matrix} S \begin{bmatrix} 8 & 15 & 7 \end{bmatrix} \\ \text{alfa } 95,4 \end{matrix}$$

Ergebnisse

- A8**
- A $\begin{bmatrix} 11,0 & 5,0 & -1,0 \end{bmatrix}$
- B $\begin{bmatrix} 5,0 & 0,0 & -2,0 \end{bmatrix}$
- C $\begin{bmatrix} 1,0 & 5,0 & 3,0 \end{bmatrix}$
- D $\begin{bmatrix} 3,0 & 2,5 & 0,5 \end{bmatrix}$

$$g(AB): X = \begin{pmatrix} 11,0 \\ 5,0 \\ -1,0 \end{pmatrix} + r \begin{pmatrix} -6,0 \\ -5,0 \\ -1,0 \end{pmatrix} \quad \begin{matrix} r = 1,00 \\ s = 2,00 \end{matrix}$$

$$g(CD): X = \begin{pmatrix} 1,0 \\ 5,0 \\ 3,0 \end{pmatrix} + s \begin{pmatrix} 2,0 \\ -2,5 \\ -2,5 \end{pmatrix} \quad \begin{matrix} S \begin{bmatrix} 5 & 0 & -2 \end{bmatrix} \\ \text{alfa } 84,6 \end{matrix}$$