Remer Wisnupatra Basri Th 2.UB

Aufgabe 6

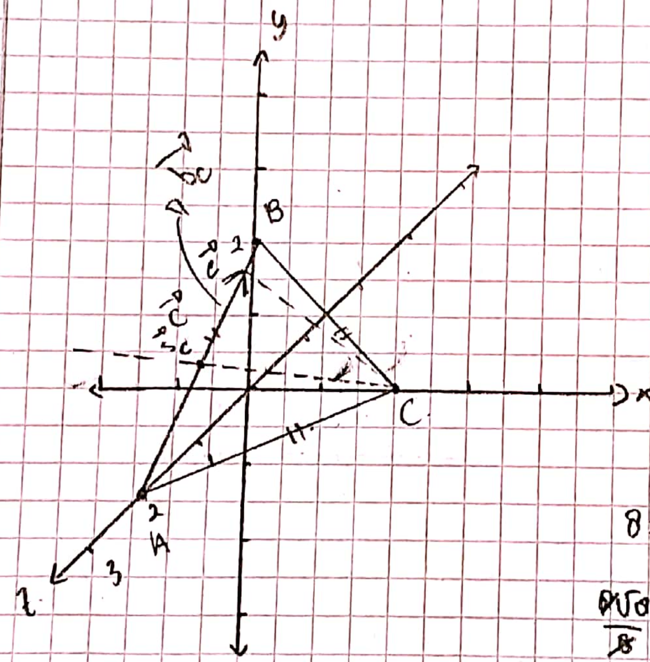
(a) A(0;0;2), B(0;2;0), C(2;0;0)

(i) $\vec{c}: \vec{AB} = \begin{pmatrix}0\\2\\0\end{pmatrix} - \begin{pmatrix}0\\0\\2\end{pmatrix} = \begin{pmatrix}0\\2\\-2\end{pmatrix} = \sqrt{8} \rightarrow \|\vec{AB}\|$

$\vec{a} = \vec{BC} : \begin{pmatrix}2\\0\\0\end{pmatrix} - \begin{pmatrix}0\\2\\0\end{pmatrix} = \begin{pmatrix}2\\-2\\0\end{pmatrix} = \sqrt{8} \rightarrow \|\vec{BC}\|$

$\vec{b} = \vec{AC} : \begin{pmatrix}2\\0\\0\end{pmatrix} - \begin{pmatrix}0\\0\\2\end{pmatrix} = \begin{pmatrix}2\\0\\-2\end{pmatrix} = \sqrt{8} = \|\vec{AC}\|$

ii).



$\vec{s_c}$ = Seitenhalbierenden AB.

$\hookrightarrow \frac{1}{2}\begin{pmatrix}0\\2\\-2\end{pmatrix} = \begin{pmatrix}0\\1\\-1\end{pmatrix}$ = oder $\vec{d}$

$\vec{Cd} : \begin{pmatrix}0\\1\\-1\end{pmatrix} - \begin{pmatrix}2\\0\\0\end{pmatrix} = \begin{pmatrix}-2\\1\\-1\end{pmatrix}$

$|\vec{Cd}| = \sqrt{2^2+1^2+2^2}$

$= \sqrt{6}$ LE.

$8 = x \cdot \sqrt{8}$

$\frac{8\sqrt{8}}{8} = 2\sqrt{2}$

(iii) $\vec{e} = (x,y,z) \in \vec{AB} \rightarrow \vec{Ce} = (x-2, y, z)$

$\vec{CH} \perp \vec{AB}$

$\vec{CH} \cdot \vec{AB} = 0$

$(x-2)\cdot 0 + 2y - 2z = 0$

$2y = +2z$

$y = z$

$x - 2 + 2y - 2z = 0$

$x = 2$

iv) $A = \frac{1}{2}\|\vec{a}\|\|\vec{b}\| \cdot \sin 60^\circ$

$= \frac{1}{2} \cdot \sqrt{8} \cdot \sqrt{8} \cdot \frac{\sqrt{3}}{2}$

$= 2\sqrt{3}$ FE

Orthogonalprojektion $\vec{b_c}$ des Vektors $\bar{b}$ auf den $\bar{c}$

$\vec{b_c} = \frac{\bar{b} \cdot \bar{c}}{|\bar{c}|^2} \cdot \vec{c}$

$= \frac{0 \cdot 2 + 2 \cdot 0 + 0 \cdot 2 + (-2 \cdot -2)}{(\sqrt{8})^2} \cdot \begin{pmatrix}0\\2\\-2\end{pmatrix}$

$= \frac{4}{8}\begin{pmatrix}0\\2\\-2\end{pmatrix}$

$\vec{b_c} = \begin{pmatrix}0\\1\\-1\end{pmatrix}$

$|\vec{b_c}| = \frac{\bar{b} \cdot \bar{c}}{|\bar{c}|}$

$= \frac{4}{\sqrt{8}}$

$= \frac{1}{2}\sqrt{8}$

$= \sqrt{2}$

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