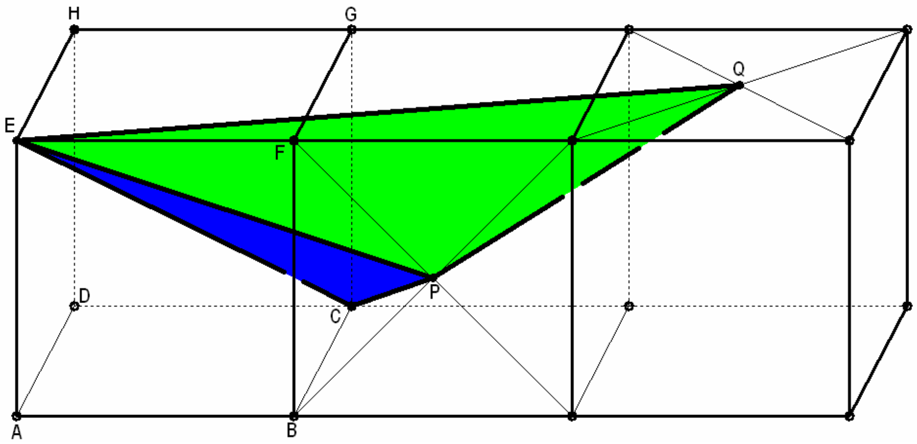
Bsp.77

$A(2|0|0)$
$C(0|2|0)$
$D(0|0|0)$
$E(2|0|2)$
$P(2|3|1)$
$Q(1|5|2)$



Gesucht: Winkel zw. ΔCPE und ΔEPQ

$\overrightarrow{n_{\Delta\text{CPE}}} = \overrightarrow{PC} \times \overrightarrow{PE}$

$\overrightarrow{PC} = \begin{pmatrix} -2 \\ -1 \\ -1 \end{pmatrix}$

$\overrightarrow{PE} = \begin{pmatrix} 0 \\ -3 \\ 1 \end{pmatrix}$

$\begin{pmatrix} -2 \\ -1 \\ -1 \end{pmatrix} \times \begin{pmatrix} 0 \\ -3 \\ 1 \end{pmatrix} = \begin{pmatrix} -4 \\ 2 \\ 6 \end{pmatrix}$

$\overrightarrow{n_{\Delta\text{CPE}}} = \begin{pmatrix} -4 \\ 2 \\ 6 \end{pmatrix}$

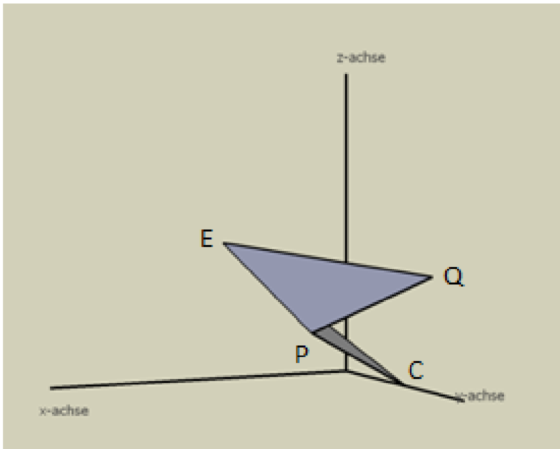
$\overrightarrow{n_{\Delta\text{EPQ}}} = \overrightarrow{PQ} \times \overrightarrow{PE}$

$\overrightarrow{PQ} = \begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix}$

$\overrightarrow{PE} = \begin{pmatrix} 0 \\ -3 \\ 1 \end{pmatrix}$

$\begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix} \times \begin{pmatrix} 0 \\ -3 \\ 1 \end{pmatrix} = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$

$\overrightarrow{n_{\Delta\text{EPQ}}} = \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix}$



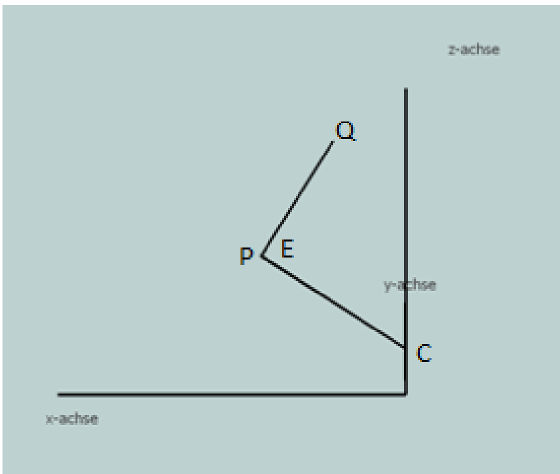
Vermutung: Dreiecke stehen aufeinander normal

Z.z: $\overrightarrow{n_{\Delta\text{CPE}}} \cdot \overrightarrow{n_{\Delta\text{EPQ}}} = 0$

$\begin{pmatrix} -4 \\ 2 \\ 6 \end{pmatrix} \cdot \begin{pmatrix} 5 \\ 1 \\ 3 \end{pmatrix} = 0$

-20+2+18=0

$\Rightarrow \Delta CPE \perp \Delta EPQ$



Mr. Foleys Behauptung stimmt nicht.

Der Winkel beträgt exakt 90°.