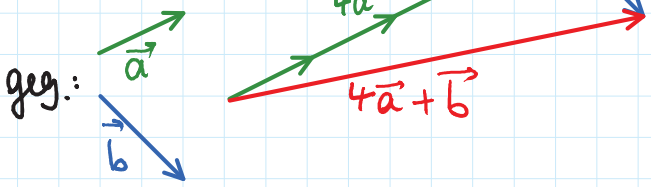
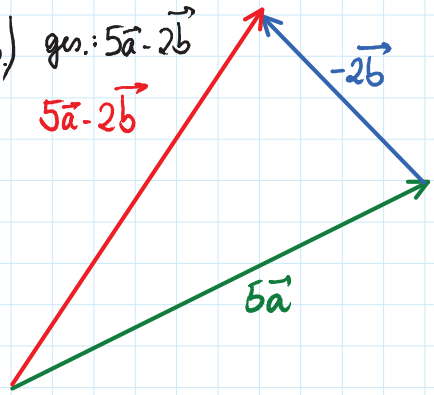
HA auf Di, 8. April 2014

S.239 ① a.) ges.: $4\vec{a}+\vec{b}$

geg.:

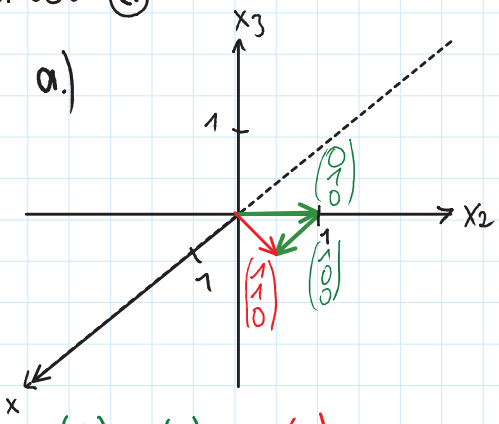


b.) ges.: $5\vec{a}-2\vec{b}$

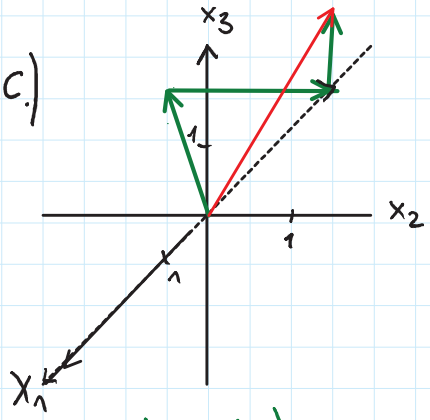


S.239 ②

a.)



c.)



a) $\begin{pmatrix}0\\1\\0\end{pmatrix}+\begin{pmatrix}1\\0\\0\end{pmatrix}=\begin{pmatrix}1\\1\\0\end{pmatrix}$

c) $\begin{pmatrix}1\\0\\2\end{pmatrix}+\begin{pmatrix}0\\2\\0\end{pmatrix}+\begin{pmatrix}0\\0\\1\end{pmatrix}=\begin{pmatrix}1\\2\\3\end{pmatrix}$

S.244 ①

geg.: $\vec{a}=\begin{pmatrix}1\\0\\2\end{pmatrix}$; $\vec{b}=\begin{pmatrix}3\\-2\\1\end{pmatrix}$; $\vec{d}=\begin{pmatrix}0{,}2\\0{,}2\\0{,}1\end{pmatrix}=\begin{pmatrix}\frac{1}{5}\\\frac{1}{5}\\\frac{1}{10}\end{pmatrix}$; $\vec{e}=\begin{pmatrix}\sqrt{2}\\\sqrt{3}\\\sqrt{5}\end{pmatrix}$

$|\vec{a}|=\sqrt{1^2+2^2}=\sqrt{5}$;

$\vec{a}_0=\frac{1}{\sqrt{5}}\begin{pmatrix}1\\0\\2\end{pmatrix}=\begin{pmatrix}\frac{1}{\sqrt{5}}\\0\\\frac{2}{\sqrt{5}}\end{pmatrix}$

$|\vec{b}|=\sqrt{14}$;

$\vec{b}_0=\begin{pmatrix}\frac{3}{\sqrt{14}}\\-\frac{2}{\sqrt{14}}\\\frac{1}{\sqrt{14}}\end{pmatrix}$

$|\vec{d}|=\sqrt{\frac{1}{25}+\frac{1}{25}+\frac{1}{100}}=\sqrt{\frac{9}{100}}=\frac{3}{10}$;

$\vec{d}_0=\frac{10}{3}\begin{pmatrix}\frac{1}{5}\\\frac{1}{5}\\\frac{1}{10}\end{pmatrix}=\begin{pmatrix}\frac{10}{15}\\\frac{10}{15}\\\frac{10}{30}\end{pmatrix}=\begin{pmatrix}\frac{2}{3}\\\frac{2}{3}\\\frac{1}{3}\end{pmatrix}$

$|\vec{e}|=\sqrt{\sqrt{2}^2+\sqrt{3}^2+\sqrt{5}^2}=\sqrt{10}$

$\vec{e}_0=\begin{pmatrix}\frac{\sqrt{2}}{\sqrt{10}}\\\frac{\sqrt{3}}{\sqrt{10}}\\\frac{\sqrt{5}}{\sqrt{10}}\end{pmatrix}=\begin{pmatrix}\sqrt{\frac{1}{5}}\\\sqrt{\frac{3}{10}}\\\sqrt{\frac{1}{2}}\end{pmatrix}$

$\frac{\sqrt{a}}{\sqrt{b}}=\sqrt{\frac{a}{b}}$

$$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$$

② $\vec{p} = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$, $\vec{q} = \begin{pmatrix} 2 \\ -1 \\ 3 \end{pmatrix}$

a.) $|\vec{p} + \vec{q}| = \left|\begin{pmatrix} 3 \\ -1 \\ 2 \end{pmatrix}\right| = \sqrt{9+1+4} = \sqrt{14}$

c.) $|\vec{p} - 2\vec{q}| = \left|\begin{pmatrix} -3 \\ 2 \\ -7 \end{pmatrix}\right| = \sqrt{9+4+49} = \sqrt{62}$