Nr. 7

$a = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$ $b = \begin{pmatrix} 1 \\ -1 \\ 0 \end{pmatrix}$ $c = \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix}$ $d = \begin{pmatrix} 2 \\ -2 \\ 1 \end{pmatrix}$

$P_a(d) = \frac{\langle d,a \rangle}{\langle a,a \rangle} a = \frac{1}{3} \cdot \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} = \begin{pmatrix} \frac{1}{3} \\ \frac{1}{3} \\ \frac{1}{3} \end{pmatrix}$

$P_b(d) = \frac{\langle d,b \rangle}{\langle b,b \rangle} b = \frac{4}{2} \begin{pmatrix} 1 \\ -1 \\ 0 \end{pmatrix} = \begin{pmatrix} 2 \\ -2 \\ 0 \end{pmatrix}$

$P_c(d) = \frac{\langle d,c \rangle}{\langle c,c \rangle} c = \frac{-2}{6} \begin{pmatrix} 1 \\ 1 \\ -2 \end{pmatrix} = \begin{pmatrix} -\frac{1}{3} \\ -\frac{1}{3} \\ \frac{2}{3} \end{pmatrix}$

entspricht $\vec{d} \begin{pmatrix} 2 \\ -2 \\ 1 \end{pmatrix}$

Nr. 8

$\sqrt{(-5)^2 + (-5)^2 + (20)^2} = 5 \cdot \sqrt{18} = 5 \cdot 3 \cdot \sqrt{2} = 15\sqrt{2}$

$G_\square = 100\,FE$

$F_\triangle = 472{,}31\,FE$

$V_\triangle = \frac{100 \cdot 20}{3} = \frac{2000}{3}\,VE$