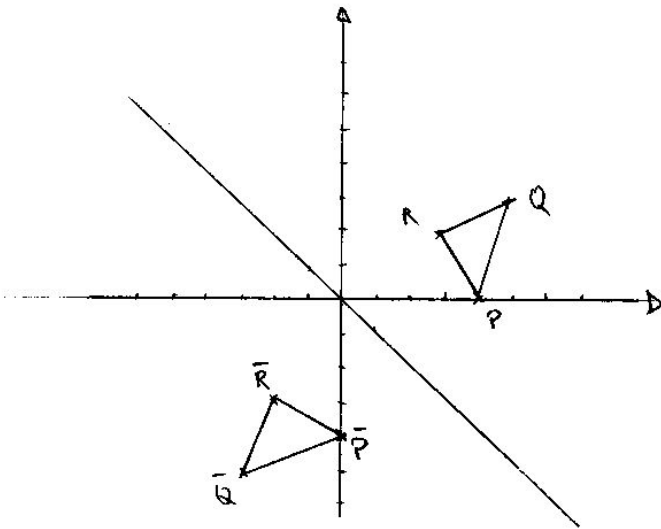


i) 621



ii)

$$\left. \begin{aligned} A \begin{pmatrix} 1 \\ 0 \end{pmatrix} &= - \begin{pmatrix} 0 \\ 1 \end{pmatrix} \\ A \begin{pmatrix} 0 \\ 1 \end{pmatrix} &= - \begin{pmatrix} 1 \\ 0 \end{pmatrix} \end{aligned} \right\} A = \begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$$

iii)

$\bar{\Delta}$ ist gegeben durch

$$\bar{R} = -\begin{pmatrix} 2 \\ 3 \end{pmatrix}, \quad \bar{Q} = \begin{pmatrix} -3 \\ -5 \end{pmatrix}, \quad \bar{P} = \begin{pmatrix} 0 \\ -4 \end{pmatrix}.$$

$$\overline{RQ} = \begin{pmatrix} -1 \\ -2 \end{pmatrix}, \quad \overline{QP} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}, \quad \overline{PR} = \begin{pmatrix} -2 \\ 1 \end{pmatrix}.$$

$$|\overline{RQ}| = \sqrt{5}, \quad |\overline{QP}| = \sqrt{10}, \quad |\overline{PR}| = \sqrt{5}.$$

$$\left. \begin{aligned} \angle(\overline{RQ}, \overline{QP}) &= \arccos\left(\frac{1}{\sqrt{2}}\right) = 45^\circ \\ \angle(\overline{QP}, \overline{PR}) &= \arccos(0) = 90^\circ \end{aligned} \right\} \angle(\overline{RQ}, \overline{PR}) = 45^\circ.$$

$$F(\bar{\Delta}) = \frac{1}{2} \cdot (\sqrt{5})^2 = \frac{5}{2}.$$

Δ ist gegeben durch

$$R = \begin{pmatrix} 3 \\ 2 \end{pmatrix}, Q = \begin{pmatrix} 5 \\ 3 \end{pmatrix}, P = \begin{pmatrix} 4 \\ 0 \end{pmatrix}.$$

$$\overline{RQ} = \begin{pmatrix} 2 \\ 1 \end{pmatrix}, \overline{QP} = \begin{pmatrix} -1 \\ -3 \end{pmatrix}, \overline{PR} = \begin{pmatrix} -1 \\ -2 \end{pmatrix}.$$

$$|\overline{RQ}| = \sqrt{5}, |\overline{QP}| = \sqrt{10}, |\overline{PR}| = \sqrt{5}.$$

$$\left. \begin{array}{l} \angle(\overline{RQ}, \overline{QP}) = 45^\circ \\ \angle(\overline{QP}, \overline{PR}) = 90^\circ \end{array} \right\} \angle(\overline{RQ}, \overline{PR}) = 45^\circ$$

$$F(\Delta) = \frac{1}{2} (\sqrt{5})^2 = \frac{5}{2}.$$

Ausdrücklich bleiben Seitenlängen, Winkel und Flächeninhalt
erhalten!

G 22/H 28

i) Sei $\dim V = k$, $\dim W = n$.

\Rightarrow Wähle Basis e_1, \dots, e_k in V und Basis f_1, \dots, f_n in W .