$$A = \begin{array}{|c|c|c|} \hline -1 & -2 & 2 \\ \hline 3 & 4 & -3 \\ \hline 2 & 2 & -1 \\ \hline \end{array} \implies A \text{ projection/Basis von Bild A/Kern A}$$

$$A = \begin{array}{|c|c|c|} \hline 0 & 1 & 0 \\ \hline 1 & 2 & 2 \\ \hline -2 & 0 & -1 \\ \hline 2 & 2 & 4 \\ \hline \end{array} \implies \text{ Ker A/Loesungen } A \begin{array}{|c|} x_1 \\ x_2 \\ x_3 \end{array} = \begin{array}{|c|} 3 \\ 5 \\ 2 \\ 4 \end{array}$$

$$U = \frac{x \in \mathbb{R}^n}{x_1 + 2x_2 + \cdots + nx_n = 0} \implies \dim U/\text{Komplement } U \times U' = \mathbb{R}^n$$

$$A \in \mathbb{K}^{m \times n}/B \in \mathbb{K}^{n \times p}: \quad \operatorname{Rang} AB \leqslant p - \dim \ker B$$

$$v^1 = \frac{1}{\begin{array}{c}1\\1\end{array}}: \quad v^2 = \frac{2}{\begin{array}{c}3\\0\end{array}}: \quad v^3 = \frac{0}{\begin{array}{c}-1\\1\end{array}} \text{ basis of } \mathbb{R}^3 / \text{ Standardbasis of } \mathbb{R}^2 \implies \text{ Matrix of}$$

$$\begin{array}{c} x_1 \\ x_2 \\ x_3 \end{array} \in < v^1 : v^2 : v^3 > = \mathbb{R}^3 \xrightarrow{T} \mathbb{R}^2 \ni \frac{x_1 + x_2}{x_2 + x_3}: \quad \begin{array}{c} x_1 \\ x_2 \\ x_3 \end{array} \in < v^1 : v^2 > \xrightarrow{S} \mathbb{R}^2 \ni \frac{3x_1 - x_2 + 4x_3}{x_1 - x_3}$$

$$\frac{A \in \mathbb{R}^{n \times n}}{A \text{ invertible } /A^2 = A/\overset{t}{A} = A/ \dim \ker A \geqslant 1} \subset \mathbb{R}^{n \times n} \text{ welches lin UR?}$$

$$V \xrightarrow[\text{lin}]{T} W = < w_1 \cdots w_n > : \quad T \text{ surj} \Leftrightarrow \bigwedge_j \bigvee_{v_j} w_j = T v_j$$

$$\mathbb{R} \xrightarrow{f_1 \cdots f_n} \mathbb{R}/t_1 \cdots t_n \in \mathbb{R}/ v_i = \frac{f_i(t_1)}{\begin{array}{c}\cdots\\f_i(t_n)\end{array}} \in \mathbb{R}^n: \quad v_1 \cdots v_n \in \mathbb{R}^n \text{ lin unabh} \implies f_1 \cdots f_n \in \mathbb{R}^{\mathbb{R}} \text{ lin unabh}$$