$$[r_1(A), \quad , r_m(A)] = [r_1(B), \dots$$

$$\forall x \qquad\qquad \dots r_m(B)] \Rightarrow x \in$$

$$\frac{1}{c} \; c \, r_j(A)$$

$$\ne 0$$

$$c\, r_i(A) + r_j(A)$$

$$- c\, r_i(A) + (c\, r_i(A) + r_j(A)) =$$

$$= r_j(A)$$

$h_n(A) = h_0(A)$

$A \leadsto B$ n. p. l.

<u>vz.</u>

množ. vl. každ. funkce B =

$h_0(A)$

$[\ldots n_i(A), \ldots] = [\ldots, n_i(B)]$

$\underline{h_n(A)} = h_n(B)$

$$h(A) = h(A^T)$$

$$h(A) = h_o(A) = h_r(A^T) = h(A^T)$$

g) $u_1, \dots, u_n$ LN

$$\dim \underbrace{[u_1, \dots, u_n]}_{} = n$$

$$\dim [s_1(A), \quad s_n(A)] = h_o(A) = n$$

$$\varphi(x) = Ax \qquad \varphi : \mathbb{K}^m \to \mathbb{K}^n$$

$$\psi(y) = By \qquad \psi : \mathbb{K}^n \to \mathbb{K}^m$$

$$\varphi \circ \psi : \mathbb{K}^n \to \mathbb{K}^n$$

$$(\varphi \circ \psi)(y) = A \cdot B\, y.$$

$$\operatorname{Im}(\varphi \circ \psi) \subseteq \underline{\operatorname{Im} \varphi}$$

$$\operatorname{Im} \psi \subseteq \mathbb{K}^m$$

$$h(AB) = h(\varphi \circ \psi) \leq h(\varphi) = h(A)$$

$$h(AB) \le h(A) \quad \|$$

$$h(AB) = h((AB)^T) =$$

$$= h(B^T \cdot A^T) \le h(B^T) =$$

$$= h(B)$$

$$AB_1 = I_n = B_1 A = B_2 A = AB_2$$

$$B_1 = I_n B_1 = B_2 A B_1 =$$

$$= B_2 \cdot I_n = B_2$$

$A = (\varphi)_{\alpha\beta}$, $\varphi \circ \psi = id_U$

$A^{-1} \; \exists \iff \varphi^{-1} \; \exists$

$\boxed{A A^{-1} = I_n = A^{-1} A}$

$\psi \quad (\psi)_{\beta,\alpha} = A^{-1}$

$(\varphi)_{\alpha\beta} \cdot (\psi)_{\beta\alpha} = (id_U)_{\alpha,\alpha}$

$\boxed{(\psi)_{\beta\alpha} \cdot (\varphi)_{\alpha\beta} = (id_V)_{\beta,\beta}}$

$\boxed{\psi \circ \varphi = id_V}$

$\exists A^{-1}$ $\quad A \cdot A^{-1} = I_n$

$h(I_n) = n$

$n = h(I_n) \leq \min\{h(A), h(A^{-1})\} \leq n$

$$\boxed{h(I_n) = h(A) = h(A^{-1}) = n}$$

$h(A) = n$ $\quad \varphi : K^n \to K^n$

$\varphi(x) = Ax$ $\quad$ prosté, na $\quad$ $\dim \operatorname{Ker}\varphi = 0$

$$n = \underbrace{h(A)}_{n} + \dim \operatorname{Ker} \varphi$$

$$(A^{-1})^{-1} = A$$

$$A^{T} \quad (A^{-1})^{T} =$$

$$= (A^{-1} \cdot A)^{T}$$

$$= (I_n)^{T}$$

$$= I_n$$

$$A \, A^{-1} = I_n$$

$$\| $$

$$(A^{T})^{-1}$$

$$A B \; \boxed{(B^{-1} A^{-1})} =$$

$$A \, (\cancel{B B^{-1}}) \, A^{-1} =$$

$$I_n$$

$$A A^{-1} = I_n$$

$$(A \mid I_n) \sim (B \mid E)$$

$$\boxed{B = EA}$$

① záměna řádků

$$i \leftrightarrow j$$

$$\begin{pmatrix} 1 & & 0 \\ & \ddots & \\ 0 & & 1 \end{pmatrix}$$

$$\begin{array}{c} \\ i \\ j \\ \\ \end{array} \begin{pmatrix} 1 & & & \\ & 0 & 1 & \\ & 1 & 0 & \\ & & & \ddots \; 1 \end{pmatrix}$$

$$\begin{pmatrix} 1 & & & \\ & \ddots & & \\ & & c & \\ & & & \ddots \; 1 \end{pmatrix}$$