1 jak se mela resit minula pisemka

$$\begin{bmatrix} 1 & 2 & 03 & 4 \\ 2 & p & 4 & 1 \\ 3 & 4 & 1 & 2 \\ 4 & 1 & 2 & p \end{bmatrix}$$

REF kam az to pujde

$$\begin{bmatrix} 1 & 2 & 03 & 4 \\ 0 & p+1 & 3 & 3 \\ 0 & 3 & 2 & 0 \\ 0 & 3 & 0 & p+4 \end{bmatrix}$$

vybereme si jen radky a sloupce co poterbujeme
protoze zbytek uz ma pivoty definovane

$$\begin{bmatrix} p+4 & 3 \\ 3 & p+4 \end{bmatrix}$$

Zjednodusime a vyzkousime vse v Z^5

$$\begin{bmatrix} 1 & 2p+3 \\ 0 & 2p+1-p(2p+3) \end{bmatrix}$$

2 jsou linearne nezavisle?

v $\mathbb{R}^4$:
$x_1 = (1,2,0,0)^T$
$x_2 = (2,1,1,3)^T$
$x_3 = (0,1,0,1)^T$
matice pro vypocet:

$$\begin{bmatrix} 1 & 2 & 0 \\ 2 & 1 & 1 \\ 0 & 1 & 0 \\ 0 & 3 & 1 \end{bmatrix} -REF-> \begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 1 \\ 0 & 0 & 0 \end{bmatrix}$$

tudiz ma dimenzi 3 a tudiz jsou ty vektory linearne nezavisle
jaky vektor jeste muzeme prdat aby byly stale linearne nezavisle?

$$\begin{bmatrix} 1 & 2 & 0 & a \\ 2 & 1 & 1 & b \\ 0 & 1 & 0 & c \\ 0 & 3 & 1 & d \end{bmatrix} \begin{bmatrix} 1 & 2 & 0 & a \\ 0 & 1 & 0 & c \\ 0 & 0 & 1 & b-2a+3c \\ 0 & 0 & 1 & d-3c \end{bmatrix} \begin{bmatrix} 1 & 2 & 0 & a \\ 0 & 1 & 0 & c \\ 0 & 0 & 1 & b-2a+3c \\ 0 & 0 & 0 & d-3c-(b-2a+3c) \end{bmatrix}$$

vysledek:

$$2a - b - 6c + d \neq 0$$

3 jak vypocist souradnice s jinou bazi

zadani: v $\mathbb{R}^4$:
$B = ((1,-3,7,2)^T, (3,2,1,-4)^T, (0,-1,4,-3)^T, (-2,4,-3,0)^T)$
$x_1 = (2,2,9,-5)^T$
$x_2 = (-7,2,9,-8)^T$
$x_3 = (-2,4,-3,0)^T$

dosazeni do matice:

$$\left[\begin{array}{cccc|ccc} 1 & 3 & 0 & -2 & 2 & -7 & -2 \\ -3 & 2 & -1 & 4 & 2 & 2 & 4 \\ 7 & 1 & 4 & -3 & 9 & 9 & -3 \\ 2 & -4 & -3 & 0 & -5 & -8 & 0 \end{array}\right] \; RREF \; \left[\begin{array}{cccc|ccc} 1 & 0 & 0 & 0 & 1 & 0 & 2 \\ 0 & 1 & 0 & 0 & 1 & -1 & -4 \\ 0 & 0 & 1 & 0 & 1 & 4 & 0 \\ 0 & 0 & 0 & 1 & 1 & 2 & -7 \end{array}\right]$$

tudiz nam vzniknou nove souradnice:
$[x_1]_B = (1,1,1,1)^T$
$[x_2]_B = (0,-1,4,2)^T$
$[x_3]_B = (2,-4,0,-7)^T$

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