

1. Homework (replacement for the 1st test)

from https://mat.nipax.cz/_media/m1_selected_problems.pdf

number of examples: 8, 51, 70, 73, 110, 112, 140, 143, 148, 175, 185, 236, 256, 258, 276, 278, 295, 300, 301, 309

solution:

sol.

8. $(-1; 0; 3; 4) = \vec{x}$

51. not LI; $\dim = 2$; E.g. $\{\vec{x}, \vec{y}\}$

70. not LI for $a \in \{-1, 2\}$... $\dim = 2$
LI ($\dim = 3$) otherwise

73. E.g. $\vec{a} = \vec{u} + \vec{v}$ (not unambiguous)

110. $\begin{pmatrix} 3 & 6 & 3 \\ 2 & 4 & 2 \\ 1 & 2 & 1 \end{pmatrix}$ 112. $\begin{pmatrix} 1 & 2 \\ 3 & 2 \\ 1 & 3 \end{pmatrix}$

140. $x = 4; y = 2$ 148. $\nexists A^{-1}$

143. $\frac{1}{5} \begin{pmatrix} -14 & 7 & 5 \\ -13 & 4 & 5 \\ 15 & -5 & -5 \end{pmatrix}$ 175. $\frac{1}{4} \begin{pmatrix} 2 & 1 \\ 0 & 1 \end{pmatrix}$

185. -58 236. $7: p(1; 1) \quad -2: q(4; 5)$

256. $1: p(-1; 3); \quad 4: q(0; 1)$

258. $\lambda_{1,2,3} = 1: p(-1; -1; 1)$ $\left. \begin{matrix} p, q \in \mathbb{R} - \{0\} \end{matrix} \right\}$

276. $1 \quad (\vec{x} = (2; 3; 5))$

278. $\boxed{a=1} \infty \text{ sol.}; \quad a \in \mathbb{R} - \{1; -2\} \quad 1 \text{ sol.}$

300. 1 for $l=1$ 295. no
 0 otherwise

301. 1 for $l=2$
 0 otherwise

309. only 1 sol. ($\vec{x} = \vec{0}$)