Úlohy ke cvičení

Úloha 1: Solve the following system of linear equations and verify the solution.

a)
$$\begin{array}{rcrcrcrcr} -x_1 & + & x_2 & + & 3x_3 & & & = & -2 \\ 2x_1 & - & x_2 & - & 6x_3 & + & x_4 & = & 2 \\ -x_1 & + & x_2 & + & 4x_3 & & & = & -2 \\ & & x_2 & + & 2x_3 & + & 2x_4 & = & 0 \end{array}$$

Úloha 2: Solve the following system of equations.

a)
$$\begin{array}{rrrrcr} 17a & +8b & +4c & +7d & = & 30 \\ -11a & & & +3d & = & -2 \\ 7a & +2b & +c & -2d & = & -1 \\ 13a & +6b & & -2d & = & 7 \end{array}$$

Úloha 3: Find at least one nontrivial solution for the system $\mathbf{Ax} = \mathbf{0}$ for the following matrix $\mathbf{A}$, if such solution exists.

a) $\mathbf{A} = \begin{pmatrix} 2 & -3 & 13 & 18 \\ 6 & -9 & 7 & 10 \\ 2 & -3 & -3 & -4 \end{pmatrix}$

Úloha 4: Verify, whether $\mathbf{x} = (4, 0, -3, 0, 2)^T + p(-2, 3, 2, 1, 0)^T + q(1, 2, -1, 0, 1)^T$ is a solution of the system

$$\begin{array}{rcrcrcrcrcr} x_1 & - & x_2 & + & 2x_3 & + & x_4 & + & 3x_5 & = & 4 \\ 2x_1 & - & 2x_2 & + & 5x_3 & & & + & 7x_5 & = & 7 \\ x_1 & - & x_2 & + & x_3 & + & 3x_4 & + & x_5 & = & 3 \\ x_1 & - & x_2 & & & + & 5x_4 & + & 3x_5 & = & 9 \end{array}$$