Algebra a diskrétna matematika
Príklady na precvičenie
1. týždeň

Gaussovou eliminačnou metódou riešte dané sústavy lineárnych rovníc.

1.
$$\begin{aligned} x + y - z &= 10 \\ 10x + 4y + z &= -12 \\ 3x + 2y + z &= -6 \end{aligned}$$

2.
$$\begin{aligned} x + 3y - 2z &= 16 \\ 7x - y + 3z &= 16 \\ 4x + 2y - z &= 16 \end{aligned}$$

3.
$$\begin{aligned} 6x - y + 2z &= 21 \\ 3x + 2y - 3z &= -3 \\ 5x + y - z &= 10 \end{aligned}$$

4.
$$\begin{aligned} 2x - 3y + 5z &= 14 \\ 3x + y - 2z &= 0 \\ 4x - 2y + 2z &= 10 \end{aligned}$$

5.
$$\begin{aligned} x - 4y + z &= 18 \\ 2x - 7y - 2z &= 4 \\ 4x - 13y - 8z &= -24 \end{aligned}$$

6.
$$\begin{aligned} x + 4y - z &= 0 \\ 3x + y - 2z &= 0 \\ 2x + 9y + 2z &= 0 \end{aligned}$$

7.
$$\begin{aligned} 8x + 3y + 10z &= 17 \\ 2x - y + 4z &= -4 \\ 5x - 2y - z &= -5 \end{aligned}$$

8.
$$\begin{aligned} 3x + 4y + 25z &= 3 \\ 5x + y + 10z &= 7 \\ 7x + 6y &= 5 \end{aligned}$$

9.
$$\begin{aligned} x_1 + x_2 + x_3 + x_4 &= 2 \\ x_1 + 2x_2 + 3x_3 + 4x_4 &= 7 \\ x_1 - x_2 + x_3 - x_4 &= 0 \\ -x_1 + 2x_2 - 3x_3 + 4x_4 &= 5 \end{aligned}$$

10.
$$\begin{aligned} 5x_1 - x_2 + 2x_3 + 10x_4 &= 0 \\ -x_1 + 2x_2 + 6x_3 - 5x_4 &= 9 \\ 9x_1 + 12x_2 + 5x_3 + 13x_4 &= 1 \\ -2x_1 - 5x_2 - 20x_3 + 5x_4 &= 7 \end{aligned}$$

11.
$$\begin{aligned} 7x_1 - x_2 - 10x_3 - 2x_4 &= 2 \\ x_1 + x_2 - 6x_3 + x_4 &= 8 \\ 3x_1 - 5x_2 + x_3 - x_4 &= 0 \\ 4x_1 - x_2 + 2x_3 - x_4 &= 2 \end{aligned}$$

12.
$$\begin{aligned} x_1 + 4x_2 - 4x_3 + x_4 &= 2 \\ x_1 + 3x_2 + x_3 - x_4 &= 13 \\ 2x_1 - x_2 + x_3 + 3x_4 &= 5 \\ 4x_1 + x_2 + 3x_3 + 6x_4 &= 12 \end{aligned}$$

13.
$$\begin{aligned} 7x_1 + 3x_2 + 6x_3 - x_4 &= 0 \\ 3x_1 + 2x_2 + x_3 + x_4 &= 0 \\ -x_1 + x_2 - x_3 + 2x_4 &= 0 \\ 3x_1 + 2x_2 - 2x_3 + 2x_4 &= 0 \end{aligned}$$

14.
$$\begin{aligned} x_1 + 2x_2 + 3x_3 + 4x_4 + 5x_5 &= -2 \\ 3x_2 + 2x_3 + x_4 + 6x_5 &= -11 \\ 3x_2 + 2x_3 + 4x_4 - 4x_5 &= -15 \\ 2x_1 + 4x_2 + 6x_3 - x_4 + 25x_5 &= -7 \end{aligned}$$

15.
$$\begin{aligned} 2x_1 + x_2 - x_3 - x_4 &= 3 \\ 3x_1 - 2x_2 + 2x_3 - 5x_4 &= 1 \\ -x_1 - x_2 + x_3 &= -2 \\ 5x_1 - x_2 + x_3 - 6x_4 &= 4 \end{aligned}$$

16.
$$\begin{aligned} 2x_1 - x_2 + 3x_3 - 3x_4 &= -7 \\ 4x_1 + x_2 - 7x_3 + x_4 &= 5 \\ -x_1 + 2x_2 - 2x_3 - x_4 &= -11 \\ 5x_1 - 3x_2 - x_3 + 2x_4 &= 22 \end{aligned}$$

17.
$$\begin{aligned} x + 2y + z + u - v &= 3 \\ x - y - z + 4u + v &= -2 \\ 2x + y + 2z + 3u - v &= 2 \\ -x + 2y + 4z - v &= 3 \\ 3x - 2y - z - u - v &= -1 \end{aligned}$$

18.
$$\begin{aligned} 5x_1 + x_2 - x_3 + x_4 + x_5 &= -6 \\ 3x_1 + 2x_2 + x_3 - x_4 &= 10 \\ x_1 - x_2 - x_3 - x_4 + x_5 &= 8 \\ -2x_1 + x_2 + 2x_3 + x_5 &= 6 \\ 3x_2 + x_3 + 2x_4 + 2x_5 &= -13 \end{aligned}$$

19.
$$\begin{aligned} x + y + z + 2u - v &= 2 \\ 4x + 2y - 6z + u - v &= 4 \\ 2x - y - 7z + u - v &= -8 \\ x + 4y + 10z + 5u - 2v &= -2 \\ -4y - 8z + u - v &= 12 \end{aligned}$$

20.
$$\begin{aligned} x_1 + x_2 + x_3 + 2x_4 - x_5 &= 2 \\ -2x_1 + x_2 + 7x_3 - x_4 + x_5 &= -8 \\ x_1 + 4x_2 + 10x_3 + 5x_4 - 2x_5 &= -2 \\ 4x_1 + 2x_2 - 6x_3 + x_4 - x_5 &= 4 \\ x_1 + 2x_3 + 6x_4 - 3x_5 &= 10 \end{aligned}$$

21.
$$\begin{aligned} x_1 - x_2 + x_3 - x_4 - x_5 &= 2 \\ x_2 - x_3 - x_4 &= 0 \\ 4x_1 - 5x_2 + 3x_3 - 3x_4 - 4x_5 &= 8 \\ 2x_1 - 4x_2 - 2x_5 &= 4 \\ 7x_1 - 10x_2 + 4x_3 - 4x_4 - 7x_5 &= 14 \end{aligned}$$

22.
$$\begin{aligned}
x_1 + x_2 - x_5 - x_6 &= 2\\
2x_1 + x_2 - x_3 - 2x_5 - x_6 &= 4\\
-x_1 + x_2 + 2x_4 - x_5 - 3x_6 &= 8\\
3x_1 - x_2 - 5x_3 + x_4 - 4x_5 &= 11\\
5x_1 + 2x_2 - 2x_3 - x_4 - 4x_5 - 2x_6 &= 5\\
x_1 - x_2 - 3x_3 + x_4 - 2x_5 &= 7
\end{aligned}$$

23.
$$\begin{aligned}
x_1 + x_2 - x_3 + x_4 + x_5 + x_6 &= 10\\
x_2 + x_3 - x_5 &= 20\\
x_1 - x_2 + x_6 &= 5\\
2x_1 + x_4 + x_5 + x_6 &= 0\\
5x_1 + 3x_2 - 4x_3 + x_6 &= 45
\end{aligned}$$

24.
$$\begin{aligned}
x_1 + x_7 &= 0\\
x_2 + x_3 + x_7 &= 1\\
x_1 + x_2 + x_5 + x_7 &= 2\\
x_1 + x_2 + x_3 &= 3\\
x_1 + x_2 + x_5 + x_6 &= 4\\
x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 &= 5\\
x_1 + x_3 + x_4 + x_5 + x_6 - x_7 &= 6
\end{aligned}$$