

$$\begin{array}{l}
 1. \quad \begin{array}{r}
 x_1 + x_2 + x_3 + x_4 = 2 \\
 2x_1 + 3x_2 + 2x_3 + 4x_4 = 8 \\
 2x_1 + 2x_2 + x_3 - 3x_4 = 1 \\
 x_1 + x_2 + x_3 - x_4 = 0
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 2. \quad \begin{array}{r}
 x_1 + 2x_2 + x_3 + 2x_4 = 3 \\
 2x_1 + x_2 + x_3 + x_4 = 4 \\
 -x_1 + 2x_2 + x_3 + x_4 = 0 \\
 x_2 + x_3 + 2x_4 = 3
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 3. \quad \begin{array}{r}
 x_1 + x_2 + x_3 + x_4 = 4 \\
 x_2 + x_3 + x_4 = 1 \\
 x_1 + 2x_2 + 3x_3 = 10 \\
 x_2 + 2x_3 + 3x_4 = -2
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 4. \quad \begin{array}{r}
 2x_1 + x_2 + 2x_3 + 3x_5 = 0 \\
 x_1 + 2x_2 + x_3 + 3x_4 + x_5 = 2 \\
 3x_1 + x_2 - x_3 + 2x_4 = -1 \\
 x_1 - 3x_3 - 2x_5 = -4 \\
 2x_1 - 3x_2 - 2x_4 - 2x_5 = 3
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 5. \quad \begin{array}{r}
 2x_1 + x_2 - x_3 + x_4 + x_5 = 3 \\
 x_2 + x_3 - x_4 = 5 \\
 x_1 - x_2 + x_4 = 0 \\
 x_1 + x_2 - x_3 - x_4 = 1 \\
 x_4 + 2x_5 = 3
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 6. \quad \begin{array}{r}
 x_1 - x_2 + 2x_3 + 3x_4 = -1 \\
 2x_1 - 2x_2 + x_4 - x_5 = -3 \\
 x_2 - x_3 + 2x_4 + x_5 = -6 \\
 x_1 - x_3 + x_4 - 2x_5 = -2 \\
 2x_1 - 3x_2 - 2x_3 + 2x_5 = -12
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 7. \quad \begin{array}{r}
 x_1 - 3x_2 + 2x_3 - x_4 + 2x_5 = 3 \\
 2x_1 + x_3 + x_4 + 4x_5 = 15 \\
 x_2 - 3x_3 + 2x_4 + x_5 = 5 \\
 x_3 + x_5 = 9 \\
 x_1 - x_2 - x_3 + x_4 + x_5 = 2
 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \mathbf{x}_1 + \mathbf{x}_2 + \mathbf{x}_3 + \mathbf{x}_4 - 2\mathbf{x}_5 = 0 \\
 \mathbf{x}_1 - \mathbf{x}_2 - \mathbf{x}_3 + \mathbf{x}_4 - \mathbf{x}_5 = 1 \\
 8. \quad \mathbf{x}_1 - \mathbf{x}_2 + 2\mathbf{x}_3 + 2\mathbf{x}_4 - 2\mathbf{x}_5 = -1 \\
 2\mathbf{x}_1 + \mathbf{x}_2 - \mathbf{x}_3 + 2\mathbf{x}_4 - \mathbf{x}_5 = 0 \\
 3\mathbf{x}_1 - 2\mathbf{x}_2 - \mathbf{x}_3 - \mathbf{x}_4 + \mathbf{x}_5 = 0
 \end{array}$$

$$\begin{array}{r}
 \mathbf{x}_1 - 2\mathbf{x}_2 - \mathbf{x}_3 - 3\mathbf{x}_4 - 2\mathbf{x}_5 = -42 \\
 \phantom{\mathbf{x}_1 - 2\mathbf{x}_2 - \mathbf{x}_3 - } 3\mathbf{x}_4 + 2\mathbf{x}_5 = 34 \\
 9. \quad 8\mathbf{x}_1 + 7\mathbf{x}_2 + 6\mathbf{x}_3 + 5\mathbf{x}_4 + 4\mathbf{x}_5 = 100 \\
 \phantom{8\mathbf{x}_1 + 7\mathbf{x}_2 + 6\mathbf{x}_3 + } 2\mathbf{x}_4 + \mathbf{x}_5 = 20 \\
 \phantom{8\mathbf{x}_1 + 7\mathbf{x}_2 + 6\mathbf{x}_3 + 2\mathbf{x}_4 + \mathbf{x}_5 = } \mathbf{x}_2 + 3\mathbf{x}_3 + \mathbf{x}_4 + \mathbf{x}_5 = 28
 \end{array}$$

$$\begin{array}{r}
 3\mathbf{x}_1 - 2\mathbf{x}_2 + 5\mathbf{x}_3 - 6\mathbf{x}_4 = 0 \\
 7\mathbf{x}_1 + \mathbf{x}_2 - 3\mathbf{x}_3 - 4\mathbf{x}_4 = 1 \\
 10. \quad 6\mathbf{x}_1 + 5\mathbf{x}_2 - 13\mathbf{x}_3 + 3\mathbf{x}_4 = 1 \\
 2\mathbf{x}_1 - 13\mathbf{x}_2 + 40\mathbf{x}_3 - 16\mathbf{x}_4 = 13
 \end{array}$$

$$\begin{array}{r}
 2\mathbf{x}_1 + \mathbf{x}_2 - \mathbf{x}_3 + \mathbf{x}_4 = 0 \\
 \mathbf{x}_1 - \mathbf{x}_2 + \mathbf{x}_3 - \mathbf{x}_4 = 3 \\
 11. \quad \mathbf{x}_1 + 2\mathbf{x}_2 - 2\mathbf{x}_3 + 2\mathbf{x}_4 = 1 \\
 2\mathbf{x}_1 + \mathbf{x}_2 \phantom{- 2\mathbf{x}_3 + 2\mathbf{x}_4} = 3
 \end{array}$$

$$\begin{array}{r}
 \mathbf{x}_1 - 5\mathbf{x}_2 + \mathbf{x}_3 = 5 \\
 2\mathbf{x}_1 - \mathbf{x}_2 + 3\mathbf{x}_3 = 2 \\
 12. \quad \mathbf{x}_1 + \mathbf{x}_2 - \mathbf{x}_3 = 0 \\
 2\mathbf{x}_1 + 2\mathbf{x}_2 + 3\mathbf{x}_3 = 3
 \end{array}$$

$$\begin{array}{r}
 \mathbf{x}_1 - 2\mathbf{x}_2 + 2\mathbf{x}_3 - \mathbf{x}_4 = 16 \\
 \mathbf{x}_1 + \mathbf{x}_2 + \mathbf{x}_3 + \mathbf{x}_4 = 4 \\
 13. \quad \mathbf{x}_1 - \mathbf{x}_2 - 2\mathbf{x}_3 + \mathbf{x}_4 = -4 \\
 \mathbf{x}_1 - 5\mathbf{x}_2 + 3\mathbf{x}_3 - 3\mathbf{x}_4 = 28 \\
 \mathbf{x}_1 + 3\mathbf{x}_2 + 4\mathbf{x}_3 + \mathbf{x}_4 = 14
 \end{array}$$

$$\begin{array}{r}
 \mathbf{x}_1 - \mathbf{x}_2 + 2\mathbf{x}_3 - 3\mathbf{x}_4 = -1 \\
 14. \quad 3\mathbf{x}_1 + 2\mathbf{x}_2 + \mathbf{x}_3 - \mathbf{x}_4 = -14 \\
 \mathbf{x}_1 + 4\mathbf{x}_2 - 3\mathbf{x}_3 + 5\mathbf{x}_4 = 0
 \end{array}$$

$$\begin{array}{r}
 \mathbf{x}_1 + \mathbf{x}_2 - 3\mathbf{x}_3 = -1 \\
 2\mathbf{x}_1 + \mathbf{x}_2 - 2\mathbf{x}_3 = 1 \\
 15. \quad \mathbf{x}_1 + \mathbf{x}_2 + \mathbf{x}_3 = 3 \\
 \mathbf{x}_1 + 2\mathbf{x}_2 - 3\mathbf{x}_3 = 1
 \end{array}$$

16. 
$$\begin{aligned} 2x_1 + x_2 - x_3 + x_4 &= 1 \\ 3x_1 - 2x_2 + 2x_3 - 3x_4 &= 2 \\ 5x_1 + x_2 - x_3 + 2x_4 &= -1 \\ 2x_1 - x_2 + x_3 - 3x_4 &= 4 \end{aligned}$$
17. 
$$\begin{aligned} 3x_1 + x_2 - 2x_3 + x_4 - x_5 &= 1 \\ 2x_1 - x_2 + 7x_3 - 3x_4 + 5x_5 &= 2 \\ x_1 + 3x_2 - 2x_3 + 5x_4 - 7x_5 &= 3 \\ 3x_1 - 2x_2 + 7x_3 - 5x_4 + 8x_5 &= 3 \end{aligned}$$
18. 
$$\begin{aligned} x_1 + 2x_2 - 3x_3 + 2x_5 &= 1 \\ x_1 - x_2 - 3x_3 + x_4 - 3x_5 &= 2 \\ 2x_1 - 3x_2 + 4x_3 - 5x_4 + 2x_5 &= 7 \\ 9x_1 - 9x_2 + 6x_3 - 16x_4 + 2x_5 &= 25 \end{aligned}$$
19. 
$$\begin{aligned} 5x_1 + 12x_2 + 9x_3 + 25x_4 &= 15 \\ 15x_1 + 34x_2 + 25x_3 + 64x_4 &= 40 \\ 20x_1 + 46x_2 + 34x_3 + 89x_4 &= 70 \\ 10x_1 + 23x_2 + 17x_3 + 44x_4 &= 25 \end{aligned}$$
20. 
$$\begin{aligned} x_1 - 2x_2 + x_3 - 3x_4 &= -3 \\ x_1 + x_2 - 2x_3 + 2x_4 &= 5 \\ 3x_1 - 3x_3 + x_4 &= 7 \\ 2x_1 - x_2 - x_3 - x_4 &= 2 \end{aligned}$$
21. 
$$\begin{aligned} 2x_1 - 3x_2 - 2x_3 + x_4 &= 3 \\ x_1 - x_2 - x_3 - x_4 &= 2 \\ x_1 - 2x_2 - x_3 + 2x_4 &= 1 \\ 2x_1 + 2x_3 + x_4 &= 1 \end{aligned}$$
22. 
$$\begin{aligned} x_1 - x_2 + 5x_3 &= 1 \\ x_1 - 2x_2 + 4x_3 &= -1 \\ 2x_1 - 3x_2 + 9x_3 &= 0 \\ 2x_1 - 4x_2 + 8x_3 &= -2 \end{aligned}$$
23. 
$$\begin{aligned} x_1 + x_2 + x_3 + x_4 &= -3 \\ x_1 - x_2 - x_4 &= -4 \\ x_2 - x_3 + x_4 &= 5 \end{aligned}$$
24. 
$$\begin{aligned} x_1 + x_2 - 2x_3 - x_4 &= -1 \\ x_1 + 2x_2 - 3x_3 + 2x_4 &= -4 \\ 2x_1 + x_2 + x_3 - 2x_4 &= 2 \end{aligned}$$

$$\begin{array}{l}
 25. \quad x_1 - 2x_2 + x_3 - x_4 = -6 \\
 5x_1 + x_2 + 2x_3 + x_4 = 5 \\
 7x_1 - 3x_2 + 4x_3 - x_4 = -7
 \end{array}$$

$$\begin{array}{l}
 26. \quad x_1 - x_2 - 2x_3 + 4x_4 = 3 \\
 2x_1 - x_2 + 4x_3 - x_4 = -1 \\
 4x_1 - 3x_2 + 4x_3 - x_4 = -1 \\
 4x_1 - 3x_2 + 7x_4 = 5 \\
 3x_1 - 2x_2 + 2x_3 + 3x_4 = 2
 \end{array}$$

$$\begin{array}{l}
 27. \quad x_1 - x_2 - 3x_4 = -1 \\
 7x_1 - 2x_2 - 2x_3 - 10x_4 = -2 \\
 7x_1 - x_2 + x_3 - 9x_4 = -4 \\
 2x_1 - 2x_3 - 4x_4 = -6 \\
 6x_1 - x_2 + 2x_3 - 7x_4 = -1
 \end{array}$$

$$\begin{array}{l}
 28. \quad x_1 + x_2 + x_3 + x_4 = 1 \\
 2x_1 + 2x_2 + 2x_3 = 0 \\
 x_1 + x_2 + 5x_3 - x_4 + 6x_5 = 1 \\
 x_1 + x_2 - 3x_3 + x_4 - 6x_5 = -1
 \end{array}$$

$$\begin{array}{l}
 29. \quad 6x_1 - 9x_2 + 7x_3 + 10x_4 = 3 \\
 2x_1 - 3x_2 - 3x_3 - 4x_4 = 1 \\
 2x_1 - 3x_2 + 13x_3 + 18x_4 = 1
 \end{array}$$

$$\begin{array}{l}
 30. \quad 3x_1 + 4x_2 + 2x_3 = 2 \\
 x_1 - 2x_2 + 3x_3 = 2 \\
 2x_1 + 6x_2 - x_3 = 0
 \end{array}$$

$$\begin{array}{l}
 31. \quad 2x_1 + 3x_2 - 4x_3 = -14 \\
 2x_1 - 3x_2 + x_3 = 13 \\
 2x_1 + 9x_2 - 9x_3 = 20
 \end{array}$$

$$\begin{array}{l}
 32. \quad x_1 - x_2 + x_3 = 2 \\
 2x_1 - 3x_2 + 4x_3 = 4 \\
 x_1 - x_3 = 2
 \end{array}$$

$$\begin{array}{l}
 33. \quad x_1 - 2x_2 + 5x_3 = 9 \\
 3x_1 + x_2 - 3x_3 = -12 \\
 5x_1 - 2x_2 + 3x_3 = -1 \\
 x_1 - x_2 + x_3 = 2
 \end{array}$$

$$\begin{aligned}
 2x_1 - 3x_2 + 6x_3 - x_4 &= 1 \\
 x_1 + 2x_2 - x_3 &= 0 \\
 34. \quad x_1 + 3x_2 - x_3 - x_4 &= -2 \\
 9x_1 - x_2 + 15x_3 - 5x_4 &= 1
 \end{aligned}$$

$$\begin{aligned}
 2x_1 - 3x_2 + x_3 &= 0 \\
 35. \quad x_1 + 2x_2 - x_3 &= 3 \\
 2x_1 + x_2 + x_3 &= 12
 \end{aligned}$$

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

$$\begin{aligned}
 x_1 + 2x_2 - x_3 - 2x_4 &= -2 \\
 2x_1 + x_2 + x_3 + x_4 &= 8 \\
 37. \quad x_1 - x_2 - x_3 + x_4 &= 1 \\
 x_1 + 2x_2 + 2x_3 - x_4 &= 4
 \end{aligned}$$

$$\begin{aligned}
 3x_1 - x_2 + 2x_3 - x_4 &= 0 \\
 x_1 - 10x_2 + x_3 + x_4 &= 1 \\
 38. \quad 2x_1 + 4x_2 + 4x_3 + 2x_4 &= 3 \\
 -x_1 - 4x_2 + 4x_3 + 5x_4 &= 5
 \end{aligned}$$

$$\begin{aligned}
 4x_1 + 3x_2 - x_3 + x_4 + x_5 &= 15 \\
 x_1 - x_2 + x_3 - x_4 + x_5 &= 2 \\
 39. \quad 3x_1 - 2x_2 + x_3 - x_4 - 2x_5 &= 5 \\
 2x_1 + 3x_3 &= 0 \\
 x_2 + x_4 &= 0
 \end{aligned}$$

$$\begin{aligned}
 x_1 - 2x_2 + 2x_3 &= -9 \\
 40. \quad 3x_1 + 5x_2 + 4x_3 &= 10 \\
 5x_1 + 12x_2 + 6x_3 &= 29
 \end{aligned}$$

$$\begin{aligned}
 x_1 + 2x_2 - x_3 &= 2 \\
 3x_1 - x_2 + 2x_3 &= 7 \\
 41. \quad x_1 - x_3 &= -2 \\
 2x_1 + x_2 + x_3 &= 7
 \end{aligned}$$

$$\begin{aligned}
 2x_1 - x_2 + x_3 &= 4 \\
 x_1 + x_2 - x_3 &= -1 \\
 42. \quad 3x_1 - 7x_2 - 2x_3 &= -1 \\
 -2x_1 + 5x_2 + x_3 &= 1
 \end{aligned}$$

43. 
$$\begin{aligned} 7x_1 + 14x_2 - 21x_3 &= 7 \\ x_1 + 2x_2 - 3x_3 &= 1 \\ 5x_1 + 10x_2 + 15x_3 &= 5 \\ 3x_1 + 6x_2 - 9x_3 &= 3 \end{aligned}$$
44. 
$$\begin{aligned} 4x_1 + x_2 - x_3 - x_4 &= 3 \\ 2x_1 - 11x_2 + 5x_3 + 4x_4 &= 2 \\ 2x_1 + 12x_2 - 6x_3 - 10x_4 &= 1 \end{aligned}$$
45. 
$$\begin{aligned} 5x_1 + 3x_2 + 3x_3 + x_4 &= 11 \\ x_1 - x_2 + x_3 &= -2 \\ 3x_1 + 3x_2 + 2x_3 + x_4 &= 10 \\ x_1 - 3x_2 + 2x_3 &= -7 \\ 4x_1 + x_2 + 3x_3 + x_4 &= 8 \end{aligned}$$
46. 
$$\begin{aligned} x_1 + 8x_2 + 2x_3 + x_4 &= -3 \\ 3x_1 + 10x_2 + 2x_3 - x_4 &= -2 \\ 2x_1 &= 1 \\ 4x_1 + 3x_2 + x_3 + x_4 &= 5 \\ -2x_1 + 2x_2 &= -6 \end{aligned}$$
47. 
$$\begin{aligned} 3x_1 + x_2 - x_3 + 2x_4 &= 0 \\ x_1 + 2x_2 + x_3 - x_4 &= 0 \\ 2x_1 - x_2 + 2x_3 + x_4 &= 0 \\ x_1 + 3x_2 + x_3 + 3x_4 &= 0 \end{aligned}$$
48. 
$$\begin{aligned} 3x_1 + 2x_2 - x_3 + x_4 &= 0 \\ 2x_1 - x_2 + 4x_3 - 3x_4 &= 0 \\ x_1 + x_2 - x_3 &= 0 \end{aligned}$$
49. 
$$\begin{aligned} 2x_1 + 2x_2 - 2x_3 - 3x_4 &= 0 \\ x_1 - x_2 &+ x_4 = 0 \\ x_1 + 2x_2 + x_3 + x_4 &= 0 \end{aligned}$$
50. 
$$\begin{aligned} 3x_1 + x_2 + x_3 - x_4 &= 0 \\ 7x_1 + x_2 - x_3 + x_4 &= 0 \\ x_1 - x_2 - 3x_3 + 3x_4 &= 0 \end{aligned}$$
51. 
$$\begin{aligned} x_1 - 3x_2 + x_3 + 4x_4 &= 0 \\ x_1 + x_2 + 4x_3 - 2x_4 &= 0 \\ x_1 - x_2 + x_3 - 2x_4 &= 0 \end{aligned}$$

$$\begin{aligned}
 4x_1 + 2x_2 + x_3 - 2x_4 + x_5 &= 0 \\
 3x_1 + 4x_2 + x_3 + x_4 - 2x_5 &= 0 \\
 2x_1 - 2x_2 + 3x_3 - 2x_4 - 2x_5 &= 0 \\
 x_1 + 3x_2 + 4x_3 - 2x_4 &= 0
 \end{aligned}$$

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

$$\begin{aligned}
 4x_1 - 2x_2 + x_3 &= 0 \\
 x_1 + x_2 - x_3 &= 0 \\
 x_1 - 2x_2 + x_3 &= 0 \\
 2x_1 - x_2 + x_3 &= 0
 \end{aligned}$$

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

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

$$\begin{aligned}
 3x_1 + 4x_2 - 5x_3 + 7x_4 &= 0 \\
 2x_1 - 3x_2 + 3x_3 - 2x_4 &= 0 \\
 4x_1 + 11x_2 - 13x_3 + 16x_4 &= 0 \\
 7x_1 - 2x_2 + x_3 + 3x_4 &= 0
 \end{aligned}$$

$$\begin{aligned}
 x_1 + x_2 - 3x_4 - x_5 &= 0 \\
 x_1 - x_2 + 2x_3 - x_4 &= 0 \\
 4x_1 - 2x_2 + 6x_3 + 3x_4 - 4x_5 &= 0 \\
 2x_1 + 4x_2 - 2x_3 + 4x_4 - 7x_5 &= 0
 \end{aligned}$$

$$\begin{aligned}
 x_1 - 2x_2 + x_3 - x_4 + x_5 &= 0 \\
 2x_1 + x_2 - x_3 + 2x_4 - 3x_5 &= 0 \\
 3x_1 - 2x_2 - x_3 + x_4 - 2x_5 &= 0 \\
 2x_1 - 5x_2 + x_3 - 2x_4 + 2x_5 &= 0
 \end{aligned}$$

$$\begin{aligned}
 x_1 - 2x_2 + x_3 + x_4 - x_5 &= 0 \\
 2x_1 + x_2 - x_3 - x_4 + x_5 &= 0 \\
 x_1 + 7x_2 - 5x_3 - 5x_4 + 5x_5 &= 0 \\
 3x_1 - x_2 - 2x_3 + x_4 - x_5 &= 0
 \end{aligned}$$

61. Pro které hodnoty parametru  $a$  má soustava
- $$\begin{aligned} a \cdot x + y + z &= 1 \\ x + a \cdot y - z &= 1 \\ x + y + a \cdot z &= 1 \end{aligned}$$
- právě jedno řešení?
- 62.
- $$\begin{aligned} x_1 + 2x_2 + 3x_3 + 4x_4 + 5x_5 &= 1 \\ -2x_1 + 3x_2 + 4x_3 + 5x_4 + 6x_5 &= 2 \\ -3x_1 + 4x_2 + 5x_3 + 6x_4 + 7x_5 &= 3 \\ -4x_1 + 5x_2 + 6x_3 + 7x_4 + 8x_5 &= 4 \end{aligned}$$
- 63.
- $$\begin{aligned} x_1 - 3x_2 + x_3 + 4x_4 &= 0 \\ x_1 + x_2 + 4x_3 - 2x_4 &= 0 \\ x_1 - x_2 + x_3 - 2x_4 &= 0 \end{aligned}$$
64. Vytvořte si potřebné vektory a matice a zapište pomocí nich soustavu lineárních rovnic (soustavu nijak neupravujte):
- $$\begin{aligned} x_1 &= -x_1 + 3x_2 + 2x_3 - x_4 + 3 \\ x_2 &= x_1 - x_2 - x_3 + 2x_4 - 1 \\ x_3 &= -2x_1 - x_2 - x_3 - x_4 + 1 \\ x_4 &= x_1 - x_2 - x_3 - 2 \end{aligned}$$
- 65.
- $$\begin{aligned} 2x_1 - 5x_2 + x_3 &= -2 \\ 4x_1 - 8x_2 - 2x_3 &= 18 \\ 2x_1 - 3x_2 - 3x_3 &= 20 \\ x_1 - 4x_2 - x_3 &= 5 \end{aligned}$$
- 66.
- $$\begin{aligned} 4x_1 + x_2 + x_3 - x_4 &= 0 \\ x_1 + 2x_2 - 3x_3 + 2x_4 &= 0 \\ 2x_1 - 5x_2 + 7x_3 - 5x_4 &= 0 \\ 7x_1 - 4x_2 + 5x_3 - 4x_4 &= 0 \end{aligned}$$
- 67.
- $$\begin{aligned} 3x_1 + 2x_2 - x_3 + x_4 &= 0 \\ x_1 + x_2 - x_3 + 5x_4 &= 0 \\ 2x_1 + x_2 + 3x_3 - x_4 &= 0 \end{aligned}$$
- 68.
- $$\begin{aligned} x_1 + 2x_2 + 8x_3 &= 9 \\ 2x_1 + x_2 + 7x_3 &= 6 \\ 3x_1 + x_2 + 9x_3 &= 7 \\ 2x_1 - x_2 + x_3 &= -2 \end{aligned}$$
- 69.
- $$\begin{aligned} 4x_1 - x_2 + 2x_3 &= 0 \\ x_1 + x_2 + 2x_3 &= 0 \\ 5x_1 - x_2 - 3x_3 &= 0 \end{aligned}$$
70. Vyřešte soustavu rovnic
- $$\begin{aligned} x - 2y + z &= 1 \\ x - y + 3z &= 0 \\ x - 4y - 3z &= k \end{aligned}$$
- a proveďte diskusi vzhledem k parametru  $k$ .



71. Určete  $k$  tak, aby soustava rovnic

$$\begin{array}{rccccrc} & 2x_1 & -x_2 & +x_3 & +x_4 & = & 1 \\ & x_1 & +2x_2 & -x_3 & +4x_4 & = & 2 \\ & x_1 & +7x_2 & -4x_3 & +11x_4 & = & k \end{array}$$

měla řešení.

72.

$$\begin{array}{rccccrc} & x_1 & -2x_2 & -x_3 & +x_4 & = & 9 \\ & x_1 & -3x_2 & +5x_3 & -6x_4 & = & 7 \\ & x_1 & -x_2 & +2x_3 & -x_4 & = & 2 \\ & -x_1 & +x_2 & +x_3 & -2x_4 & = & -5 \end{array}$$

73.

$$\begin{array}{rccccrc} & x_1 & +x_2 & +2x_3 & +2x_4 & = & 0 \\ & x_1 & -x_2 & -3x_3 & +3x_4 & = & 5 \\ & 2x_1 & -x_2 & -2x_3 & +x_4 & = & -3 \\ & 4x_1 & -x_2 & -3x_3 & +6x_4 & = & 2 \end{array}$$

74.

$$\begin{array}{rccccrc} & 2x_1 & -x_2 & -x_3 & +x_4 & = & 0 \\ & 3x_1 & +2x_2 & +2x_3 & -x_4 & = & 0 \\ & x_1 & +3x_2 & +3x_3 & -2x_4 & = & 0 \end{array}$$

75.

$$\begin{array}{rccccrc} & x & +2y & -z & +u & = & 9 \\ & x & -y & +2z & -u & = & 2 \\ & -x & +y & +z & -2u & = & -5 \\ & 2x & -y & -z & +u & = & 2 \end{array}$$

1.	$(1, 2, -2, 1)$	23.	$(-2, 2 - t, -3, t)$
2.	$(1, -1, 2, 1)$	24.	$(9/4 + 13t, -11/4 - 15t, 1/4 - 3t, 4t)$
3.	$(3, 2, 1, -2)$	25.	$(r, 1 + 6r + 3s, s, 4 - 11r - 5s)$
4.	$(0, -1, 2, 1, -1)$	26.	$(5 - 7t, 5 - 7t, -3/2 + 2t, t)$
5.	$(2, 1, 3, -1, 2)$	27.	$(2, -9/2, 0, 5/2)$
6.	$(1, 2, 3, -2, 1)$	28.	$(3a, 3b + 1, 1 - 3a - 3b, 1, 2a + 2b + 1)$
7.	$(1, 2, -1, -2, 4)$	29.	$(a, b, 22a - 33b - 11, -16a + 24b + 8)$
8.	$(2, 3, 4, 1, 5)$	30.	$(6/5 - 16t, -2/5 + 7t, 10t)$
9.	$(0, 2, 4, 6, 8)$	31.	nemá řešení
10.	$(1, 1, 1, 1)$	32.	$(t + 2, 2t, t)$
11.	nemá řešení	33.	$(-2, 3, 1)$
12.	nemá řešení	34.	nemá řešení
13.	nemá řešení	35.	$(2, 3, 5)$
14.	nemá řešení	36.	$(1/2, 3/8, 1/4, 5/4)$
15.	nemá řešení	37.	$(1, 2, 1, 3)$
16.	nemá řešení	38.	$(11, 2, 26, 83)/100$
17.	nemá řešení	39.	$(3, 0, -2, 0, 1)$
18.	nemá řešení	40.	$(-18a + 1, 2a + 3, 11a - 2)$
19.	nemá řešení	41.	$(1, 2, 3)$
20.	$(r, 5r - 4s, s, 7 - 3r + 3s)$	42.	nemá řešení
21.	$(5/2 + t, 1 + 6t, -1/2 - 7t, 2t)$	43.	$(1 - 2a, a, 0)$
22.	$(3 - 6t, 2 - t, t)$	44.	$(a + 3b + 1/2, 19a + 11b - 1, 23b - 2, 23a)$

- |     |   |     |  |
|-----|---|-----|--|
| 45. | $(3, 0, -5, 11)$                            | 68. | $(1 + 2t, 4 + 3t, -t)$   |
| 46. | nemá řešení                                 | 69. | $(0, 0, 0)$  |
| 47. | $(0, 0, 0, 0)$                              | 70. | $k = 3$ , řeš.: $(-1 - 5t, -1 - 2t, t)$ , $k \neq 3$ , nemá řeš. |
| 48. | $(t, 2t, 3t, 4t)$                           | 71. | $k = 5$  |
| 49. | $(-t, t, -3t, 2t)$                          | 72. | $(2t, -4 + t, -1 - t, -t)$                                       |
| 50. | $(r, -5r, 2r + s, s)$                       | 73. | $(-1, -t, 15 - 7t, -7 + 3t, t)$                                  |
| 51. | $(7t, 3t, -2t, t)$                          | 74. | $(t, 2 - t, -s, -7t)$  |
| 52. | $(t, -t, 2t, 3t, 2t)$                       | 75. | $(2, 3, 4, 5)$   |
| 53. | $(2r, -7r - 9s + 7t, 2s, 6r + 8s - 3t, 2t)$ |     |  |
| 54. | $(0, 0, 0)$                                 |     |  |
| 55. | $(3t, 2t, t)$                               |     |  |
| 56. | $(0, 0, 0, 0)$                              |     |  |
| 57. | $(3r - 13s, 19r - 20s, 17r, 17s)$           |     |  |
| 58. | $(7t - s, 5t + s, s, 2t, 6t)$               |     |  |
| 59. | $(-4t + 7s, -4t + 5s, 4t - 5s, 8t, 8s)$     |     |  |
| 60. | $(0, 0, 0, t, t)$                           |     |  |
| 61. | $a \neq 0, a \neq \pm 1$                    |     |  |
| 62. | $(0, 2 + s + 2t, -1 - 2s - 3t, s, t)$       |     |  |
| 63. | $(-7, -3, 2)$                               |     |  |
| 64. | $X = A X + B$                               |     |  |
| 65. | $(4, 1, -5)$                                |     |  |
| 66. | $(t, 0, 9t, 13t)$                           |     |  |
| 67. | $(-10t, 16t, t)$                            |     |  |