Rješenja 5. domaće zadaće

1. $x_1 = x_2 = x_4 = \lambda, x_3 = -\lambda,\ \lambda \in \mathbb{R}$.
2. $D = 12, x = -1, y = -3, z = -1$.
3. $\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix} + \alpha \begin{bmatrix} -2 \\ 2 \\ 1 \end{bmatrix}$.
4. $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} 0 \\ -7/2 \\ 0 \\ -1/2 \end{bmatrix} + \alpha \begin{bmatrix} 1 \\ 2 \\ -3/2 \\ 0 \end{bmatrix}$.
5. $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \end{bmatrix} = \begin{bmatrix} 1 \\ -1 \\ 0 \\ 0 \\ 0 \end{bmatrix} + \alpha \begin{bmatrix} -2 \\ 3 \\ 1 \\ 0 \\ 0 \end{bmatrix} + \beta \begin{bmatrix} -2 \\ 1 \\ 0 \\ 1 \\ 0 \end{bmatrix} + \gamma \begin{bmatrix} -2 \\ 3 \\ 0 \\ 0 \\ 1 \end{bmatrix}$.
6. $x_1 = 1, x_2 = x_3 = x_4 = 0, x_5 = -2$.
7. $f(x) = 2x^2 - x + 3$.
8. $P(x) = x^3 + x^2 + x + 1$.
9. $P(x) = x^4 + x^2 + 1$.
10. $a = -2, \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -3/2 \\ 0 \\ 0 \end{bmatrix} + \alpha \begin{bmatrix} 5 \\ -2 \\ 4 \end{bmatrix}$.
11. Za $\lambda \neq -11$ nema rješenja, za $\lambda = -11$: $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} 5 \\ 1 \\ 0 \\ 0 \end{bmatrix} + \alpha \begin{bmatrix} -4 \\ -1 \\ 1 \\ 0 \end{bmatrix} + \beta \begin{bmatrix} -5 \\ -2 \\ 0 \\ 1 \end{bmatrix}$.
12. $\lambda = -4$: $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -2 \\ -3 \\ 0 \end{bmatrix} + \alpha \begin{bmatrix} 0 \\ 2 \\ 1 \end{bmatrix}$,
    $\lambda \neq -4$: $x_1 = -2, x_2 = -1, x_3 = 1$.
13. $\lambda = -2$: nema rješenja,
    $\lambda = 2$: $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix} + \alpha \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$,
    $\lambda \neq -2, 2$: $x_1 = \frac{\lambda-1}{\lambda+2}, x_2 = \frac{2\lambda}{\lambda+2}, x_3 = \frac{1}{\lambda+2}$.
14. $\lambda = 1$: $x_1 = 1 - \alpha - \beta, x_2 = \alpha, x_3 = \beta$,
    $\lambda = -2$: nema rješenja,
    $\lambda \neq 1, -2$: $x_1 = \frac{-\lambda-1}{\lambda+2}, x_2 = \frac{1}{\lambda+2}, x_3 = \frac{(1+\lambda)^2}{\lambda+2}$.
15. $\lambda = 1$: $x_1 = 1 - \alpha - \beta - \gamma, x_2 = \alpha, x_3 = \beta, x_4 = \gamma$,
    $\lambda = -3$: nema rješenja,
    $\lambda \neq 1, -3$: $x_1 = x_2 = \frac{\lambda+2}{\lambda+3}, x_3 = x_4 = \frac{-1}{\lambda+3}$.

16. $\lambda_1 = 0, v_1 = [-2, 1]^T; \lambda_2 = 5, v_2 = [1, 2]^T$.

17. $\lambda_1 = -3, v_1 = [-6, 1]^T; \lambda_2 = 3, v_2 = [0, 1]^T$.

18. $\lambda_1 = 1, v_1 = [1, 0, 0]^T; \lambda_2 = 2, v_2 = [0, 1, 1]^T; \lambda_3 = -2, v_3 = [0, 1, -1]^T$.

19. $\lambda_1 = 1, v_1 = [1, 0, 0]^T; \lambda_2 = -1, v_2 = [1, -2, 0]^T; \lambda_3 = 2, v_3 = [-1, 2, 3]^T$.

20. $\lambda_1 = 0, v_1 = [1, 2, 1]^T; \lambda_2 = -1, v_2 = [0, 1, 1]^T; \lambda_3 = 2, v_3 = [1, 0, 1]^T$.