Projekt 1. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - x'(t) - 2x(t) = -6t - 9, \quad x(1) = 1,\ x'(1) = 1;$
2. $x''(t) + x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 2;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t + 1, & t \in \langle 0, 2 \rangle, \\ t + 1, & t \in \langle 2, 3 \rangle, \\ 0, & t \geq 3. \end{cases}$$

Projekt 2. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - x'(t) - 2x(t) = t + 4, \quad x(1) = 0,\ x'(1) = 0;$
2. $x''(t) + 2x'(t) + x(t) = f(t), \quad x(0) = 1,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t - 1, & t \in \langle 0, 1 \rangle, \\ -1, & t \in \langle 1, 3 \rangle, \\ -2, & t \geq 3. \end{cases}$$

Projekt 3. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = t + 4, \quad x(1) = 2,\ x'(1) = 0;$
2. $x''(t) - x'(t) = f(t), \quad x(0) = 1,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t + 2, & t \in \langle 0, 2 \rangle, \\ 0, & t \geq 2. \end{cases}$$

Projekt 4. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = -4t, \quad x(1) = 1,\ x'(1) = 0;$
2. $x''(t) + 2x'(t) + x(t) = f(t), \quad x(0) = 2,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -2, & t \in \langle 0, 1 \rangle, \\ 0, & t \in \langle 1, 2 \rangle, \\ 2, & t \geq 2. \end{cases}$$

Projekt 5. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = 2t - 6, \quad x(1) = 1,\ x'(1) = 0;$
2. $x''(t) - x(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t + 1, & t \in \langle 0, 3 \rangle, \\ 1, & t \in \langle 3, 6 \rangle, \\ -1, & t \geq 6. \end{cases}$$

Projekt 6. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - x'(t) - 2x(t) = -6t + 9, \quad x(1) = 0,\ x'(1) = 1;$
2. $x''(t) - x(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -1, & t \in \langle 0, 2 \rangle, \\ 1, & t \geq 2. \end{cases}$$

Projekt 7. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = -4t + 5, \quad x(1) = 1,\ x'(1) = 1;$
2. $x''(t) - x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 2;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ 1, & t \in \langle 0, 3 \rangle, \\ 2, & t \geq 3. \end{cases}$$

Projekt 8. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + x'(t) - 2x(t) = 3t - 1, \quad x(1) = 2,\ x'(1) = 0;$
2. $x''(t) - x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -1, & t \in \langle 0, 3 \rangle, \\ -t - 1, & t \in \langle 3, 4 \rangle, \\ -1, & t \geq 4. \end{cases}$$

Projekt 9. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + x'(t) - 2x(t) = 8t - 2, \quad x(1) = 0,\ x'(1) = 1;$
2. $x''(t) - 2x'(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t + 1, & t \in \langle 0, 3 \rangle, \\ -1, & t \in \langle 3, 4 \rangle, \\ 2, & t \geq 4. \end{cases}$$

Projekt 10. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = 3t + 8, \quad x(1) = 1,\ x'(1) = 1;$
2. $x''(t) - x(t) = f(t), \quad x(0) = 1,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t - 1, & t \in \langle 0, 1 \rangle, \\ -1, & t \geq 1. \end{cases}$$

Projekt 11. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = -2t - 4, \quad x(1) = 0,\ x'(1) = 0;$
2. $x''(t) - x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t + 2, & t \in \langle 0, 1 \rangle, \\ t + 2, & t \in \langle 1, 4 \rangle, \\ 1, & t \geq 4. \end{cases}$$

Projekt 12. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - x'(t) - 2x(t) = 8t - 3, \quad x(1) = 2,\ x'(1) = 2;$
2. $x''(t) + x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t + 2, & t \in \langle 0, 3 \rangle, \\ -t + 1, & t \in \langle 3, 4 \rangle, \\ -2, & t \geq 4. \end{cases}$$

Projekt 13. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = -6t + 8, \quad x(1) = 1,\ x'(1) = 1;$
2. $x''(t) - x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 2;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ 2, & t \in \langle 0, 2 \rangle, \\ -2, & t \geq 2. \end{cases}$$

Projekt 14. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - x'(t) - 2x(t) = t + 3, \quad x(1) = 2,\ x'(1) = 2;$
2. $x''(t) + x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t + 2, & t \in \langle 0, 3 \rangle, \\ 1, & t \in \langle 3, 5 \rangle, \\ -1, & t \geq 5. \end{cases}$$

Projekt 15. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - x'(t) - 2x(t) = -6t + 7, \quad x(1) = 2,\ x'(1) = 0;$
2. $x''(t) - x'(t) = f(t), \quad x(0) = 2,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t - 2, & t \in \langle 0, 2 \rangle, \\ -t + 2, & t \in \langle 2, 5 \rangle, \\ 1, & t \geq 5. \end{cases}$$

Projekt 16. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + x'(t) - 2x(t) = 4t - 1, \quad x(1) = 0,\ x'(1) = 0;$
2. $x''(t) + x'(t) = f(t), \quad x(0) = 1,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t - 1, & t \in \langle 0, 1 \rangle, \\ -1, & t \geq 1. \end{cases}$$

Projekt 17. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = t, \quad x(1) = 1,\ x'(1) = 0;$
2. $x''(t) + x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t - 2, & t \in \langle 0, 2 \rangle, \\ t - 1, & t \in \langle 2, 3 \rangle, \\ -2, & t \geq 3. \end{cases}$$

Projekt 18. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = 8t - 2, \quad x(1) = 2,\ x'(1) = 0;$
2. $x''(t) - 2x'(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ 2, & t \in \langle 0, 1 \rangle, \\ -1, & t \geq 1. \end{cases}$$

Projekt 19. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + x'(t) - 2x(t) = t - 6, \quad x(1) = 0,\ x'(1) = 2;$
2. $x''(t) - x(t) = f(t), \quad x(0) = 1,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t + 2, & t \in \langle 0, 1 \rangle, \\ 1, & t \geq 1. \end{cases}$$

Projekt 20. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = 8t - 2, \quad x(1) = 1,\ x'(1) = 1;$
2. $x''(t) + 2x'(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -1, & t \in \langle 0, 2 \rangle, \\ 1, & t \geq 2. \end{cases}$$

Projekt 21. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - x'(t) - 2x(t) = t + 8, \quad x(1) = 1,\ x'(1) = 0;$
2. $x''(t) - x(t) = f(t), \quad x(0) = 1,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t - 1, & t \in \langle 0, 1 \rangle, \\ 0, & t \geq 1. \end{cases}$$

Projekt 22. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = -2t + 3, \quad x(1) = 1,\ x'(1) = 1;$
2. $x''(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t - 1, & t \in \langle 0, 1 \rangle, \\ t - 2, & t \in \langle 1, 3 \rangle, \\ 2, & t \geq 3. \end{cases}$$

Projekt 23. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = -3t - 3, \quad x(1) = 1,\ x'(1) = 0;$
2. $x''(t) - x(t) = f(t), \quad x(0) = 1,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t + 2, & t \in \langle 0, 3 \rangle, \\ -t - 1, & t \in \langle 3, 6 \rangle, \\ 0, & t \geq 6. \end{cases}$$

Projekt 24. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + x'(t) - 2x(t) = 4t + 4, \quad x(1) = 0,\ x'(1) = 2;$
2. $x''(t) + 2x'(t) + x(t) = f(t), \quad x(0) = 2,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t - 1, & t \in \langle 0, 3 \rangle, \\ -2, & t \in \langle 3, 6 \rangle, \\ 1, & t \geq 6. \end{cases}$$

Projekt 25. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = 8t + 4, \quad x(1) = 1,\ x'(1) = 1;$
2. $x''(t) - 2x'(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 2;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t - 1, & t \in \langle 0, 2 \rangle, \\ -2, & t \geq 2. \end{cases}$$

Projekt 26. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + x'(t) - 2x(t) = -7t - 1, \quad x(1) = 0,\ x'(1) = 0;$
2. $x''(t) - x'(t) = f(t), \quad x(0) = 1,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t - 2, & t \in \langle 0, 1 \rangle, \\ 1, & t \geq 1. \end{cases}$$

Projekt 27. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = 5t - 2, \quad x(1) = 2,\ x'(1) = 2;$
2. $x''(t) - 2x'(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t + 1, & t \in \langle 0, 1 \rangle, \\ -1, & t \in \langle 1, 4 \rangle, \\ 2, & t \geq 4. \end{cases}$$

Projekt 28. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - x'(t) - 2x(t) = -8t + 6, \quad x(1) = 1,\ x'(1) = 0;$
2. $x''(t) + x'(t) = f(t), \quad x(0) = 0,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t - 2, & t \in \langle 0, 2 \rangle, \\ -2, & t \geq 2. \end{cases}$$

Projekt 29. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = -2t + 10, \quad x(1) = 2,\ x'(1) = 2;$
2. $x''(t) + 2x'(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t - 1, & t \in \langle 0, 1 \rangle, \\ t, & t \in \langle 1, 4 \rangle, \\ -2, & t \geq 4. \end{cases}$$

Projekt 30. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) - 3x'(t) + 2x(t) = -8t + 8, \quad x(1) = 0,\ x'(1) = 1;$
2. $x''(t) - x(t) = f(t), \quad x(0) = 1,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t + 2, & t \in \langle 0, 3 \rangle, \\ 1, & t \geq 3. \end{cases}$$

Projekt 31. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = t - 1, \quad x(1) = 1,\ x'(1) = 1;$
2. $x''(t) + x'(t) = f(t), \quad x(0) = 1,\ x'(0) = 1;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -t + 2, & t \in \langle 0, 2 \rangle, \\ -1, & t \in \langle 2, 4 \rangle, \\ -2, & t \geq 4. \end{cases}$$

Projekt 32. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + x'(t) - 2x(t) = -1t + 8, \quad x(1) = 1,\ x'(1) = 0;$
2. $x''(t) - 2x'(t) + x(t) = f(t), \quad x(0) = 2,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -1, & t \in \langle 0, 1 \rangle, \\ 1, & t \geq 1. \end{cases}$$

Projekt 33. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = 8t - 6, \quad x(1) = 2,\ x'(1) = 2;$
2. $x''(t) - 2x'(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 0;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ -2, & t \in \langle 0, 2 \rangle, \\ -t + 2, & t \in \langle 2, 3 \rangle, \\ 1, & t \geq 3. \end{cases}$$

Projekt 34. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + x'(t) - 2x(t) = 8t - 8, \quad x(1) = 0,\ x'(1) = 0;$
2. $x''(t) - 2x'(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 2;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t - 2, & t \in \langle 0, 1 \rangle, \\ -1, & t \geq 1. \end{cases}$$

Projekt 35. *Vypočtěte pomocí Laplaceovy transformace:*

1. $x''(t) + 3x'(t) + 2x(t) = 5t + 9, \quad x(1) = 0,\ x'(1) = 0;$
2. $x''(t) + x(t) = f(t), \quad x(0) = 0,\ x'(0) = 2;$ *kde*

$$f(t) = \begin{cases} 0, & t < 0, \\ t + 2, & t \in \langle 0, 2 \rangle, \\ t - 2, & t \in \langle 2, 5 \rangle, \\ 1, & t \geq 5. \end{cases}$$
