

Řešte diferenciální rovnice:

1. $y'' = y$. $[y = c_1 e^x + c_2 e^{-x}]$
2. $y'' - 5y' + 6y = 0$. $[y = c_1 e^{2x} + c_2 e^{3x}]$
3. $y'' - 2y' + y = 0$. $[y = c_1 e^x + c_2 x e^x]$
4. $y'' + y = 0$. $[y = c_1 \sin x + c_2 \cos x]$
5. $y'' - y = 1$. $[y = -1 + c_1 e^x + c_2 e^{-x}]$
6. $y'' + 2y' + y = x^2$. $[y = x^2 - 4x + 6 + c_1 e^{-x} + c_2 x e^{-x}]$
7. $y'' - 6y' + 8y = 0$ $[y = c_1 e^{2x} + c_2 e^{4x}]$
8. $y'' + 6y' + 9y = 0$ $[y = c_1 e^{-3x} + c_2 x e^{-3x}]$
9. $y'' + 4y = 0$ $[y = c_1 \cos 2x + c_2 \sin 2x]$
10. $y'' - y' + y = 0$ $\left[y = e^{\frac{x}{2}} \left(c_1 \cos \frac{\sqrt{3}}{2} x + c_2 \sin \frac{\sqrt{3}}{2} x \right) \right]$
11. $y'' + y' - 2y = 0, y(0) = 0, y'(0) = 2$ $\left[\frac{2}{3} e^x - \frac{2}{3} e^{-2x} \right]$
12. $y'' + 4y' + 23y = 0, y(0) = 0, y'(0) = 3$ $[y = 1,5 e^{-2x} \sin \sqrt{19} x]$
13. $y'' + 6y' + 9y = 0, y(0) = -6, y'(0) = 4$ $[y = e^{-3x} (-6 - 14x)]$
14. $y'' - 4y' + 3y = 0; y(0) = 6, y'(0) = 10$ $[y = 4e^x + 2e^{3x}]$
15. $4y'' - 8y' + 5y = 0$ $[y = e^x (C_1 \cos \frac{x}{2} + C_2 \sin \frac{x}{2})]$
16. $y'' - 2y' + 2y = 0; y(0) = 0, y'(0) = 1$ $[y = e^x \sin x]$
17. $y'' - 2y' + y = 6x e^x$ $[y = (C_1 + C_2 x + x^3) e^x]$
18. $y'' + y = 4x e^x$ $[y = C_1 \cos x + C_2 \sin x + (2x - 2) e^x]$
19. $y'' + y' - 2y = 3x e^x$ $[y = C_1 e^x + C_2 e^{-2x} + (\frac{x^2}{2} - \frac{x}{3}) e^x]$
20. $y'' + 9y = 6e^{3x}; y(0) = y'(0) = 0$ $[y = -\frac{1}{3} (\cos 3x + \sin 3x - e^{3x})]$
21. $y'' - 4y' + 5y = 2x^2 e^x; y(0) = 2, y'(0) = 3$ $[y = e^{2x} (\cos x - 2 \sin x) + (x+1)^2 e^x]$