LINEÁRNÍ ROVNICE S KONSTANTNÍMI KOEFICIENTY – VARIACE KONSTANT

1. $y'' - y = \frac{e^x - e^{-x}}{e^x + e^{-x}}$

2. $y'' - 2y' + y = \frac{e^x}{x^2 + x + 1}$

3. $y'' + y = \operatorname{tg} x$

4. $y'' + 3y' + 2y = \frac{1}{e^x + 1}$

5. $y'' - 3y' + 2y = \frac{e^{2x}}{\sqrt{1 - e^{2x}}}$

EULEROVY ROVNICE

6. $x^2 y'' - 9xy' + 21y = 0$

7. $x^2 y'' + xy' + y = x$

8. $y'' - \frac{y'}{x} + \frac{y}{x^2} = \frac{2}{x}$

9. $x^2 y'' - 2xy' + 2y + x - 2x^3 = 0$

10. $x^4 y^{(4)} + 6x^3 y''' - 6xy' + 12y = x^2$

_ _

VÝSLEDKY.　　**1.** $y = e^x(1 + e^{2x})\operatorname{arctg} e^x + ce^x + de^{-x}$, $x \in \mathbf{R}$　　**2.** $y = \left(c + dx - \frac{1}{2}\log(x^2 + x + 1) + \frac{2x+1}{\sqrt{3}}\operatorname{arctg}\frac{2x+1}{\sqrt{3}}\right)e^x$, $x \in \mathbf{R}$　　**3.** $y = -\cos x \log\frac{1+\sin x}{|\cos x|} + c\cos x + d\sin x$, $x \in \left(-\frac{\pi}{2} + k\pi, \frac{\pi}{2} + k\pi\right)$, $k \in \mathbf{Z}$　　**4.** $y = \log(e^x + 1)(e^{-x} + e^{-2x}) + ce^{-x} + de^{-2x}$, $x \in \mathbf{R}$　　**5.** $y = -e^x \arcsin e^x - \frac{1}{2}e^{2x}\log\frac{1-\sqrt{1-e^{2x}}}{1+\sqrt{1-e^{2x}}} + ce^x + de^{2x}$, $x \in (-\infty, 0)$　　**6.** $y(x) = \begin{cases} a_1 x^3 + b_1 x^7, & x < 0, \\ 0, & x = 0, a_1, b_1, a_2, b_2 \in \mathbf{R} \\ a_2 x^3 + b_2 x^7, & x > 0, \end{cases}$

7. $y(x) = \frac{1}{2}x + a\cos\log|x| + b\sin\log|x|$, $x \in (-\infty, 0)$ nebo $x \in (0, +\infty)$, $[a, b] \in \mathbf{R}^2 \setminus \{[0,0]\}$; $y(x) = \frac{1}{2}x$, $x \in \mathbf{R}$　　**8.** $y(x) = x\log^2|x| + ax + bx\log|x|$, $x \in (-\infty, 0)$ nebo $x \in (0, +\infty)$, $a, b \in \mathbf{R}$　　**9.** $y(x) = x^3 + x + x\log|x| + ax + bx^2$, $x \in (-\infty, 0)$ nebo $x \in (0, +\infty)$, $a, b \in \mathbf{R}$　　**10.** $y(x) = \frac{1}{4}x^2\log|x| + ax^2 + \frac{b}{x^2} + c|x|^{\sqrt{3}} + \frac{d}{|x|^{\sqrt{3}}}$, $x \in (-\infty, 0)$ nebo $x \in (0, +\infty)$, $a, b, c, d \in \mathbf{R}$.