Řešte lineární diferenciální rovnici prvního řádu $y' + a(x)y = b(x)$:

1) $(x+1)y' - 2y = (x+1)^4 \qquad x > -1$

$$[y = (\tfrac{x^2}{2} + x + c)(x+1)^2]$$

2) $(2x+1)y' + y = \sqrt{2x+1} + 3$

$$[y = \tfrac{1}{\sqrt{2x+1}}(c + x + 3 \cdot \sqrt{2x+1})]$$

3) $y' \cos x + y \sin x = 1 \qquad x \in (-\tfrac{\pi}{2}, \tfrac{\pi}{2})$

$$[y = (c + \operatorname{tg} x) \cdot \cos x]$$

4) $y' + \tfrac{1}{x+1} \cdot y = \ln(x+1) \qquad x > -1$

$$[y = \tfrac{x+1}{2} \cdot \ln(x+1) - \tfrac{x+1}{4} + \tfrac{c}{x+1}]$$

5) $y' + y \cos x = 2 \sin x \cos x$

$$[y = 2(-1 + \sin x) + ce^{-\sin x}]$$

6) $y' \cos x = (y + 2\cos x)\sin x \qquad x \in (-\tfrac{\pi}{2}, \tfrac{\pi}{2})$

$$[y = \tfrac{1}{2}\left(\tfrac{\sin^2 x}{\cos x} - \cos x + \tfrac{c}{\cos x}\right)]$$

7) $y' = 1 + \tfrac{2x-1}{x^2} \cdot y$

$$[y = x^2 + cx^2 e^{\frac{1}{x}}]$$

8) $y' + y = x$

$$[y = x - 1 + ce^{-x}]$$

9) $y' + y = \cos x$

$$[y = \tfrac{1}{2}(\sin x + \cos x) + c \cdot e^{-x}]$$

10) $xy' + y = x^2 \qquad x > 0$

$$[y = \tfrac{x^2}{3} + \tfrac{c}{x}]$$

11) $(1 + x^2) \cdot y' - xy = 1$

$$[y = x + c \cdot \sqrt{x^2 + 1}]$$

12) $xy' + 2y = e^{-x^2}$

$$[y = \tfrac{1}{2x^2}\left(c - e^{-x^2}\right)]$$

13) $y' \cos x - y \sin x = \sin 2x \qquad x \in (-\tfrac{\pi}{2}, \tfrac{\pi}{2})$

$$[y = \tfrac{1}{\cos x}\left(c - \tfrac{\cos 2x}{2}\right)]$$

14) $xy' - \tfrac{y}{x+1} = x \qquad x > 0$

$$[y = \tfrac{x}{x+1}(c + x + \ln x)]$$

15) $y' + \tfrac{x}{x^2-1}y = \tfrac{\arcsin x}{1-x^2}, x \in (-1,1)$

$$[y = \tfrac{1}{2\sqrt{1-x^2}}[c + \arcsin^2 x]]$$

16) $y' - y = \tfrac{1+x^2}{x}e^x$

$$[y = e^x(c + \tfrac{x^2}{2} + \ln|x|)]$$

17) $y' - y \operatorname{tg} x = \sin x$

$$[y = -\tfrac{\cos x}{2} + \tfrac{c}{\cos x}]$$