

Vyřešte diferenciální rovnici

$$(1) \cos(x) y' + \sin(x) y = 1.$$

$$(11) x y' - y = x \ln(x).$$

$$(2) y' - y = e^{2x}.$$

$$(12) x y' - y = \sqrt{x}.$$

$$(3) x^2 y' + y = 1.$$

$$(13) y' - 2x y = -x.$$

$$(4) y' + \frac{1}{x+1} y = \sin(x).$$

$$(14) y' + y = x^2.$$

$$(5) y' + y \cotg(x) = 1.$$

$$(15) x^2 y' + x y = 1.$$

$$(6) x^2 y' + x y = x^2 + 1.$$

$$(16) x y' - y = x^2 e^{-x}.$$

$$(7) y' + \frac{1}{x} y = 2.$$

$$(17) (x^2 + 1) y' - 2x y = x.$$

$$(8) \sin(x) y' - \cos(x) y = \sin^3(x).$$

$$(18) y' + \sin(x) y = \sin(x).$$

$$(9) x y' - 2y = x^3.$$

$$(19) y' + \operatorname{tg}(x) y = \sin(2x).$$

$$(10) \operatorname{tg}(x) y' + y = \sin(x).$$

$$(20) x^2 y' - x y = 1.$$

Vyřešte diferenciální rovnici

(1) $y = c \cos(x) + \sin(x)$, $c \in \mathbb{R}$.

(2) $y = ce^x + e^{2x}$, $c \in \mathbb{R}$.

(3) $y = ce^{\frac{1}{x}} + 1$, $c \in \mathbb{R}$.

(4) $y = \frac{c}{x+1} + \frac{\sin(x) - x \cos(x) - \cos(x)}{x+1}$, $c \in \mathbb{R}$.

(5) $y = \frac{c}{\sin(x)} - \cotg(x)$, $c \in \mathbb{R}$.

(6) $y = \frac{c}{x} + \frac{x}{2} + \frac{\ln(x)}{x}$, $c \in \mathbb{R}$.

(7) $y = \frac{c_1}{x} + x$, $c_1 \in \mathbb{R}$.

(8) $y = c \sin(x) - \sin(x) \cos(x)$, $c \in \mathbb{R}$.

(9) $y = cx^2 + x^3$, $c \in \mathbb{R}$.

(10) $y = \frac{1}{2} \sin(x) + \frac{c}{\sin(x)}$, $c \in \mathbb{R}$.

(11) $y = cx + \frac{1}{2}x \ln^2(x)$, $c \in \mathbb{R}$.

(12) $y = cx - 2\sqrt{x}$, $c \in \mathbb{R}$.

(13) $y = \frac{1}{2} + ce^{x^2}$, $c \in \mathbb{R}$.

(14) $y = ce^{-x} + x^2 - 2x + 2$, $c \in \mathbb{R}$.

(15) $y = \frac{c}{x} + \frac{\ln(x)}{x}$, $c_1 \in \mathbb{R}$.

$$(16) \quad y = cx - xe^{-x}, \quad c \in \mathbb{R}.$$

$$(17) \quad y = -\frac{1}{2} + c(x^2 + 1), \quad c \in \mathbb{R}.$$

$$(18) \quad y = ce^{\cos(x)} + 1, \quad c \in \mathbb{R}.$$

$$(19) \quad y = c\cos(x) - 2\cos^2(x), \quad c_1 \in \mathbb{R}.$$

$$(20) \quad y = cx - \frac{1}{2x}, \quad c \in \mathbb{R}.$$