

6 ROVNICE SO SEPAROVATEĽNÝMI PREMENNÝMI

Riešte začiatočnú úlohu a nájdite definičný obor riešenia.

1. $x' = tx, \quad x(0) = 1,$
2. $x' = tx^2, \quad x(0) = 0,$
3. $x' = tx^2, \quad x(0) = 1,$
4. $x' = tx^{-2}, \quad x(0) = 1,$
5. $x' = x^2 - 1, \quad x(0) = \frac{1}{2},$
6. $x' = \sin t(x^2 - 1), \quad x(0) = \frac{1}{2},$
7. $x' = x^2 - 1, \quad x(0) = \frac{3}{2},$
8. $x' = \frac{1}{xt}, \quad x(1) = 1,$
9. $x' = \frac{1+t}{x-1}, \quad x(0) = 2,$
10. $x' = x \ln x, \quad x(t_0) = x_0,$
11. $x' = \frac{1+x^2}{x}t, \quad x(1) = 1.$

Výsledky.

1. $x(t) = \exp\left(\frac{t^2}{2}\right) \quad t \in R$
2. $x(t) = 0 \quad t \in R$
3. $x(t) = -\frac{2}{t^2-2} \quad t \in (-\sqrt{2}, \sqrt{2})$
4. $x(t) = \sqrt{[3]_{\frac{3}{2}}t^2 + 1} \quad t \in R$
5. $x(t) = \frac{3-e^{2t}}{3+e^{2t}} \quad t \in R$
6. $x(t) = \frac{3-e^{2-2\cos t}}{3+e^{2-2\cos t}} \quad t \in R$
7. $x(t) = \frac{5+\exp 2t}{5-\exp 2t} \quad t \in (-\infty, \ln \sqrt{5})$
8. $x(t) = \sqrt{1+2\ln t} \quad t \in (0, \infty)$
9. $x(t) = 2+t \quad t \in (-1, \infty)$
10. $x(t) = e^{e^{(t-t_0)\ln x_0}} \quad t \in R$
11. $x(t) = \sqrt{2e^{(t^2-1)} - 1} \quad t \in (\sqrt{1-\ln 2}, \infty)$