Příklad 2. $y' + \frac{y}{x} = \frac{x}{y}$; [8b]

homogenní: $y = xR$;

$y' = xR' + R$ 2

$xR' + R + R = \frac{1}{R}$

$xR' = \frac{1}{R} - 2R = \frac{1-2R^2}{R}$; $R \neq \pm\frac{1}{\sqrt{2}}$ 1

$R' \frac{R}{1-2R^2} = \frac{1}{x}$ 1

$-\frac{1}{4}\ln|1-2R^2| = \ln|x| + C_1$ 1

$|1-2R^2| = \frac{C_2}{x^4}$

$1-2R^2 = \frac{C_3}{x^4}$

$R^2 = \frac{1}{2} - \frac{C_3}{2x^4}$

$R = \pm\sqrt{\frac{1}{2} - \frac{C}{2x^4}}$

$1 - \frac{C_3}{x^4} > 0$

$1 > \frac{C_3}{x^4}$

$x^4 > C_3$

$R = \pm\sqrt{\frac{x^4-C}{2x^4}} =$

$= \pm\frac{\sqrt{x^4-C}}{\sqrt{2}\cdot x^2}$

$y = \pm\frac{\sqrt{x^4-C}}{\sqrt{2}\cdot x}$

$C_3 \leq 0$: $x \in (-\infty, 0)$ $(0, +\infty)$

$C_3 > 0$: $|x| > \sqrt[4]{C_3}$. 2

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