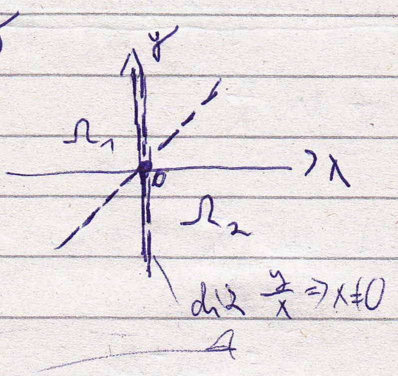
Př. $y' = f\left(\frac{y}{x}\right)$ $\qquad y' = \frac{y}{x-y}$



① $f(x,y) = \frac{y}{x-y}$; $\quad y \neq x$

$$\frac{\partial f}{\partial y} = \frac{(x-y)+y}{(x-y)^2}$$

$$y' = \frac{y/x}{1-y/x}$$

subst: $u(x) = \frac{y(x)}{x}$

$y(x) = u(x)\cdot x$

$y'(x) = u'(x)\cdot x - u(x)$

$$u'(x)\cdot x + u(x) = \frac{u}{1-u}$$

$$du \cdot x = \frac{u - u + u^2}{1-u} = \frac{u^2}{1-u}$$

$u \neq 0$; $x \neq 0$

$$\frac{1-u}{u^2}\, du = \frac{dx}{x}$$

$$\int \frac{1-u}{u^2}\, du = \int \frac{dx}{x}$$

$-\frac{1}{u} - \ln|u| = \ln|x| + C$

$-\frac{x}{y} - \ln\left|\frac{y}{x}\right| = \ln|x| + C$

$-\frac{x}{y} = \ln|y| + C$

$y \equiv 0$ … řešení výjimečné

$\cancel{xy' = y(\ln y - \ln x)}$