Nový nadpis 16.10.2013

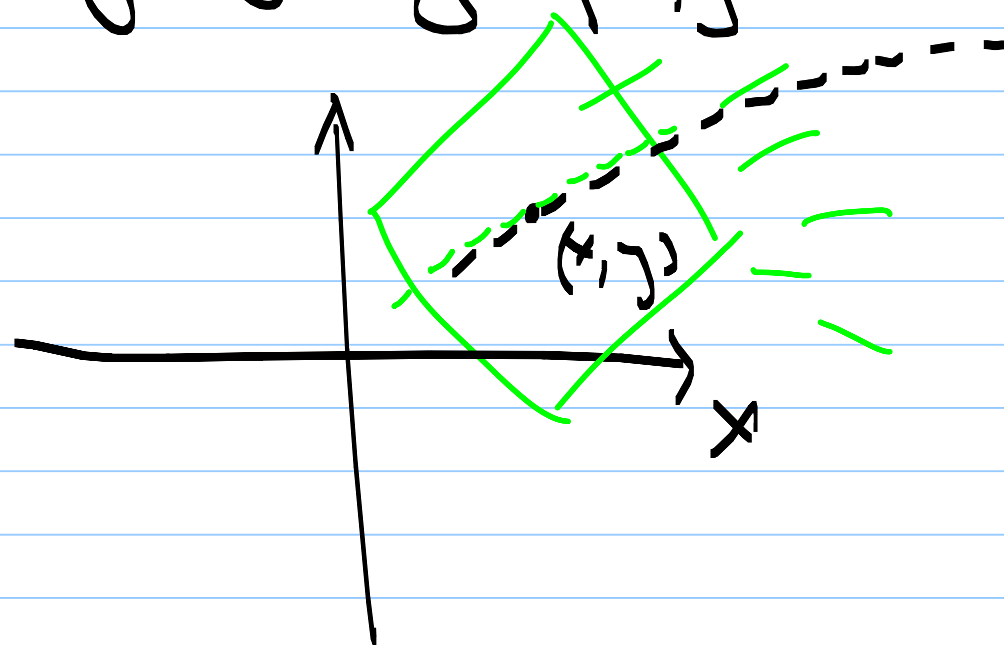
$$\frac{dy}{dx} = f(x,y)$$

$$\boxed{dy = f(x,y)\,dx}$$

$$g(x,y)\,dy + f(x,y)\,dx = 0$$

$$dy = f(y)\,g(x)\,dx$$

$$\int \frac{1}{f(y)}\,dy = \int g(x)\,dx$$



$$f(x,y) = \varphi(x)\psi(y) \qquad f = \varphi\psi$$

$$f_x = \varphi'\psi \qquad f_y = \varphi\psi' \qquad f_{xy} = \varphi'\psi'$$

$$\boxed{\begin{vmatrix} f & f_x \\ f_y & f_{xy} \end{vmatrix} = 0} \qquad \frac{f_{xy}}{\boxed{f_x}} = \frac{\psi'}{\psi} = (\ln\psi)'$$

$$|L(y)(t) - L(z)(t)| = \left| \int_{t_0}^{t} f(s, y(s)) - f(s, z(s))\, ds \right|$$

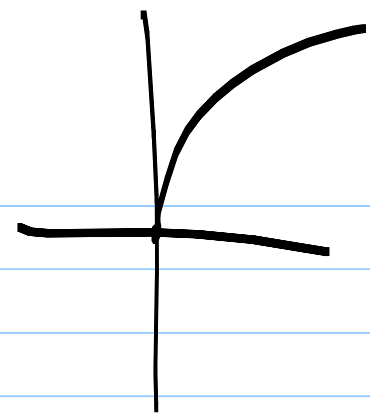
$$\le \int_{t_0}^{t} |f(s, y(s)) - f(s, z(s))|\, ds$$

$$\le C \int_{t_0}^{t} |y(s) - z(s)|\, ds \le D\, |t - t_0|$$

$$|L(y)(t) - L(z)(s)| \le D\, |t - s|$$

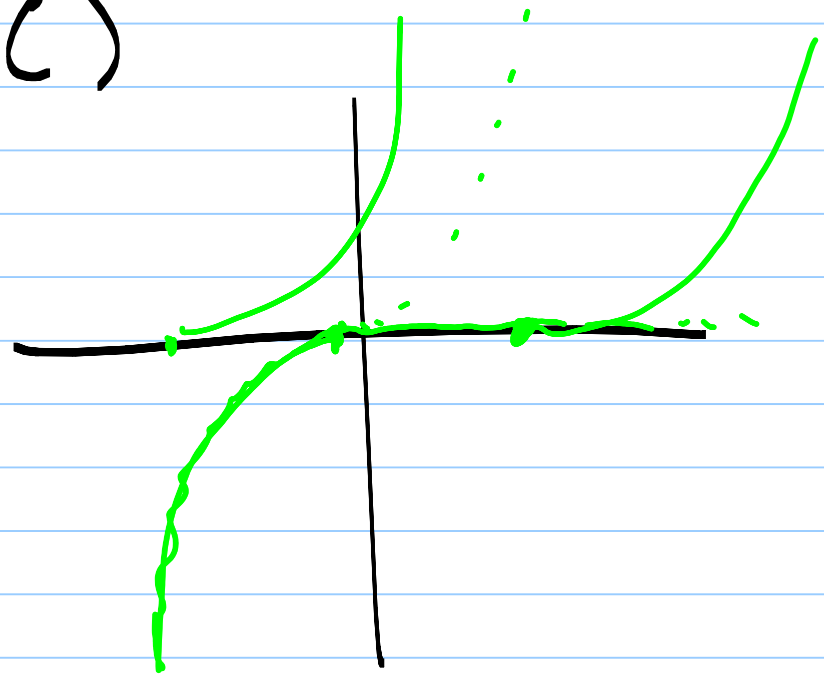
dh. sog. $\mapsto$ Lipschitz.

$$y' = \sqrt{|y|}$$



$$y(t) = \frac{1}{4}(t+c)^2$$

für $y > 0$



$$y \equiv 0$$

$$x_i(t) = x_i(t_0) + \int_{t_0}^{t} f_i(t, x_1(s), \dots, x_k(s))\, ds$$

sraléy ts veltoy

$$\dot{x}_0 = 1$$

$$\dot{x}_1 = f_1(x_0, x_1, \dots, x_n, \alpha_1, \dots, \alpha_k)$$

$$\vdots$$

$$\dot{x}_n = f_n(x_0, x_1, \dots, x_n, \alpha_1, \dots, \alpha_k)$$

$$\dot{\alpha}_1 = 0$$

$$\vdots$$

$$\dot{\alpha}_k = 0$$

$$\dot{x}_1 = f_1(x_1, \dots, x_n, z_1, \dots, z_n) \qquad t_0 = 0$$

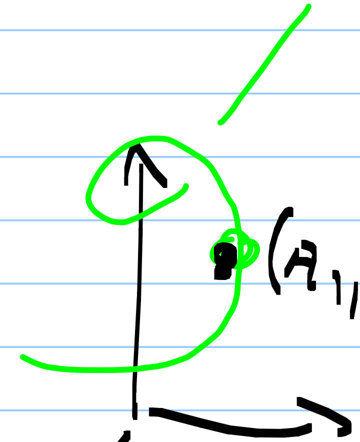
$$\vdots$$

$$\dot{x}_n = f_n(\cdot / \cdot)$$

$$\boxed{x(t, z_1, \dots, z_n)}$$

$$\dot{x} = f(x)$$

$$\ddot{x} = D^1 f(x) \cdot \dot{x}$$


(A_1, z_2, z_3)

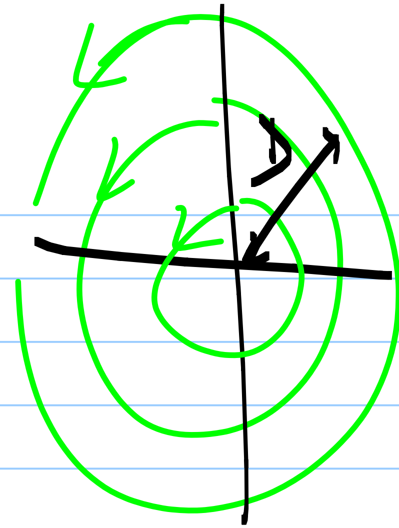
$$\boxed{D_z^1 x(t, z)}$$

$$\phi'(t, z) = D^1 f(x(t, z)) \cdot \phi(t, z)$$

$$\boxed{\phi' = A \cdot \phi}$$

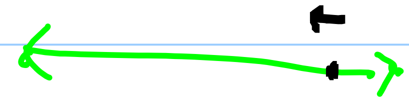
$$\boxed{y'' = -y}$$

$$\boxed{\begin{aligned} y_0' &= y_1 \\ y_1' &= -y_0 \end{aligned}}$$



$$y'' + y = 0$$

$$\lambda^2 + 1 = 0 \Rightarrow \lambda = \pm i$$



$$C_1 e^{it} + C_2 e^{-it}$$

$$\frac{1}{2}\left(e^{it} + e^{-it}\right) = \cos t$$

harm. oscillator

$$\frac{1}{2i}\left(e^{it} - e^{-it}\right) = \sin t$$

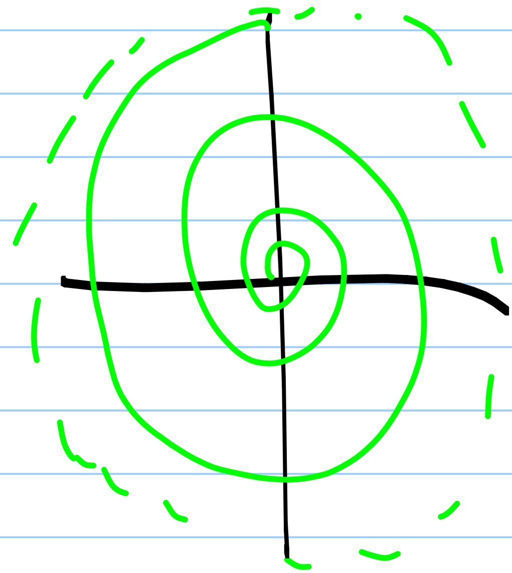
α

$$\boxed{D_1 \cos t + D_2 \sin t}$$

$$\boxed{D \cos(t - \tau) + D \sin(t - \tau)}$$

$$y'' = -y - \alpha y'$$

$$\lambda^2 + \alpha\lambda + 1 = 0 \Rightarrow \lambda_{1,2} = \frac{-\alpha \pm \sqrt{\alpha^2 - 4}}{2}$$



$e^{\lambda t}, \; te^{\lambda t}, \; t^2 e^{\lambda t}$

$\boxed{y' = ay} + b(t)$