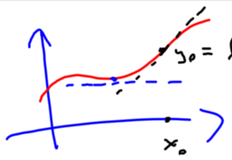


lineární:

$x \mapsto ax = y$

$x = \frac{1}{a} \cdot y$

pro $a \neq 0$

$dy = a \cdot dx$

$F: \mathbb{R}^n \to \mathbb{R}^n$

$A = (a_{ij})$

$x \mapsto A \cdot x$

$DF = \left(\frac{\partial F^i}{\partial x_j}\right) = a_{ij}$

$D(F^{-1}) = A^{-1}$

10 3-14:05

$F(x, y) = 0$, $x \in \mathbb{R}^m$, $y \in \mathbb{R}^n$

$F = (x-s)^2 + (y-t)^2 = r^2$

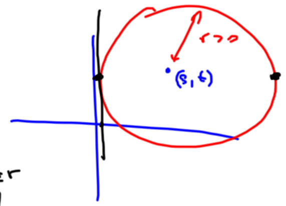
$x^2 + y^2 = r^2$

$\Rightarrow \quad y = y(x)$

$F_y = 2(y-t)$

$y = t \quad x = s \pm r$

$\Rightarrow \boxed{F_y = 0}$



10 3-14:13

$f(x) = t + \sqrt{(x-s)^2 - r^2}$

$f'(x) = \frac{1}{2}\left((x-s)^2 - r^2\right)^{-1/2} \cdot 2(x-s) = \frac{x-s}{y-t}$

$F(x,y) = F(x, f(x)) = 0$

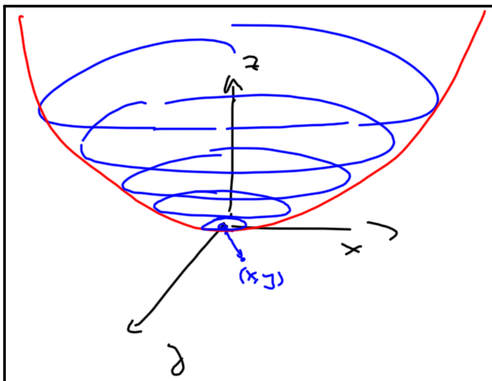
$x \mapsto (x, f(x)) \xmapsto{F} F(x, f(x))$

$\boxed{F_y \neq 0}$

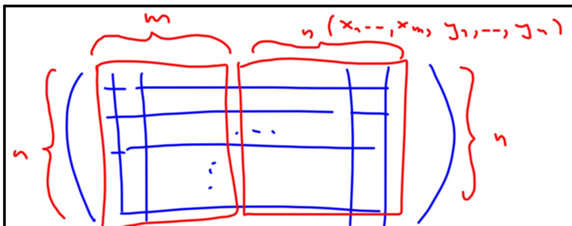
$0 = dF = F_x\, dx + F_y\, f'(x)\, dx$

$= \underbrace{\left(F_x + F_y \cdot f'(x)\right)}_{=0} dx \Rightarrow f'(x) = \frac{-F_x}{F_y}$

10 3-14:23



10 3-14:30



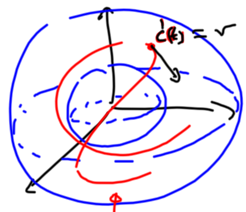
$D_x' F$

$\boxed{D_y' F}$

$\boxed{m \times n - \text{matice}}$

regulární

10 3-14:36



$F(x,y,z) = x^2 + y^2 + z^2$

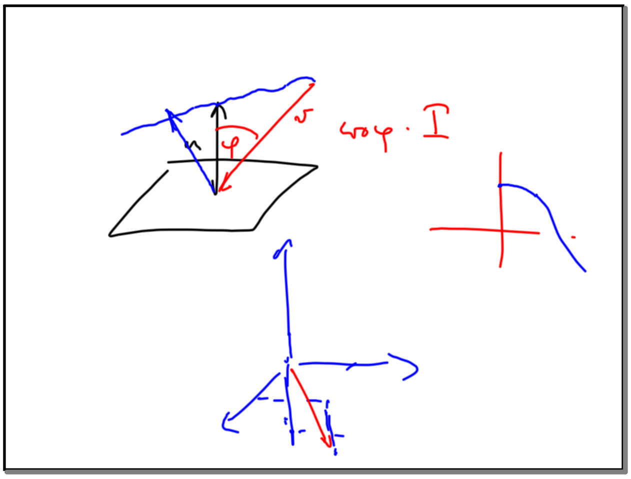
$F(x,y,z) = r^2$

$c(t) = (x(t), y(t), z(t))$

$\frac{d\,F(c(t))}{dt} = \left(F_x \cdot x' + F_y \cdot y' + F_z \cdot z'\right)(t)$

$d_v F = 0$ pro $v \in$ tečné rovině

10 3-15:09



10 3-15:19

$$D^1 f^i = \left(\frac{\partial f^i}{\partial x^1}, \dots, \frac{\partial f^i}{\partial x^{m+n}} \right)$$

$i = 1, \dots, n$

proměnné $x_1, \dots, x_{m+n}$

$\frac{m+n+n}{\text{rovnic}}$ $\qquad$ $m+n+n$

$\lambda_1, \dots, \lambda_n$

grad $h = (3x^2, 3y^2, 3z^2)$

normálový vektor: $\langle (2x, 2y, 2z) \rangle$ n

grad $h = \lambda n$

10 3-15:35