

$f: \mathbb{R}^2 \rightarrow \mathbb{R}, A \in \mathbb{R}^2, f(A) \in \mathbb{R}$

$\text{grad } f: \mathbb{R}^2 \rightarrow \mathbb{R}^2, \text{grad } f(A) \in \mathbb{R}^2$

$D_v f(A)$ je derivace funkce f v bodě A podle vektoru v

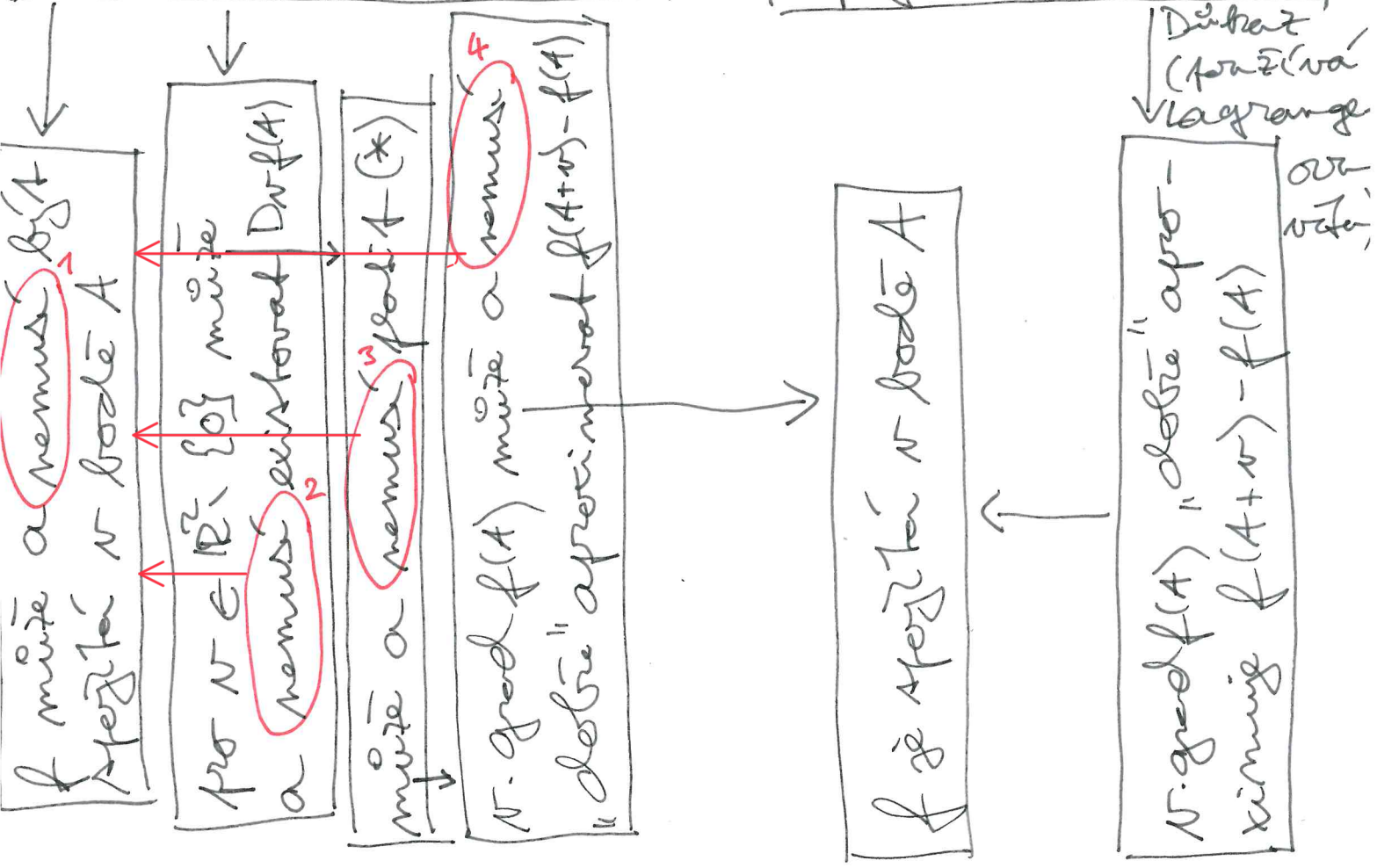
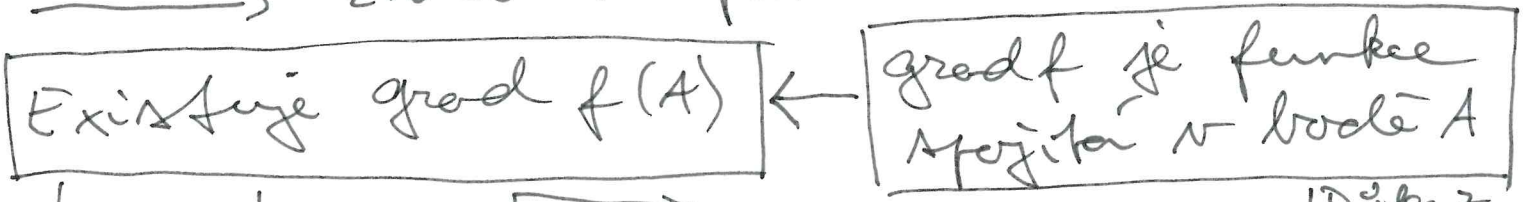
(*) značí vztah $D_v f(A) = v \cdot \text{grad } f(A)$

"dobrá" aproximace $f(A+v) - f(A)$

výrazem $v \cdot \text{grad } f(A)$ zhrnuje:

$$\lim_{v \rightarrow 0} \frac{f(A+v) - f(A) - v \cdot \text{grad } f(A)}{\|v\|} = 0$$

→ značí implikaci



Kandidati na funkcii A vlastostima

1, 2, 3, 4:

$$\begin{cases} 1 & \text{pro } y=x^2, (x,y) \neq (0,0) \\ 0 & \text{linak} \end{cases}$$

$$\begin{cases} 0 & \text{pro } (x,y) = (0,0) \\ \frac{x^2 y}{x^4 + y^2} & \text{linak} \end{cases}$$

$$\begin{cases} 0 & \text{pro } (x,y) = (0,0) \\ \frac{x^4 y^2}{x^8 + y^4} & \text{linak} \end{cases}$$

~~...~~

$$\sqrt{x^2 + y^2}$$

$$\begin{cases} 0 & (x,y) = (0,0) \\ \frac{x^2 y}{x^2 + y^2} & \text{linak} \end{cases}$$

$$\begin{cases} 0 & (x,y) = (0,0) \\ \frac{xy}{\sqrt{x^2 + y^2}} & \text{linak} \end{cases}$$