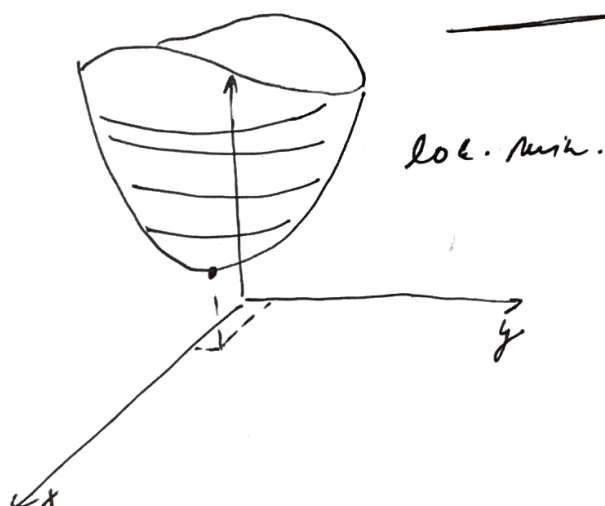


Funkce dvou proměnných

- Lokální extrém

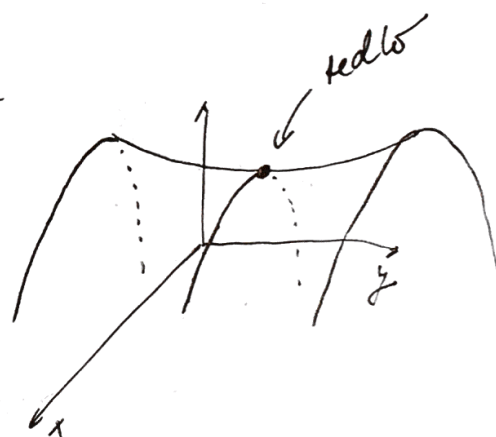


Postup:

- 1) STAC. BODY $\begin{matrix} f_x = 0 \\ f_y = 0 \end{matrix}$
- (2) Body, ve kt. existuje derivace)
- 3) Pomocí druhé derivace ověříme, zda se jedná o extrém

$$D = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{yx} & f_{yy} \end{vmatrix} = f_{xx} \cdot f_{yy} - (f_{xy})^2$$

$$D = \begin{cases} > 0 & \begin{cases} f_{xx} > 0 \dots \text{lok. min} \\ f_{xx} < 0 \dots \text{lok. max} \end{cases} \\ < 0 & \dots \text{nejedná se o extrém} \\ = 0 & \dots \text{nelze rozhodnout} \end{cases}$$



(Pr)

$$f(x,y) = 4x^2 + 2y^2 - 2xy - 10y - 2x$$

$$1) f_x = 8x - 2y - 2 = 0$$

$$f_y = 4y - 2x - 10 = 0$$

$$+ \begin{cases} 8x - 2y = 2 & (\cdot 2) \\ -2x + 4y = 10 \end{cases}$$

$$14x = 14 \Rightarrow x = 1$$

$$8 - 2y - 2 = 0$$

$$6 - 2y = 0$$

$$2y = 6$$

$$y = 3$$

$$A = \begin{bmatrix} 1 & 3 \end{bmatrix}$$

(2)

$$3) f_{xx} = 8$$

$$f_{xy} = f_{yx} = -2$$

$$f_{yy} = 4$$

$$D = \begin{vmatrix} 8 & -2 \\ -2 & 4 \end{vmatrix} = 32 - 4 = 28 > 0 \dots \vee 6 \cdot 4$$

je lok. ext.

$$f_{xx} = 8 > 0 \Rightarrow \text{lok. min.}$$