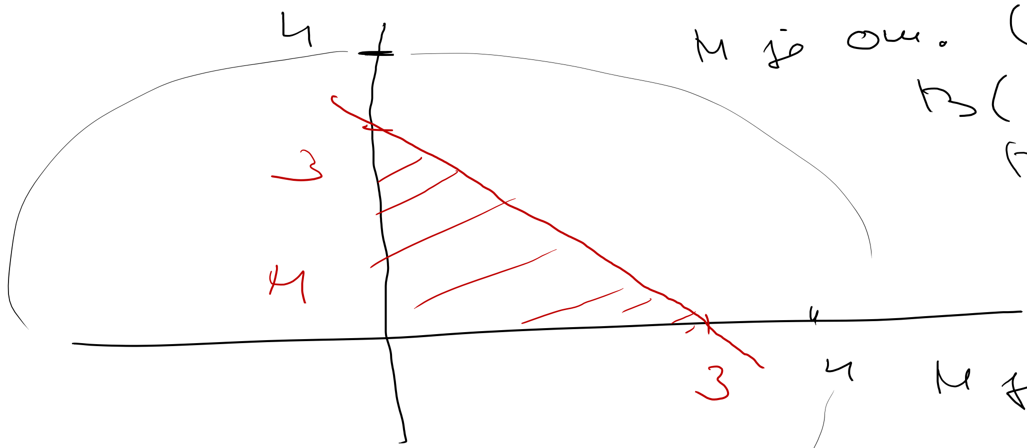
glob (4)

$f(x,y) = x^2 - 2y^2 + 4xy - 6x - 1$ $\qquad D_f = \mathbb{R}^2$

$M: \quad x \geq 0 \quad y \geq 0 \quad y \leq 3 - x$

$M:$




$M$ je om. (vejde se $B(0,4)$) ($B_4(0)$)

$M$ je uz.

$M$ uz: $\quad M_1 = \{[x,y] : x \geq 0\}$ $\quad g_1(x,y) = x \quad M_1 = g_1^{-1}(\underbrace{[0,\infty)}_{I_1})$

$M = M_1 \cap M_2 \cap M_3$ průnik uz je $\boxed{\text{uz.}}$

$M_2 = \{ y \geq 0\}$ $\quad g_2(x,y) = y \quad M_2 = g_2^{-1}(\underbrace{[0,\infty)}_{I_2})$

$M_3 = \{ : y \leq 3 - x\}$ $\quad g_3 = y + x \quad M_3 = g_3^{-1}(\underbrace{(-\infty,3]}_{I_3})$

$\left.\begin{array}{l} g_1, g_2, g_3 \text{ spoj.} \\ I_1, I_2, I_3 \text{ uz} \end{array}\right\} \rightarrow M_1, M_2, M_3$ uz.

uz + om ($v\ \mathbb{R}^4$) $\Rightarrow$ $\boxed{M \text{ kpt}}$

$\left.\begin{array}{l} f(x,y) = x^2 - 2y^2 + 4xy - 6x - 1 \\ f \text{ je spoj. (polynom)} \end{array}\right\}$ $f$ na $M$ nabývá extrémů :)

- $\inf M$ $(M^\circ)$

$$\frac{\partial f}{\partial x} = 2x + 4y - 6$$

$$\frac{\partial f}{\partial y} = -4y + 4x$$

$$\begin{aligned} 2x + 4y - 6 &= 0 \\ -4y + 4x &= 0 \\ \hline 6x &= 6 \end{aligned}$$

$$\boxed{y = 1} \leftarrow \boxed{x = 1}$$

$A_1 = [1,1]$

-

$y = 0 \quad x \in (0,3)$ $\qquad y = 3 - x \quad x \in (0,3)$

$x = 0 \quad y \in (0,3)$

$x^2 - 2y^2 + 4xy - 6x - 1$

$f(x,0) = x^2 - 6x - 1 =: h_1(x)$ $\qquad$ mimo

$h_1' = 2x - 6 \qquad 2x - 6 = 0 \qquad \boxed{x = 3}$

$f(0,y) = -2y^2 - 1 =: h_2(y)$ $\qquad$ mimo interval

$h_2'(y) = -4y \qquad -4y = 0 \qquad \boxed{y = 0}$

$f(x, 3-x) = x^2 - 2(3-x)^2 + 4x(3-x) - 6x - 1$

$= -5x^2 + 18x - 19 =: h_3(x)$

$h_3' = -10x + 18 \qquad -10x = -18$

$\boxed{x = \frac{9}{5}}$ je na

$y = 3 - \frac{9}{5} \rightarrow$

$\boxed{y = \frac{6}{5}}$

- podezřelé body

$[1,1]$ $\qquad [9/5, 6/5]$

- rohy $\quad [0,0] \quad [3,0] \quad [0,3]$

$f(1,1) = -\cancel{10}\ 4$

$f(0,0) = -1$ $\qquad$ f má glob. max $f(0,0) = -1$

$f(3,0) = -10$

$f(0,3) = -19$ $\qquad$ glob. min $f(0,3) = -19$

$f(9/5, 6/5) = -\frac{14}{5}$