

Lokální extrém 2 proměnných

$$f(x, y) = 7 + x^2 + xy - y^2 + 6x - 9y$$

$$I) \frac{\partial f}{\partial x} = 2x + y + 6 \longrightarrow I. \quad 2x + y + 6 = 0$$

$$\frac{\partial f}{\partial y} = x - 2y - 9 \cdot (-2) \longrightarrow II. \quad \underline{-2x + 4y + 18 = 0}$$

$$5y + 24 = 0$$

$$x = -\frac{3}{5} \longleftarrow y = -\frac{24}{5}$$

II) Vznik podezřelého bodu $[-\frac{3}{5}; -\frac{24}{5}]$

$$III) \frac{\partial^2 f}{\partial x^2} = 2 \quad \frac{\partial^2 f}{\partial y^2} = -2 \quad \frac{\partial^2 f}{\partial x \partial y} = 1 \quad \frac{\partial^2 f}{\partial y \partial x} = 1$$

$$IV) \text{Det} \left(-\frac{3}{5}; -\frac{24}{5} \right) = \begin{vmatrix} 2 & 1 \\ 1 & -2 \end{vmatrix} = -4 - 1 = -5 < 0$$

nemá extrém

V bodu $[-\frac{3}{5}, -\frac{24}{5}, -30]$ je sedlový bod.