

lok extr.

1e

$$f(x,y) = 2x^3 + 9xy^2 + 15x^2 + 27y^2$$

$$\frac{\partial f}{\partial x} = 6x^2 + 9y^2 + 30x$$

$$\frac{\partial f}{\partial y} = 18xy + 54y$$

$$6x^2 + 9y^2 + 30x = 0$$

$$18xy + 54y = 0$$

$$y \cdot 18(x + 3) = 0$$

$$y = 0$$

✓

$$x = -3$$

$$6x^2 + 30x = 0$$

$$6x(x + 5) = 0$$

$$x = 0 \quad x = -5$$

$$[0, 0], [-5, 0]$$

$$54 + 9y^2 - 90 = 0$$

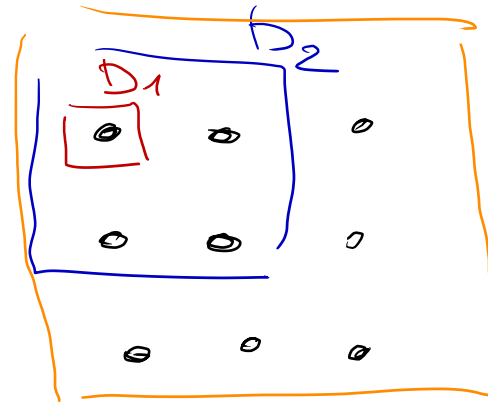
$$9y^2 - 36 = 0$$

$$y^2 = 4$$

$$y = \pm 2$$

$$[-3, 2], [-3, -2]$$

$$\begin{pmatrix} 2 \times 2 & 2 \times 4 \\ 12x + 30 & 18y \\ 2 \times 4 & 2 \times 2 \\ 18x & 18x + 54 \end{pmatrix}$$



$[0, 0]$

$$\begin{vmatrix} 30 & 0 \\ 0 & 54 \end{vmatrix}$$

$$D_1 = 30 > 0$$

pos.

$$D_2 = 30 \cdot 54 > 0$$

definitiv

→ loc. min.

$[-5, 0]$

$$\begin{vmatrix} -30 & 0 \\ 0 & -36 \end{vmatrix}$$

$$D_1 < 0$$

$$D_2 = +30 \cdot 36 > 0$$

neg. def.

→ loc. max

$[-3, 2]$

$$\begin{vmatrix} -6 & 36 \\ 36 & 0 \end{vmatrix}$$

$$D_1 = -6 < 0$$

indef.

$$D_2 = -36^2 < 0$$

→ nici extrem

$[-3, -2]$

$$\begin{vmatrix} -6 & -36 \\ -36 & 0 \end{vmatrix}$$

$$D_1 = -6 < 0$$

indef.

$$D_2 = -36^2 < 0$$

→ nici extr.