

MATH 202
ÉNONCÉS DES EXERCICES 5

A. ZEYTİN

(1) Trouver les points critiques, singulières et frontières de la fonction f et déterminer les points auxquelles f admet une valeur extrême globale sur D .

- ▶ $f(x, y) = x^2 + 2xy - y^2$, $D = \{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 1\}$
- ▶ $f(x, y) = \sqrt{x + 2y}$, $D = \{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 9\}$
- ▶ $f(x, y) = xy - y^2$, $D = \{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 1\}$
- ▶ $f(x, y) = 2xy + x^2$, $D = \{(x, y) \in \mathbb{R}^2 \mid -1 \leq x \leq 1, x - 1 \leq y - x + 1\}$
- ▶ $f(x, y) = x^2 + 2y - 5xy$, $D = \{(x, y) \in \mathbb{R}^2 \mid y = 1 - x, y = 1 + x, y = -1 - x, y = -1 + x\}$
- ▶ $f(x, y) = 3x^2 + y^2 - 3yx$, $D = \{(x, y) \in \mathbb{R}^2 \mid y = 3, y = x^2\}$
- ▶ $f(x, y) = x^2 - xy - y^2$, $D = \{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 4\}$
- ▶ $f(x, y) = x^2 y e^{-(x+y)}$, $D = \{(x, y) \in \mathbb{R}^2 \mid x \geq 0, y \geq 0, x + y \leq 5\}$
- ▶ $f(x, y) = xy$, $D = \{(x, y) \in \mathbb{R}^2 \mid \frac{x^2}{16} + y^2 \leq 1\}$
- ▶ $f(x, y) = x^3 - x + y^2 - xy$, $D = \{(x, y) \in \mathbb{R}^2 \mid x \geq 0, y \geq 0, x + y \leq 2\}$
- ▶ $f(x, y) = xy - x^3 y^2$, $D = \{(x, y) \in \mathbb{R}^2 \mid x \geq 0, y \geq 0, x + y \leq 2\}$
- ▶ $f(x, y) = \frac{x - y}{1 + x^2 + y^2}$, $D = \{(x, y) \in \mathbb{R}^2 \mid y \geq 0\}$
- ▶ $f(x, y) = 4x + 6y - x^2 - y^2$, $D = \{(x, y) \in \mathbb{R}^2 \mid 0 \leq x \leq 4, 0 \leq y \leq 5\}$