

$$f(x,y) = y e^{-x^2 y^2}$$

$$g(x,y) = y^2 x^2 - 1 = 0 \text{ vincolo}$$

De vincolo non ho pt. critici  
molti

$$\nabla g = (-2x, 2y) = 0 \Rightarrow (x,y) = (0,0)$$

che non soddisfa l'eq.

del vincolo

$$L(x,y) = f - \lambda g = y e^{-x^2 y^2} - \lambda (y^2 x^2 - 1)$$

$$\frac{\partial L}{\partial x} = -2xy e^{-x^2 y^2} + 2\lambda x \quad \left\{ \begin{array}{l} 2x(\lambda - y e^{-x^2 y^2}) = 0 \\ 2y(\lambda + y e^{-x^2 y^2}) - e^{-x^2 y^2} = 0 \\ y^2 x^2 - 1 = 0 \quad \Rightarrow y \neq 0 \end{array} \right.$$

$$\frac{\partial L}{\partial y} = -2y^2 e^{-x^2 y^2} + e^{-x^2 y^2} - 2\lambda y$$

$$\frac{\partial L}{\partial \lambda} = -(y^2 x^2 - 1)$$

$$\left\{ \begin{array}{l} x=0 \\ 2y(\lambda + y e^{-y^2}) = e^{-y^2} \\ y^2 = \pm 1 \end{array} \right. \quad \left\{ \begin{array}{l} x=0 \\ y=1 \\ 2(\lambda + e^{-1}) = e^{-1} \\ \lambda = -e^{-1}/2 \end{array} \right. \Rightarrow (0,1)$$

$$\left\{ \begin{array}{l} x=0 \\ y=-1 \\ -2(\lambda - e^{-1}) = e^{-1} \\ \lambda = e^{-1}/2 \end{array} \right. \Rightarrow (0,-1)$$

$$\lambda = y e^{-x^2 y^2}$$

$$2y(y e^{-x^2 y^2} + y e^{-x^2 y^2}) = e^{-x^2 y^2} \Rightarrow 4y^2 = 1 \Rightarrow y = \pm \frac{1}{2}$$

$$\frac{1}{4} - 1 = x^2 \quad x^2 = -3/4 \text{ impossibile} \Rightarrow$$

$P_1(0,-1)$   $P_2(0,1)$  sono gli estremi.