BY GIMUSI 01/07/15

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

PUNTI STAZIONARI

$$\begin{cases} f_x = y e^{xy} - y = 0 \\ f_y = x e^{xy} - x = 0 \end{cases} \quad \begin{cases} y(e^{xy}-1) = 0 \\ x(e^{xy}-1) = 0 \end{cases} \quad \begin{cases} x = y = 0 & \rightsquigarrow P_0(0,0) \\ y = 0, x \neq 0 & \rightsquigarrow P_1(x,0) \\ x = 0, y \neq 0 & \rightsquigarrow P_2(0,y) \end{cases}$$

NATURA PUNTI STAZIONARI

$f_{xx} = y^2 e^{xy} \qquad f_{xy} = e^{xy} + xy e^{xy} - 1 \qquad f_{yy} = x^2 e^{xy}$

$$H_f(P_0) = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix} \quad ?$$

$$H_f(P_1) = \begin{pmatrix} 0 & 0 \\ 0 & x^2 \end{pmatrix} \quad x \neq 0 \rightsquigarrow \text{SEMIDEF. POSITIVA} \quad ?$$

$$H_f(P_2) = \begin{pmatrix} 0 & 0 \\ 0 & y^2 \end{pmatrix} \quad y \neq 0 \rightsquigarrow \text{SEMIDEF. POSITIVA} \quad ?$$

STUDIO CON TAYLOR

$$P_0 = (0,0) \rightsquigarrow f(x,y) = 1 + \cancel{xy} + x^2y^2 + o(x^2y^2) - \cancel{xy} =$$
$$= 1 + x^2y^2 + o(x^2y^2)$$

$$\rightsquigarrow \exists B_R(0,0) : f(P) \geq f(P_0) \quad \forall P \in B_R(0,0)$$

$\rightsquigarrow$ $P_0$ E UN PUNTO DI MINIMO RELATIVO

$P_1 = (\bar{x}, 0) \rightsquigarrow f(x,y) = ?$

$P_2 = (0, \bar{y}) \rightsquigarrow f(x,y) = ?$