Esercizio 3

October 29, 2016

Trovo il polinomio di Tailor della funzione e^{x+y^2} nel punto (1, 1).
$f(1,1) = e^2$
$gradf = (e^{x+y^2}, 2ye^{x+y^2})$
$gradf(1,1) = (e^2, 2e^2)$

$$Hf = \begin{pmatrix} e^{x+y^2} & 2ye^{x+y^2} \\ 2ye^{x+y^2} & 2e^{x+y^2} + 4y^2e^{x+y^2} \end{pmatrix}$$

$$Hf(1,1) = \begin{pmatrix} e^2 & 2e^2 \\ 2e^2 & 6e^2 \end{pmatrix}$$

$$f(x,y) = e^2 + e^2(x-1) + 2e^2(y-1) + \frac{1}{2}\begin{pmatrix} e^2(x-1) + 2e^2(y-1) \\ 2e^2(x-1) + 6e^2(y-1) \end{pmatrix}\begin{pmatrix} x-1 \\ y-1 \end{pmatrix} + r =$$

$$= e^2 + e^2(x+2y-3) + \tfrac{1}{2}e^2(x+2y-3)(x-1) + \tfrac{1}{2}e^2(2x+6y-8)(y-1) + r$$

con:
$lim_{(x,y)\to(1,1)} \frac{r}{\sqrt[2]{(x-1)^2+(y-1)^2}} = 0$