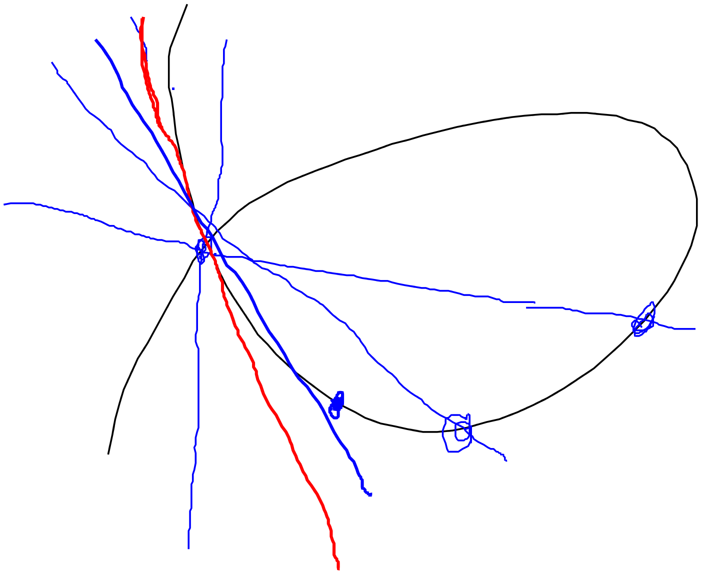

$$\left(\frac{\partial}{\partial x}+\frac{\partial}{\partial y}\right)^{s} f(x_0, y_0)$$

$$\frac{\partial^{s} f(x_0, y_0)}{\partial x^{s}} + \binom{s}{1}\frac{\partial^{s} f(x_0, y_0)}{\partial x^{s-1}\,\partial y} +$$

$$\cdots + \frac{\partial^{s} f(x_0, y_0)}{\partial y^{s}}$$

$$f(x,y) = \cancel{f(x_0,y_0)} = 0$$

$$+ \left((x-x_0)\frac{\partial}{\partial x} + (y-y_0)\frac{\partial}{\partial y}\right) f(x_0,y_0)$$

$$+ \dots$$

$$+ \frac{1}{(s-1)!}\left((x-x_0)\frac{\partial}{\partial x} + (y-y_0)\frac{\partial}{\partial y}\right)^{s-1} f(x_0,y_0)$$

$$+ \frac{1}{s!}\left((x-x_0)\frac{\partial}{\partial x} + (y-y_0)\frac{\partial}{\partial y}\right)^{s} f(x_0,y_0)$$

$$+ \dots$$

$$\begin{cases} f(x,y) = 0 \\ (y-y_0) = k(x-x_0) \end{cases}$$

α β

$$\begin{cases} (y-y_0) = k(x-x_0) \\ 0 = (x-x_0)\left(\frac{\partial}{\partial x} + k\frac{\partial}{\partial y}\right) f(x_0,y_0) + \\ \quad + \dots \\ \quad + \frac{1}{(s-1)!}(x-x_0)^{s-1}\left(\frac{\partial}{\partial x} + k\frac{\partial}{\partial y}\right)^{s-1} f(x_0,y_0) + \\ \quad + \frac{1}{s!}(x-x_0)^{s}\left(\frac{\partial}{\partial x} + k\frac{\partial}{\partial y}\right)^{s} f(x_0,y_0) + \\ \quad + \dots \end{cases}$$

k coeff. ang. di una

tang. nel punto

$\iff k$ soddisfa

$$\left(\frac{\partial}{\partial x} + k\frac{\partial}{\partial y}\right)^{s} f(x_0, y_0) = 0$$

$$(y - y_0) = k(x - x_0)$$

$$\alpha(y - y_0) = \beta(x - x_0)$$

$$\left(\alpha\frac{\partial}{\partial x} + \beta\frac{\partial}{\partial y}\right)^{s} f(x_0, y_0) = 0$$

Caso $s = 2$

$$\alpha^2 \frac{\partial^2 f(x_0, y_0)}{\partial x^2} + 2\cancel{k}\,2\alpha\beta \frac{\partial^2 f(x_0, y_0)}{\partial x \partial y} + \cancel{k^2}\,\beta^2 \frac{\partial^2 f(x_0, y_0)}{\partial y^2} = 0$$

$$= 0$$

$$\alpha\left(\alpha \frac{\partial^2}{} + 2\beta \frac{\partial^2}{}\right) = 0$$

22/7/'09 es 1a

$e: \; x^4 - y^4 + xy = 0$

$f(x,y) =$

trovare pti mult e tang

$f_x = 4x^3 + y$ $\qquad f_{xx} = 12x^2 \quad 0$

$f_y = -4y^3 + x$ $\qquad f_{xy} = 1 \quad 1$

$\qquad f_{yy} = -12y^2 \quad 0$

$$\begin{cases} f = 0 \\ f_x = 0 \\ f_y = 0 \end{cases} \qquad \begin{cases} 256y^{12} - y^4 + 4y^4 = 0 \\ f_x = 0 \\ x = 4y^3 \end{cases}$$

$$y^4 (\underline{256y^8 + 3}) = 0$$

$$\begin{cases} y = 0 \\ x = 0 \\ x = 0 \end{cases} \qquad (0,0)$$

$0 + 1k + 0k^2 = 0 \quad \begin{cases} k = 0 \\ k = \infty \end{cases}$

$0\alpha^2 + 1\alpha\beta + 0\beta^2 = 0$

$\alpha\beta = 0$

$\alpha x = \beta y$

Asintoti di e:

$$x^4 - y^4 + xy = 0$$

$$X_1^4 - X_2^4 + X_1 X_2 X_0^2 = 0$$

$F(X_0, X_1, X_2) =$

	P'_∞	P''_∞
$F_0 = 2X_0X_1X_2$	0	0
$F_1 = 4X_1^3 + X_2X_0^2$	4	4
$F_2 = -4X_2^3 + X_1X_0^2$	-4	4

$$\begin{cases} X_1^4 - X_2^4 + \cancel{X_1X_2X_0^2} = 0 \\ X_0 = 0 \end{cases}$$

$$\begin{cases} X_1^4 - X_2^4 = 0 \quad (X_1^2 + X_2^2)(X_1^2 - X_2^2) = 0 \\ X_0 = 0 \end{cases}$$

$$\begin{cases} X_1 = \pm X_2 \\ X_0 = 0 \end{cases} \qquad \begin{aligned} P'_\infty &= (0, 1, 1) \\ P''_\infty &= (0, 1, -1) \end{aligned}$$

tang. in P'_∞:

$$0X_0 + 4X_1 - 4X_2 = 0$$

$$4x - 4y = 0$$

tang. in P''_∞:

$$0X_0 + 4X_1 + 4X_2 = 0$$

$$4x + 4y = 0$$