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$$p(x_k, y_k) + (y - y_k)^0 p(x_k, y_k) + (x - x_k)^1 p'_x(x_k, y_k) + (y - y_k) p'_y(x_k, y_k) = 0$$

$$p(x_k, y_k) + p(x_k, y_k) + p'_x(x_k, y_k)(x - x_k) + p'_y(x_k, y_k)(y - y_k) = 0$$

$$p'_x(x_k, y_k)(x - x_k) + p'_y(x_k, y_k)(y - y_k) = -p(x_k, y_k)$$

$$\begin{bmatrix} p'_x & p'_y \\ g'_x & g'_y \end{bmatrix} \begin{bmatrix} x_{k+1} - x_k \\ y_{k+1} - y_k \end{bmatrix} = -\begin{bmatrix} p(x_k, y_k) \\ g(x_k, y_k) \end{bmatrix}$$

Repetir com $g(x, y)$

Exercício 2:

Aplicar M. Newton com $\begin{bmatrix} x_0 \\ y_0 \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$

obs: 2 iterações

$$\begin{cases} x^3 - 2xy + 3 = 0 \\ \sqrt{xy} - 2 = 0 \end{cases}$$

$$\begin{bmatrix} 1 & -2 \\ 1/2 & 1/2 \end{bmatrix} \begin{bmatrix} x_1 - 1 \\ y_1 - 1 \end{bmatrix} = -\begin{bmatrix} 2 \\ -1 \end{bmatrix}$$

$$\begin{cases} x_1 - 1 - 2y_1 + 2 = -2 \\ \frac{1}{2}x_1 - \frac{1}{2} + \frac{1}{2}y_1 - \frac{1}{2} = 1 \end{cases} \rightarrow \begin{cases} x_1 - 2y_1 = -3 \\ \frac{1}{2}x_1 + \frac{1}{2}y_1 = 2 \end{cases}$$

$$\begin{cases} x_1 - 2y_1 = -3 \\ x_1 + y_1 = 4 \end{cases}$$

$$\boxed{\begin{aligned} x_1 &= 5/3 \\ y_1 &= 7/3 \end{aligned}}$$

$$\begin{bmatrix} \frac{11}{3} & -\frac{10}{3} \\ \frac{\sqrt{7}}{2\sqrt{5}} & \frac{\sqrt{5}}{2\sqrt{7}} \end{bmatrix} \begin{bmatrix} x_2 - 5/3 \\ y_2 - 7/3 \end{bmatrix} = \begin{bmatrix} \frac{125}{27} - \frac{70}{9} + 3 \\ \sqrt{\frac{35}{9}} - 2 \end{bmatrix}$$

CONTINUANDO OS CALCULOS CHEGAMOS EM x_2 , y_2