

$$\begin{pmatrix} x_1 \\ y_1 \end{pmatrix} = \begin{pmatrix} x_0 \\ y_0 \end{pmatrix} - \begin{pmatrix} \left(\frac{\partial f}{\partial x}\right)_y & \left(\frac{\partial f}{\partial y}\right)_x \\ \left(\frac{\partial g}{\partial x}\right)_y & \left(\frac{\partial g}{\partial y}\right)_x \end{pmatrix}^{-1} \begin{pmatrix} f(x_0) \\ g(y_0) \end{pmatrix}$$