

Deriving Implicit from Inverse

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Given $f(a, b) = 0$ solve $f(x, y) = 0$ can solve $g(x) - y = 0$

$$f(x, y) - f(x, b) = -f(x, b)$$

$$x = x_0$$

$$f(x, y) = 0$$

$$x = x_0$$

$$G \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} x \\ f(x, y) \end{pmatrix}$$

solve $G \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} x_0 \\ 0 \end{pmatrix}$ near $G \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} a \\ 0 \end{pmatrix}$

$$DG = \begin{pmatrix} I & 0 \\ \frac{\partial f}{\partial x} & \frac{\partial f}{\partial y} \end{pmatrix}$$