Homework 11 of Introduction to Analysis(II)

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1.

2. Assume $f \in C^1(\mathbb{R}^2, \mathbb{R})$ and f is one-to-one, $Df(x_0, y_0) \neq 0$ for some x_0, y_0 (or f is constant function and not one-to-one).

   Then, suppose $\dfrac{\partial f}{\partial x}(x_0, y_0) \neq 0$, by Implicit Function Theorem, there is a neighborhood $U \subseteq \mathbb{R}^2$ and $W \subseteq \mathbb{R}$ s.t. $(x_0, y_0) \in U$ and $y_0 \in W$.