

Math 366, Winter '03
Homework 3

From Rudin. pp 239-241: 9, 14abd, 16, 17

Profs Personal Problems:

1. Consider the mapping $f : \mathbf{R}^2 \rightarrow \mathbf{R}^2$ given by

$$f(x, y) = (\sin x - \cos y, e^x + e^y).$$

Note that $f(0, 0) = (-1, 2)$.

- Show that f is locally invertible near $(0, 0)$ and give a linear approximation for f^{-1} .
- Find, to three decimal places of accuracy a point (x, y) near $(0, 0)$ such that $f(x, y) = (-1.02, 1.97)$. (Show all intermediate approximations to (x, y) and at least enough work to explain how you're getting them.)