

Math 518 Differentiable Manifolds I

Assignment 1, Due Tuesday September 14

1. Consider the map $F: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ defined by

$$F(x, y) = (\sin(x + y), x^2 - y^2).$$

Find the points at which F is a local diffeomorphism.

2. Construct a smooth atlas on the unit square

$$\{(x_1, x_2) \in \mathbb{R}^2 \mid \max\{|x_1|, |x_2|\} = 1\}.$$

Problems from the text: 1-1, 1-4, 1-5, and 1-7.