Mathematics W4081y
Differentiable Manifolds

Assignment #3
Due February 17, 2014

In Spivak, do the following problems.

1–10, **2–1**, **2–4**, **2–6**, **2–7**, **2–11**, **2–13**, **2–16**.

Notes: In **2–4**, the function g need not be continuous (which we haven't yet defined for functions on the unit circle anyway).

Spivak's notation differs somewhat from ours. He denotes the partial derivative $\partial f/\partial x_i$ by $D_i f$ and the total derivative $D_a f$ by $Df(a)$. He uses a distinct notation for the Jacobian matrix, denoting it by $f'(a)$. According to our convention, linear maps $\mathbf{R}^n \to \mathbf{R}^m$ are identified with matrices in $M_{m \times n}$, so the Jacobian of a differentiable $f : \mathbf{R}^n \to \mathbf{R}^m$ is identified with the total derivative $D_a f$.