Due: Wednesday, March 24

HMC Math 143 Spring 2004
Prof. Gu
Problem Set 6

Start this assignment before Sunday night!

Read:

- Handout on Riemannian Manifolds.
- Riemannian Geometry by Do Carmo, Chapter 1
- Lecture Notes.

Do:

A: Problems on Reviewing The Differential of a (Differentiable) Map.
   - a) Write in your own words for a proof of Proposition 5.4 on page 28, Do Carmo.

B: Problems from Lectures
   - a) Show that $O(n)$ is a Lie group and it is disconnected.
   - b) Show that $SO(n)$ is a Lie group and it is connected.
   - c) Show that $E(n)$ is a Lie group. True or False: $E(n) \cong SO(n) \times R^n$. Why?

C: Other Problems
   - a) Problem 1, page 45, Riemannian Geometry, Do Carmo.
   - b) Problem 2, page 46, Riemannian Geometry, Do Carmo.
   - c) Problem 4, page 46, Riemannian Geometry, Do Carmo.
   - d) Problem 5, page 46, Riemannian Geometry, Do Carmo.
   - e) Problem 6, page 46, Riemannian Geometry, Do Carmo.
   - f) Problem 7, page 46, Riemannian Geometry, Do Carmo.