MA 562 - Differential Topology
Quiz 1 Study Guide

Quiz 1 is scheduled for Friday, September 6 in class at 8:30am. It will be 20 minutes long. *Do not be late for class.*

The following is a list of problems you should practice and understand how to solve before the quiz.

1. Let M be a topological space that is locally Euclidean of dimension n. Recall that an atlas is any set $\mathcal{A} = \{(U_\lambda, \phi_\lambda)\}_{\lambda \in \Lambda}$ (where Λ is some index set) of coordinate charts $\phi_\lambda : U_\lambda \to \phi_\lambda(U_\lambda) \subseteq \mathbb{R}^n$ on M such that $\bigcup_{\lambda \in \Lambda} U_\lambda = M$. Show that there exists a unique maximal atlas on M. (Note: this problem has nothing to do with smoothness.)

2. Problem 1-8 on page 31 of Lee.

3. Let $F : M \to N$ be a diffeomorphism and let $O \subseteq M$ be an open submanifold. Show that $F|_O : O \to F(O)$ is a diffeomorphism.

4. Problem 3-2 on page 75 of Lee.

5. Exercise 3.17 on page 65 of Lee.