

**Math 518: HW 4 due Wednesday, September 24, 2014.**

1. Problem 4-6 of Lee on page 96.
2. Suppose  $F: S \rightarrow M$  is an injective immersion. Prove that if either of the following holds, then  $F$  is a smooth embedding and that moreover  $F(S)$  is closed.
  - (a)  $S$  is compact.
  - (b)  $F$  is proper, i.e. the preimage of every compact set is compact.

This problem was corrected on September 18.

3. Problem 5-11 of Lee on page 123.
4. Problem 5-19 of Lee on page 124. Hint: Read Lee pages 108-114.
5. Problem 3-4 of Lee on page 75.
6. Problem 8-11 of Lee on page 201.