

**Math 546**  
**Spring 2019**  
**Homework 3**

Finish reading Chapter 12 and read Chapter 13 of the text. Do Problems 13-5, 13-6, 13-21, 13-24 (you needn't prove that  $M_{[a,b]}$  is a regular domain), and the following supplementary exercise.

Supplementary Exercise: Let  $(M, g)$  be a Riemannian manifold and  $S \subset M$  a regular level set of the smooth function  $\Phi : M \rightarrow \mathbb{R}^k$ . Prove that the normal bundle of  $S$  in  $M$  is smoothly isomorphic to the trivial vector bundle  $S \times \mathbb{R}^k$  over  $S$ .