Math 7210: Riemannian Geometry – Homework 4
Due in class: Wednesday, February 8, 2017

1. Exercise #2.2 of do Carmo's *Riemannian Geometry*. (This explains how a connection can be obtained from a concept of parallelism.)

2. Exercise #2.3 of do Carmo's *Riemannian Geometry*. (This explains how the Riemannian connection ∇ associated to the induced Riemannian metric on a submanifold, relates to the Riemannian connection $\overline{\nabla}$ on the ambient manifold. In particular, it justifies the claim I made in class that the connection ∇ on the submanifold is basically obtained by applying the connection $\overline{\nabla}$ in the ambient manifold and then orthgonally projecting to the tangent bundle of the submanifold.)

3. Exercise #2.6 of do Carmo's *Riemannian Geometry*.

4. Exercise #2.8 of do Carmo's *Riemannian Geometry*, parts (a) and (b).

I also recommend that you think about exercises #2.4 and #2.5 if you have time.