

Math 341 Quiz topics for Week 11

- Suppose  $U, V$  open subsets of a manifold  $M$ , and  $M = U \cup V$ . What is the Mayer-Vietoris sequence for  $U, V, M$ ?
- Show how to use the Mayer-Vietoris sequence to compute  $H^1 S^1$  where  $S^1$  is the 1-sphere (a circle).
- What does it mean to say  $f: M \rightarrow N$  is *null-homotopic*, and what can we then conclude about the cohomology of  $M$  and  $N$ ?
- What does it mean to say  $M$  is *contractible*, and what can we then conclude about the homology of  $M$ ? Give a concrete example of a contractible space.
- Give, with proof, an example of a manifold that is not contractible.