

Math 8301, Manifolds and Topology
Homework 9
Due in-class on **Friday, November 16**

Part of the power of algebraic topology is in being able to actually compute things.

Here is a list of topological spaces, each of which can be triangulated. For each of these topological spaces, give a simplicial complex which realizes it, and compute—directly, without any fancy machinery that we haven't covered—the associated homology groups.

1. The complete graph on 4 vertices.
2. The 2-sphere S^2 . (Triangulated as the boundary of a tetrahedron.)
3. The torus $S^1 \times S^1$. (Triangulated however you like.)
4. $\mathbb{R}P^2$. (Triangulated as in a previous assignment.)
5. The Klein bottle.