

MAT8021, Algebraic Topology

Assignment 1

Due in-class on Friday, February 24

Numbered exercises are from Lee's "Introduction to topological manifolds," second edition.

1. Exercise 5.3.
2. Problem 5-5.
3. Given positive integers v , e , and f satisfying $v - e + f = 2$, construct a cell structure on \mathbb{S}^2 having v 0-cells, e 1-cells, and f 2-cells.
4. Enumerate all the subcomplexes of \mathbb{S}^∞ , with the cell structure on \mathbb{S}^∞ that has \mathbb{S}^n as its n -skeleton.
5. Show that the mapping cylinder of every map $f : \mathbb{S}^1 \rightarrow \mathbb{S}^1$ is a CW complex.