547 - Spring 2018 - HW6

March 4, 2018

1. Use Mayer-Vietoris to compute the homology of $\mathbb{CP}^2$.

2. Prove that if (X, A) is a good pair and A is contractible, then $\mathrm{H}_*(X, A, \mathbb{Z}) \cong \tilde{\mathrm{H}}_*(X, \mathbb{Z})$.

3. Let X be a space and $x \in X$ a point which is a deformation retract of some open neighborhood of X. Compute $\mathrm{H}_*(X - \{x\}, \mathbb{Z})$.

4. Hatcher, Exercise 2.1.16.

5. Hatcher, Exercise 2.1.17.

6. Hatcher, Exercise 2.1.20.

7. Hatcher, Exercise 2.1.29.

8. Compute the integral homology of $\mathbb{RP}^n$ for all $n \geqslant 2$.

9. Attach a 2-cell to S^1 along the multiplication-by-n map $S^1 \xrightarrow{n} S^1$. Compute the integral homology of the resulting space.