

Math 751
Equivariant Homotopy and Cohomology
Homework 3
Fall 2020

1. (Worksheet 8, Problem 3)

- (a) Writing $P_*^{C_k}$ for the free resolution of \mathbb{Z} over C_k , build a comparison of resolutions $P_*^{C_3} \rightarrow \downarrow_{C_3}^{C_6} P_*^{C_6}$ in degrees 0, 1, and 2.
- (b) Use your comparison in (a) to describe the map $H^2(C_6) \rightarrow H^2(C_3)$ and the resulting ring homomorphism $H^*(C_6) \rightarrow H^*(C_3)$.
- (c) Writing $p: C_6 \rightarrow C_2$ for the quotient, build a comparison of resolutions $P_*^{C_6} \rightarrow p^* P_*^{C_2}$ in degrees 0, 1, and 2.
- (d) Use your comparison in (c) to describe the map $H^2(C_2) \rightarrow H^2(C_6)$ and the resulting ring homomorphism $H^*(C_2) \rightarrow H^*(C_6)$.

2. Please write up the solution for another problem of your choice from one of the worksheets.