

Homework 6

Due: Mar 20

1. Hatcher 2.1.7 (p.131)
2. Hatcher 2.1.9 (p.131)
3. Hatcher 2.1.11 (p.132)
4. Hatcher 2.1.12 (p.132)
5. Let A and B be chain complexes. A chain map $f : A \rightarrow B$ is called a chain homotopy equivalence if there exists a chain map $g : B \rightarrow A$ such that $f \circ g$ and id_B are chain homotopic, and $g \circ f$ and id_A are chain homotopic.
 - (a) Prove that if $f : A \rightarrow B$ is a chain homotopy equivalence, then f induces an isomorphism on homology.
 - (b) Give an example of chain complexes A and B with isomorphic homology but no chain homotopy equivalence between them. (Hint: Let A be \mathbb{Z} in two consecutive gradings and zero everywhere else.)