

HOMEWORK 4

Exercise 1. Derive the long exact sequence for the triple $A \subseteq B \subseteq X$.

Exercise 2. Using the long exact sequence of a triple, prove that

$$H_1([-1, 1], \{-1, 1\}) \cong H_0(\{-1, 1\}, \{-1\}).$$

Then show

$$H_0(\{-1, 1\}, \{-1\}) \cong \mathbb{Z}$$

and find a cycle $c \in C_0(\{-1, 1\}, \{-1\})$ which represents a generator of $H_0(\{-1, 1\}, \{-1\})$. Using this show that the singular simplex

$$\text{id} : \Delta^1 \rightarrow \Delta^1$$

represents a generator of $H_1(\Delta^1, \partial\Delta^1) \cong \mathbb{Z}$.