

Math 215a Homework #4, Due Thursday 10/27 at 9:40 AM

1. Hatcher section 2.1, problems 14, 17(b), 18, 27.
2. Hatcher, section 2.2, problem 2.
3. If $\sigma : \Delta_n \rightarrow X$, define $\bar{\sigma} : \Delta_n \rightarrow X$ by

$$\bar{\sigma}(t_0, \dots, t_n) := \sigma(t_n, \dots, t_0).$$

Define a map $T : C_n(X) \rightarrow C_n(X)$ by $T(\sigma) := (-1)^{n(n+1)/2} \bar{\sigma}$.

- (a) Show that T is a chain map.
 - (b) Show (without constructing it explicitly) that there exists a chain homotopy from T to the identity.
4. How difficult was this assignment? (1 = very easy, 5 = very hard)