

**Reading:** Hatcher §3.1 and beginning of 3.2.

**Exercise 1.** Give an explicit singular cocycle which represents the generator for  $H^1(S^1, \mathbb{Z})$ . Do similarly for  $H^n(S^n, \mathbb{Z})$ .

**Exercise 2.** Hatcher, Section 2.2 Exercises 14, 15, 19.

**Exercise 3.** Hatcher, Section 3.1 Exercises 1, 3, 6.

**Exercise 4.** Using the cup product, show that every map  $S^2 \rightarrow T^2$  has degree zero.