Homework 11
Due: May 2

1. Compute the homology groups of $T^3 = S^1 \times S^1 \times S^1$, $T^2 \times \mathbb{RP}^2$ and $\mathbb{RP}^m \times \mathbb{RP}^n$.

2. (a) Universal coefficient theorem for homology: Let $X$ be a topological space. For any abelian group $G$ the singular chain complex with coefficients in $G$, $C_*(X; G)$, is obtained from the singular chain complex of $X$ by tensoring with the chain complex $0 \to G \to 0$.

   Use the Künneth formula to compute $H_i(X; G)$ in terms of $H_i(X)$ and $G$.

   (b) Find the homology and cohomology groups of $\mathbb{RP}^m \times \mathbb{RP}^n$ with $\mathbb{Z}_2$ coefficients.

3. Hatcher 3.1.5 (p. 205)
4. Hatcher 3.1.6 (p. 205)
5. Hatcher 3.1.8 parts (a) and (c) (p. 205)
6. Hatcher 3.1.9 (p. 205)