Homework 9:

1) Show that the identity map $\iota_n : \Delta_n \to \Delta_n$ gives a generator of $H_n(\Delta_n, \partial\Delta_n) = \mathbb{Z}$.

2) Hatcher, page 158, problem 30.

3) Show that if $p : E \to B$ is an n-sheeted covering of a finite CW complex B, then $\chi(E) = n\chi(B)$. Conclude that if $f : \mathbb{R}P^{2n} \to B$ is a covering map with B a finite CW-complex, then f is a homeomorphism.

4) Suppose $X = A \cup B$ is a finite CW-complex and A and B are CW-subcomplexes. Show $\chi(A \cup B) = \chi(A) + \chi(B) - \chi(A \cap B)$.

5) Hatcher page 159, problem 43.

6) Hatcher page 165, problem 1.