Introduction to Topology – Homework 5

1. Compute the homology with integer coefficients of the 2-dimensional sphere.
2. Compute the homology with integer coefficients of the wedge of finitely many circles.
3. Compute the homology with integer coefficients of the torus with one puncture.
4. Find a space X such that $H_1(X)$ is $\mathbb{Z}_3$.
5. Compute the homology with real coefficients of the 2-dimensional sphere and of the projective plane.
6. Compute the homology with real coefficients of the Klein bottle. What is its Euler characteristic?
7. Compute the homology with real coefficients of the genus g surface.
8. Compute the homology with $\mathbb{Z}_2$ coefficients of the n-dimensional sphere.