MATH 611 (DUE 10/23)

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1. Simplicial and Singular Homology

Exercise. (Problem 2) Show that the Δ-complex obtained from Δ^3 by performing the edge identifications $[v_0, v_1] \sim [v_1, v_3]$ and $[v_0, v_2] \sim [v_2, v_3]$ deformation retracts onto a Klein bottle. Find other pairs of identifications of edges that produce Δ-complexes deformation retracting onto a torus, a 2-sphere, and $\mathbb{R}\mathbf{P}^2$.

Proof. Maybe something like this? Either way, I noticed that it looks like it contains 2 $\mathbb{R}\mathbf{P}^2$. □

Exercise. (Problem 4) Compute the simplicial homology groups of the triangular parachute obtained from Δ^2 by identifying its three vertices to a single point.

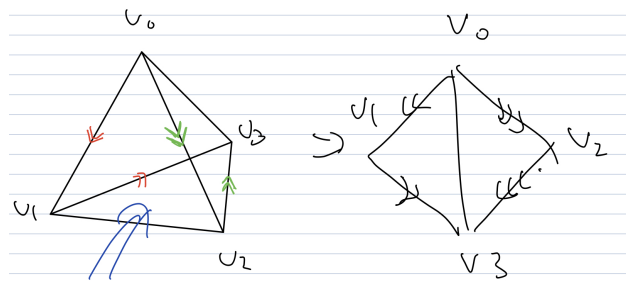*Proof.* Do I need to do the "no-edge-can-have-the-same-vertices" thing? □

FIGURE 1. mycaption