

### HOMEWORK 3 – 2017

**Example 1.** Compute the simplicial homology groups of the Klein bottle. Use the following model of the Klein bottle as a  $\Delta$ -complex:

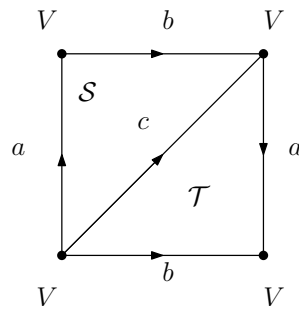


FIGURE 1. Model of the Klein bottle

**Example 2.** Compute the homology groups of the projective plane. Use the following model:

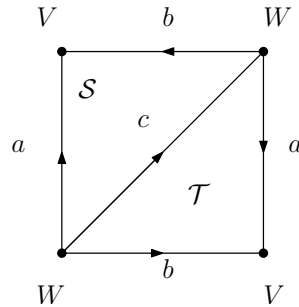


FIGURE 2. Model of the real projective plane

**Example 3.** We have defined the unreduced suspension of a space  $X$  as

$$SX = X \times I / \sim,$$

where  $(x_1, 0) \sim (x_2, 0)$ ,  $(x_1, 1) \sim (x_2, 1)$ , and the reduced suspension as

$$\Sigma X = SX / (\{x_0\} \times I).$$

Prove that  $\Sigma X = (X, x_0) \wedge (S^1, s_0)$ .