Name: _____ Score (Out of 4 points):

1. (4 points) The *closed nonorientable surface N_g of genus g* is the connected sum of g copies of $\mathbb{R}\mathrm{P}^2$,

$$N_g = \mathbb{R}\mathrm{P}^2 \# \mathbb{R}\mathrm{P}^2 \# \cdots \# \mathbb{R}\mathrm{P}^2.$$

It has a CW complex structure as follows [which you do not need to verify]:

- 1 zero-cell x
- g one-cells $a_1, a_2, \ldots, a_g$
- 1 two-cell D attached along the word $a_1^2 a_2^2 a_3^2 \cdots a_g^2$.

Compute the cellular homology groups of N_g.