

**Homework exercises Algebraic topology, hand in before class on  
17-10-2018**

Exercise 1.

Make every step in the computation of the homology of spheres from chapter 3 of the lecture notes explicit by giving chains that represent generators for each of the spaces written there. You only have to do this for  $H_0(S^0)$  and  $H_1(S^1)$  and the (pairs of) spaces used to compute those. Use your explicit generators to compute the degree of the map  $S^1 \ni z \mapsto z^n \in S^1$ , where we identified  $\mathbb{R}^2$  with the complex plane. Throughout you may work with coefficient group  $A = \mathbb{Z}$ .

Exercise 2.

State and prove the two out of three property mentioned in the proof of the excision theorem in the lecture notes.