

## HOMEWORK 4 – 2020

**Exercise 1.** Using the Mayer-Vietoris exact sequence compute the homology groups of the sphere with two handles.

**Exercise 2.** Consider a surface which consists of the disk to which the Moebius band is attached in such a way that we stick the boundary of the Moebius band (homeomorphic to  $S^1$ ) to the boundary of the disk. Using the Mayer-Vietoris exact sequence and the fact that the Moebius band is homotopy equivalent to  $S^1$ , compute the singular homology groups of this surface. (In fact, this is the projective plane.)