Exercises for Topology I – Sheet 10

University of Bonn, WS 2018/19

Exercise 37. Show that any map $f\colon \mathbb{RP}^n \to \mathbb{RP}^n$ has a fixed point if n is even. Decide whether there is a map $f\colon \mathbb{RP}^n \to \mathbb{RP}^n$ without fixed point if n is odd.

Exercise 38. Construct for every natural number $m \in \mathbb{Z}$ a selfmap $f\colon X \to X$ of a connected finite CW-complex with exactly one fixed point and Lefschetz number $\Lambda(f) = m$.

Exercise 39. Let $p\colon X \to Y$ be a finite covering with d-sheets with a finite CW-complex Y as base. Show that X inherits the structure of a finite CW-complex and prove $\chi(X) = d \cdot \chi(Y)$.

Exercise 40. Let G be a finite group which acts freely on S^{2n} for some $n \geq 0$. Show that G has at most two elements.

to be handed in on **Wednesday, 19.12.2018**