

Homework 5

1. Prove that every connected cell complex is path connected.
2. Compute the fundamental group of the Klein bottle.
3. Construct a cell decomposition for the projective space $\mathbb{R}P^n$, $n \geq 2$, and using this decomposition compute its fundamental group.
4. Let X be the 2-dimensional sphere S^2 with the north and south poles glued together. Compute the fundamental group of X .
5. Using van Kampen theorem, compute the fundamental group of $\mathbb{R}^n - \{x_1, \dots, x_k\}$, $n \geq 2$.