

## HOMEWORK 8 – 2020

**Exercise 1.** Using Van Kampen theorem compute the fundamental group of  $\mathbb{R}^3 \setminus S^1$ .

**Exercise 2.** Show that the spaces  $\mathbb{C}P^2$  and  $S^5 \times \mathbb{C}P^\infty$  have the same homotopy groups but they are not homotopic. (Hint: Use fibrations with  $\mathbb{C}P^2$  and  $\mathbb{C}P^\infty$ .)