# Writing Assignment 5

**Due Monday, March 15, 11:59 PM**

Choose one of the following questions and write about it:

1. Why is $\pi_1(X, x_0)$ a group?

2. If $X$ is path-connected, why is $\pi_1(X, x_0)$ isomorphic to $\pi_1(X, x_0')$ for any choice of $x_0, x_0' \in X$?

3. I claimed any group should be the set of symmetries of something. What is $\pi_1(X, x_0)$ the symmetry group of? (You may want to look up the notion of a covering space for this challenging question.)