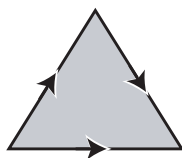


Math 8062 Homework 1

Due Thursday, 1/20/22

1. In Hatcher's book: Chapter 0 (p. 18), Exercise 1.
2. Consider a cell complex X , with one 0-cell, one 1-cell, and one triangular 2-cell. The three sides of the triangle are identified to the same edge, with the following orientations:



Prove that X is contractible. *Hint:* It really helps to visualize this object. In fact, it can be made out of paper or cloth, and embedded in \mathbb{R}^3 . To actually prove contractibility, consider using the homotopy equivalence criterion on page 13 of Hatcher.

3. Let x_0, x_1 be points in the same path-component of a topological space X . Construct a bijection between $\pi_1(X, x_0)$ and the set of homotopy classes of paths from x_0 to x_1 .
- 4, 5. In Hatcher's book: Section 1.1 (p. 38), Exercises 1 and 3.