

Math 581 Homework 13

May 9, 2022

Problem 1 (10-8).

Problem 2 (10-9).

Problem 3 (10-10).

Problem 4 (10-11).

Problem 5 (10-12).

Problem 6 (10-13).

Problem 7 (10-14).

Problem 8 (10-15).

Problem 9. Let $U \subseteq \mathbb{R}^2$ be any nonempty, simply-connected, open subset. Choose $x \in U$. Prove that $\pi_1(U - \{x\})_{\text{ab}} = \mathbb{Z}$.