UF MTG 4303/5317
Introduction to Topology 2
Spring 2024

Homework 6

Due Friday, April 19, anytime, on Canvas

Reading. Munkres §73–77.

Problems.

1. §74 #1. Find a presentation for the fundamental group of $\mathbb{R}P^2 \# T$.
2. §75 #1. Calculate $H_1(\mathbb{R}P^2 \# T)$. Assuming that the list of compact surfaces given in Theorem 75.5 is a complete list, to which of these surfaces is $\mathbb{R}P^2 \# T$ homeomorphic?
3. §75 #3. Let X be the quotient space obtained from an 8-sided polygonal region P by pasting its edges together according to the labelling scheme $acadbcb^{-1}d$.

   (a) Check that all vertices of P are mapped to the same point of the quotient space X by the pasting map.

   (b) Calculate $H_1(X)$.

   (c) Assuming X is homeomorphic to one of the surfaces given in Theorem 75.5 (which it is), which surface is it?

Recommend Problems (not to turn in).

- By cutting and pasting, show that the connected sum of a torus and a projective plane is homeomorphic to the connected sum of a Klein bottle and a projective plane.
- §73 #2
- §74 #6