

Math 215A — UCB, Spring 2017 — William H. Guss
Smooth Manifolds Examples — Homework 2

We will revisit projective spaces on a finite dimensional field \mathbb{K} over \mathbb{R} in addition to different maximal atlases on manifolds. For this assignment we will let (X, A) be a smooth manifold with X a topological manifold and A a smooth structure on X .

(2.1a) Consider the smooth manifold $X = \mathbb{RP}^1 \times \mathbb{R}^2$. Show that the one-point compactification of X is homeomorphic to the Mobius band¹

(2.2b) Let $\mathbb{X} = \mathbb{R}$. Give examples of multiple different smooth structures A_i on X .

¹Some authors refer to this as the Mobius strip. A good place to start is the quotient definition.