

Title

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Thursday 20th August, 2020

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Exercise 1.1.

Show that $\{(\mathbb{R}^1, \text{id}), (\mathbb{R}^1, x \mapsto x^3)\}$ is *not* a smooth atlas.

Exercise 1.2.

Let $S^1 := \{(x, y) \in \mathbb{R}^2 \text{ s.t. } x^2 + y^2 = 1\}$ with charts given by stereographic projection from $(0, 1)$ and $(0, -1)$ on $U = S^1 \setminus \{(0, 1)\} \longrightarrow \mathbb{R}$ and $V = S^1 \setminus \{(0, -1)\} \longrightarrow \mathbb{R}$.

Show that this gives a smooth atlas.

Exercise 1.3.

Write down a smooth atlas on the unit square.