

# Title

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Thursday 20<sup>th</sup> August, 2020

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## 1 Thursday, August 20

### Exercise 1.1.

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

### Exercise 1.2.

Let  $S^1 := \left\{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 = 1\right\}$  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.