1) Let $M$ be a set with two compatible $n$-dimensional atlases $\mathcal{A}$ and $\mathcal{B}$. Show that these atlases induce the same topology on $M$.

2) Show that there is no structure of differentiable manifold on $[0, +\infty)$ which induces the standard Euclidean topology.

3) Show that there is no atlas on the circle $S^1$ which induces the standard topology and is composed of only one chart.