Additional Group Problems Assignment 16

1. Let $H = \{[\begin{smallmatrix} a & 0 \\ 0 & 1 \end{smallmatrix}] : a \in \mathbb{R}, a \neq 0\}$.

   (a) Show that H is a subgroup of $GL(2, \mathbb{R})$.

   (b) Find a group that we have dealt with in class that is isomorphic to H, and prove that it is isomorphic.

2. Prove for any group G, $\mathrm{Aut}(G)$ is a group under composition.