1. Show that the statement of the Mostow rigidity does not hold for dimension 2. Explain why the proof via the Gromov norm fails in this case.

2. Let $\Gamma$ be the fundamental group of a closed hyperbolic $n$–manifold. Recall that the inner automorphism group $\text{Inn}(\Gamma)$ is the normal subgroup of $\text{Aut}(\Gamma)$ consisting of all the inner automorphisms (conjugations), and the outer automorphism group $\text{Out}(\Gamma)$ is the quotient group $\text{Aut}(\Gamma)/\text{Inn}(\Gamma)$. Show that $\text{Out}(\Gamma)$ is finite if $n \geq 3$, or infinite if $n = 2$.

3. Let $M$ be a closed $n$–manifold. Suppose that $M$ has a finite covering space $M'$ which admits a (complete) hyperbolic structure. Show that $M$ also admits a hyperbolic structure.