1.

2.

3. Lemma. If G a (finite) discrete group acts on an orientable manifold M such that the action is smooth, free and proper, such that for each $g \in G$ and $p \in M$, $\det(d_p g) > 0$ then there is an induced orientation on M/G.

Proof. For convenience, take the section $s : M \to \Lambda^n TM$ so that $s > 0$. Let $q : M \to M/G$ be the quotient map induced by the group action, and let $\{V_\alpha\}_{\alpha \in \mathcal{A}}$ be an open cover for M with $q^{-1}(V_\alpha) = \bigsqcup_1^r U_\alpha^i$ and $q|_{U_\alpha^i} : U_\alpha^i \xrightarrow{\cong} V_\alpha$. Now let $\{\eta_\alpha\}_{\mathcal{A}}$ be a partition of unity subordinate to the V_α $\square$

Denote $j : S^d \to S^d$ as the antipodal map. When d is odd, we have an isotopy $1_{S^d} \sim j$ via $H((z_1, \ldots, z_{\frac{d+1}{2}}), t) = (e^{i\pi t} z_1, \ldots, e^{i\pi t} z_{\frac{d+1}{2}})$,