

Problem Set #2

Due: Wednesday, January 25

- (1) If $f : S^n \mapsto S^n$ is a continuous map such that $f(P) \neq P$ for all $P \in S^n$, show that f is homotopic to the antipodal map.
- (2) If $f : S^n \mapsto S^n$ is a continuous map such that $f(P) \neq -P$ for all $P \in S^n$, show that f is homotopic to the identity map.
- (3) For two continuous maps $f, g : X \mapsto S^n$ such that $f(x) \neq -g(x)$ for all $x \in S^n$, show that $f \simeq g$.
- (4) Show that the map from S^2 to itself that takes (x, y, z) to $(x, y, -z)$ is homotopic to the identity map, and the map that takes (x, y, z) to $(-x, -y, z)$ is homotopic to the antipodal mapping.

Note that the correction to Chapter 7 of "Introduction to Topological Manifolds" was given last time