

HOMEWORK 9

Exercise 1. Let $f : S^{n-1} \rightarrow Y$ be a map and $s_0 \in S^{n-1}$. Prove that f can be extended to a map $F : D^n \rightarrow Y$ if and only if the homotopy class $[f] \in \pi_{n-1}(Y, f(s_0))$ is zero.

Exercise 2. Let $A \subset X$ be a pair of CW-complexes and $f : A \rightarrow Y$ a map. If $\pi_{n-1}(Y, y_0) = 0$ for every $y_0 \in Y$ whenever $X - A$ contains a cell in dimension n , then f can be extended to $F : X \rightarrow Y$. Prove.