

HOMEWORK 8 – 2017

Exercise 1. Let $f : M \rightarrow N$ be a map between two oriented compact manifolds of dimension n with fundamental classes $[M]$ and $[N]$, respectively. We say that f has degree d if

$$f_*([M]) = d[N].$$

Prove that for every oriented compact manifold M of dimension n there is a map $f : M \rightarrow S^n$ of degree 1.

Exercise 2. Use cup product and \mathbb{Z}_2 coefficients to show that $\mathbb{R}P^3$ is not homotopy equivalent to $\mathbb{R}P^2 \vee S^3$.