

Configuration spaces

Problem Set 6
WS 2013/14

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Exercise 1

Let $X = S^k \vee S^n$, $n, k \geq 2$. Let $i_n: S^n \rightarrow X$ and $i_k: S^k \rightarrow X$ be the obvious inclusions. Show that $[i_k, i_n] \in \pi_{n+k-1}(X)$ has infinite order.

Exercise 2

Let $n \geq 2$ and $Y = S^n \vee S^n \vee S^n$. Show that $\pi_{2n-1}(Y)$ has rank at least 3.

Exercise 3

An H -space is a space X together with a map $\mu: X \times X \rightarrow X$ and an element $x_0 \in X$ such that $\mu((x_0, x)) = \mu(x, x_0) = x$ for all $x \in X$. Show that all Whitehead products in $\pi_*(X, x_0)$ vanish.