Problem 2. Let \( f : X \to Y \) be a map of spaces, and \( x \in X \) any basepoint. Show that the induced map

\[
\pi_n f : \pi_n(X, x) \to \pi_n(Y, f(x))
\]

for \( n \geq 1 \) is a map of \( \pi_1 \)-modules, in the sense that it is \( \pi_1 f \)-equivariant. More precisely, for any \( \gamma \in \pi_1(X, x) \) and \( \theta \in \pi_n(X, x) \) the equation

\[
(\pi_n f)(\gamma \cdot \theta) = (\pi_1 f)(\gamma) \cdot (\pi_n f)(\theta)
\]

holds in \( \pi_n(Y, f(x)) \).