HOMEWORK 4

1. Let $\mathbb{N}$ be the set of positive integers, and $[n] = \{1, 2, \ldots, n\}$. Let $\mathcal{H}_n$ be the group of all permutations (self bijections) g of $\mathbb{N} \times [n]$ such that on each copy of $\mathbb{N}$, g is eventually a translation. More precisely, we require the following condition.

   (a) *There is an n-tuple $(d_1, d_2, \ldots, d_n) \in \mathbb{Z}^n$ such that for each $i \in [n]$ one has $g(x, i) = (x + d_i, i)$ for sufficiently large $x \in \mathbb{N}$.*

   Prove that $\mathcal{H}_n$ is elementary amenable.

2. In the proof of Proposition 3.4, show that $f_\Gamma(g)$ does not depend on the choice of g'.

3. In the proof of Proposition 3.6, prove that the collection of maps j^{n+1} provides the required Γ-equavariant homotopy between the identity and the zero map of $C_b^n(\Gamma, V)$, $n \geq 1$.