4) For any k relatively prime positive integers $\{a_1, a_2..., a_k\}$, there exists a number $N = N(a_1, a_2, ..., a_k)$ such that we can make up any sum of N or more cents using coins of denomination a_1 through a_k. For example, given coins of denomination 6,10 and 15, we can make up c cents for any c at least 30, but we cannot make up 29 cents. So $N(6, 10, 15) = 30$.

Prove that $N(a_1, a_2, ..., a_k)$ always exists by induction on k.