

Problem 5 (due on Monday, November 7)

Let $\mathcal{F}$ be the set of all functions $f: \mathbb{R} \rightarrow \mathbb{N}$ from the real numbers to natural numbers. Prove that there exists a sequence of functions $f_1, f_2, f_3, \dots$ in $\mathcal{F}$ such that for every finite set $A \subseteq \mathbb{R}$ and every $g \in \mathcal{F}$ there is i such that $g(a) = f_i(a)$ for every $a \in A$.

The problem was solved by Levi Axelrod and Ashton Keith. The solutions differ in details but follow similar idea. For a detailed solution and some applications to topology see the following link [Solution](#).

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