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Small sets containing many patterns
We show that if a subset $A$ of $\mathbb{R}$ contains an affine copy of all bounded decreasing sequences, then $A$ must be somewhere dense. On the other hand, given a collection $\mathcal{C}$ of bounded decreasing sequences that decays faster than a fixed threshold sequence, there is a closed and nowhere dense $A$ that contains an affine copy of every sequence in $\mathcal{C}$.

