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Clusters of Integers With Equal Total Stopping Times in the $3X + 1$ *Problem*,
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Abstract

The clustering of integers with equal total stopping times has long been observed in the $3x + 1$ Problem, and a number of elementary results about it have been used repeatedly in the literature [1, 4, 6]. In this paper, we introduce a simple recursively defined function $C : \mathbb{Z}^+ \to \{0, 1\}$, and we use it to give a necessary and sufficient condition for pairs of consecutive even and odd integers to have trajectories that coincide after a specific pair-dependent number of steps. Then, we derive a number of standard total stopping time equalities, including the ones in [3], as well as several novel results.