Conditions on Periodicity for Sum-Free Sets

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Abstract

Cameron has introduced a natural one-to-one correspondence between infinite binary sequences and sets of positive integers with the property that no two elements add up to a third. He observed that, if a sum-free set is ultimately periodic, so is the corresponding binary sequence, and asked if the converse also holds. We present here necessary and sufficient conditions for a sum-free set to be ultimately periodic, and show how these conditions can be used to test specific sets. These tests produce the first evidence of a positive nature that certain sets are, in fact, not ultimately periodic.