Lenny Jones and Maria Markovich
Generating Composite Sequences by Appending Digits to Special Types of Integers,
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Abstract

We say that the positive integer k is *d-composite* if, when you append the digit d, any number of times on the right of k, the resulting integer is composite. Clearly, every positive integer is d-composite when $d \in \{2, 4, 5, 6, 8\}$. In addition, if $\gcd(k, d) > 1$, then k is d-composite. The first author has shown that, for any given fixed digit $d \in \{1, 3, 7, 9\}$, there exist infinitely many positive integers k with $\gcd(k, d) = 1$ that are d-composite. He also showed that 37 is the smallest 1-composite integer and that the pair $(37, 38)$ is the smallest pair of consecutive 1-composite integers. In this article, we prove similar results for special types of integers such as perfect powers, Sierpiński numbers, Riesel numbers, and Fibonacci numbers. For example, among our results, we show that the smallest Fibonacci number F_n, such that both F_n and F_n^2 are 1-composite, is $F_{21} = 10946$.