Lucasian Primality Criterion for Specific Class of $3 \cdot 2^n + 1$

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Abstract: Conjectured polynomial time primality test for specific class of $3 \cdot 2^n + 1$ is introduced
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1 Introduction

In 1960 Kusta Inkeri provided unconditional , deterministic , lucasian type primality test for Fermat numbers [1] . In this note I present lucasian type primality test for specific class of numbers of the form $3 \cdot 2^n + 1$.

2 The Main Result

Definition 2.1. Let $P_m(x) = 2^{-m} \cdot \left(\left(x - \sqrt{x^2 - 4} \right)^m + \left(x + \sqrt{x^2 - 4} \right)^m \right)$, where m and x are nonnegative integers .

Conjecture 2.1. *Let* $N = 3 \cdot 2^n + 1$ *such that* $n > 2$ *and* $n \equiv 1, 2 \pmod 4$

$$\text{Let } S_i = P_2(S_{i-1}) \text{ with}$$
$$S_0 = \begin{cases} P_k(32), & \text{if } n \equiv 1 \pmod 4 \\ P_k(28), & \text{if } n \equiv 2 \pmod 4 \end{cases}$$
$$\text{thus}$$
$$N \text{ is prime iff } S_{n-2} \equiv 0 \pmod N$$

References

[1] Inkeri, K., "Tests for primality", *Ann. Acad. Sci. Fenn.*, A I 279, 119 (1960).