

Conjectured Primality Criterion for Specific Class of Generalized Fermat Numbers

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Abstract: Conjectured polynomial time primality test for specific class of generalized Fermat numbers 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 polynomial time primality test for specific class of generalized Fermat numbers .

2 The Main Result

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

Conjecture 2.1. Let $F_n(b) = b^{2^n} + 1$ such that $n > 1$, b is even , $3 \nmid b$ and $5 \nmid b$.

Let $S_i = P_b(S_{i-1})$ with $S_0 = P_{b/2}(P_{b/2}(8))$, thus
 $F_n(b)$ is prime iff $S_{2^n-2} \equiv 0 \pmod{F_n(b)}$

References

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