3) If one sums the coefficients in the table without first multiplying by powers of five one obtains k-th power residues of two.

Some of this has undoubtedly been observed before and even probably proved but we have no idea how much.

We have enjoyed playing around with these concepts and actually suspect much more than we have indicated here. If anyone is interested in pursuing this further, we shall be glad to hear from him.

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LETTER TO THE EDITOR

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Conjecture 2., made by Mr. Thoro, on page 186 of the October issue, follows immediately from the following theorem found on page 126 of W. J. Leveque, Topics in Number Theory, Vol. I:

Definition

A representation of a positive integer n as a sum of two squares, say $n = x^2 + y^2$ is termed proper if $(x, y) = 1$.

Theorem

If p is a prime of the form $4k + 3$ and $p \mid n$, then n has no proper representation.

Since $F_{2n+1} = F_n^2 + F_{n+1}^2$, and $(F_n, F_{n+1}) = 1$, F_{2n+1} always has a proper representation. Therefore, by the above theorem, no prime of the form $4k + 3$ can divide F_{2n+1}.

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