Two formulas of generalized Fermat numbers which seems to generate large primes

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Abstract. There exist few distinct generalizations of Fermat numbers, like for instance numbers of the form F(k) = a^(2^k) + 1, where a > 2, or F(k) = a^(2^k) + b^(2^k) or Smarandache generalized Fermat numbers, which are the numbers of the form F(k) = a^(b^k) + c, where a, b are integers greater than or equal to 2 and c is integer such that (a, c) = 1. In this paper I observe two formulas based on a new type of generalized Fermat numbers, which are the numbers of the form F(k) = (a^(b^k) ± c)/d, where a, b are integers greater than or equal to 2 and c, d are positive non-null integers such that F(k) is integer.

Conjecture 1:

There exist an infinity of odd integers k such that the number p = (2^(2^k) + 2)/6 is a prime of the form 30*n + 13, where n positive integer.

Examples:

First three such primes p, obtained for k = 3, 5 and 7:

: p = 43 = 1*30 + 13 for k = 3;
: p = 715827883 = 23860929*30 + 13 for k = 5;
: p = 56713727820156410577229101238628035243 = 1890457594005213685907636707954267841*30 + 13 for k = 7.

Note that for k = 9 is obtained a number p with 154 digits!

Conjecture 2:

There exist an infinity of odd integers k such that the number p = (2^(2^k) - 2)/2 is a prime of the form 30*n + 7, where n positive integer.

Examples:

First three such primes p, obtained for k = 3, 5 and 7:

: p = 127 = 4*30 + 7 for k = 3;
: p = 2147483647 = 71582788*30 + 7 for k = 5;
: p = 170141183460469231731687303715884105727 = 5671372782015641057722910123862803524*30 + 7 for k = 7.

Note that for k = 9 is obtained a number p with 154 digits!