OPINION

Fermat's last theorem: The numbers A, B, C are infinite

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ABSTRACT

In the base case of the Fermat equality, the k-digit endings of the numbers in the pairs (A^n, A), (B^n, B), (C^n, C) are equal to the k-digit endings of the numbers a^[n^(k-1)], b^[n^(k-1)], c^[n^(k-1)], where a, b, c are the last digits of the base numbers A, B, C and k is arbitrarily large, that is, the numbers A, B, C are infinite.

Keywords: *Fermat's; Learning; Infinite*

INTRODUCTION

Designations

The a, b, c, p, q, r - the last digits in the numbers A, B, C, P, Q, R in the number system with a prime base n>2.

A_k-k-th (from the end) digit of the number A; $A_{[k]}$-k-digit ending of number A.

Theorem (basic case of the FLT)

For prime *n*>2, and coprimes natural numbers A, B, C not multiple of n from the equality

1. $A^n+B^n-C^n=0$ and k>0
2. $A^n{}_{[k]}=A_{[k]}=a^{n\wedge(k-1)}{}_{[k]}$, $B^n{}_{[k]}=B_{[k]}=b^{n\wedge(k-1)}{}_{[k]}$, $C^n{}_{[k]}=C_{[k]}=c^{n\wedge(k-1)}{}_{[k]}$.

The simplest properties of the equality 1*. Lemmas:

1. $(d^{n-1})_1=1$ (where single digit d is not equal to 0). /Fermat's Little Theorem./
2. Numbers in pairs (*C-B*, *P*), (*C-A*, *Q*), (*A+B*, *R*) {from equalities
3. $[A^n=]$ $C^n-B^n=(C-B)P$, $[B^n=]$ $C^n-A^n=(C-A)Q$, $[C^n=]$ $A^n+B^n=(A+B)R$} are coprime and P[2]=Q[2]=R[2]=01 (because the digits p=q=r=1).
4. The digit $(g^n)_t$ does not depend on g_t. /Consequence from Binom Newton./
5. $A_{[2]}=a^n{}_{[2]}$, $B_{[2]}=b^n{}_{[2]}$, $C_{[2]}=c^n{}_{[2]}$. Corollary from 02°,
6. If $A_{[k]} = a^{n\wedge(k-1)}{}_{[k]}$, then $A^n{}_{[k+1]} = a^{n\wedge k}{}_{[k+1]}$. Corollary from the Newton binomial for the number $A=A°n^k+a^{n\wedge(k-1)}{}_{[k]}$.

PROOF OF THEOREM

Indeed, for *k=1* the equalities 2* are a statement of a Little Theorem. For *k=2*, the equalities 2* follow from 03°, where $P_{[2]}=Q_{[2]}=R_{[2]}=01$.

Subsequent digits with k>2 are calculated from the INFINITE series of Newton binomials for the numbers A, B, C, written as $A=A°n^k+a^{n\wedge(k-1)}{}_{[k]}$ (see 06°) with increasing k by 1 in each successive iteration.

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