Fermat's Last Theorem: Proof in 1 Operation of Multiplication

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Abstract

After multiplying Fermat's equality by d^n, where prime n>2, d is a single-digit number with base n, 0<d<n, the penultimate digit in the number d^n is not zero (such exists!), the equality turns into inequality.

Fermat's Last Theorem. *Proof in 1 operation of multiplication*

In memory of wife, mother and grandmother

Fermat's Theorem: Equality (for prime degree $n>2$)
1*) $a^n+b^n-c^n=0$ in positive integers a, b, c does not exist.

The notation and lemmas /Pour les preuves des lemmes, voir l'annexe https://vixra.org/pdf/1707.0410v1.pdf /

a', a''; a''' - 1st, 2nd, 3rd digit from the end in the number a in the number system with a prime base $n>2$;
$a_{[2]}$, $a_{[3]}$, $a_{[4]}$ - two-, three-, four-digit ending of the number a;
nn - n*n.

L1. If digit a' is not 0, then $(a^{n-1})'=1$. (Fermat's little theorem.)

L1a. Therefore: $(a^{n-1})^n{}_{[2]}=01$, $(a^{n-1})^{nn}{}_{[3]}=001$.

L2a (key!). There is such a digit d that the second digit $(d^n)''$ is not zero. [Indeed, if second digits in all d^n are equal to zero, then the second digit of the sum of the number series d^n, where d = 1, 2, ... n-1, is not zero and is equal to (n-1)/2, which is incorrect.]
L2b. There is such a digit d that the digit $(d^{nn})'''$ is not zero.
L2c. There is a digit d such that the digit $(a^{nn}+b^{nn}-c^{nn})'''$, where $(a+b-c)'=0$ and $(abc)'=/=0$, is not zero.

L3. For $k>1$, the k-th digit in the number a^n does not depend on the k-th digit of the base a.
L3a. Consequence. If a' is not equal to 0, then digits $a^n{}_{[2]}$ and $a^{nn}{}_{[3]}$ are functions of only a' and do not depend on the digits of higher ranks.

2*) In Fermat's equality 1* two-digit endings of numbers a, b, c, not multiples of n, there are two-digit endings of degrees a'^n, b'^n, c'^n.

Therefore, the number a (like b and c) can be represented as $a=a'^n+An^2$, where $A=(a-a_{[2]})/n^2$, and the number a^n (and b^n and c^n) can be represented as

3*) $a^n=(a'^n+An^2)^n=a'^{nn}+A_{[2]}n^3*a'^{n(n-1)}+A°n^5*a'^{n(n-2)}+...$,
(and similarly $b^n=...$ and $c^n=...$), where $[(A'+B'-C')/n^3]_{[2]} = -[(a'^{nn}+b'^{nn}-c'^{nn})/n^3]_{[2]}$ and [insofar as $(a^{n-1})'=(b^{n-1})'=(c^{n-1})'=1$] $a'^{n(n-1)}{}_{[2]}=b'^{n(n-1)}{}_{[2]}=c'^{n(n-1)}{}_{[2]}=01$.

And now the equality 1 * can be written by five-digit endings in the form:

4*) $(a'^{nn}+b'^{nn}-c'^{nn})_{[5]}+(a+b-c)_{[2]}n^3 + Dn^5 = 0$.

L4. If in the equality 1* the number a ends, for example, with k zeros (k is always greater than 1!), then by multiplying the equality by some number g^{nnn} one can convert the ending of the number b (or c) of length kn+5 digits into 1.

And now the very PROOF of Fermat's theorem.

5*) Multiply equalities 1* and, accordingly, 4* by the number d^n from L.2.

And we see that the two-digit ending of the number $(a+b-c)_{[2]}$ multiplied by the single-digit number d, and the two-digit ending of the number $[(a'^{nn}+b'^{nn}-c'^{nn})/n^3]_{[2]}$ - EQUAL IN VALUE (but with the opposite sign) - multiplied by the two-digit ending of the number d^n with a non-zero second digit. And, therefore, the equivalent equality 4* turned into INEQUALITY.

The second case (for example, the number a ends in k zeros) is proved similarly and even somewhat easier.

After converting the (kn+5)-digit ending of b into 1, we obtain the equality of the three-digit ending of the significant part of the power a^n to the three-digit ending of the base of the number c^n without the unit (kn)-digit ending. And now, after multiplying Fermat's equality by d^n (out of 5 *), the two-digit ending of the number c will be multiplied by a single-digit d, and the two-digit ending of the number a with an EQUAL ending will be multiplied by the two-digit ending of the number d^n with an equal last digit $(d^n)'$ [...=d′] but with positive d′′, thus turning equality into an equivalent inequality.

This proves the truth of Fermat's great theorem for a prime degree.

http://rm.pp.net.ua/publ/fermat_39_s_last_theorem_proof_in_1_operation/21-1-0-2140

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