

Fermat's theorem: $A+B-C$ is not a natural number

In Memory of my MOTHER

All numbers are written in the number system with a prime base n , where $n > 2$.

Let's assume that for co-prime natural numbers A , B , C and prime $n > 2$

1°) $A^n + B^n - C^n = 0$, where, as it is known (see [viXra:1707.0410](#)),

1a°) $C > A > B > U = A + B - C = un^k > 0$ ($k > 1$),

1b°) $A = U + a$, $B = U + b$, $C = U + c$, где $a + b - c = 0$, $a = A - U$, $b = B - U$, $c = C - U$.

Proof of the FLT

2°) Let's multiply the equality 1° by g^n (according to Fermat's small theorem, it exists; the notations of the numbers are left the same), where g is the number from equality $ug = n^v - 1$, from here

3°) $U = (n^v - 1)n^k = n^s - n^k$, where $k = \text{const}$, $s = v + k$ and $s > nk$.

Now (taking into account 1b°) the equality of 1° can be written as

4°) $(a + n^s - n^k)^n + (b + n^s - n^k)^n - (c + n^s - n^k)^n = 0$, or $[(a - n^k) + n^s]^n + [(b - n^k) + n^s]^n - [(c - n^k) + n^s]^n = 0$,

from which (after the expansion of binomials of Newton) it follows that the number of

5°) $D = (a - n^k)^n + (b - n^k)^n - (c - n^k)^n$ is divisible by n^s , because all the other terms contain a factor n^s .

Now let's compute the zero endings in each sum consisting of three terms:

6°) $d = a^n + b^n - c^n = (\text{см. 1b°}) = (A - U)^n + (B - U)^n - (C - U)^n = [(A - U)^n - A^n] + [(B - U)^n - B^n] - [(C - U)^n - C^n]$,

where all three expressions in square brackets end with $k + 1$ zeros (1 zero adds a second factor in the expansion of the sum of powers) with the fourth digits are equal among the three.

7°) $e = (a^{n-1} + b^{n-1} - c^{n-1})n^k$. This (and only!) and all subsequent sums end in kt ($t = 1, 2, \dots, n$) zeros.

And, consequently, the number D is not divisible by n^s , and the identical equalities 4° and 1° are not satisfied on the $(k + 2)$ -th digit.

Which confirms the truth of the FLT.

8°) If A is divisible by n^k , then the numbers U , $C-B$, a , $c-b$ and d are divisible by n^{kn-1} , and e is divisible by n^{kn+k-1} .

Mezos. July 11, 2018