The last theorem of Fermat. The simplest proof. Edited text

In Memory of my MOTHER

All calculations are done with numbers in base \( n \), a prime number greater than 2.

**The contradiction:**
The Fermat equality does not hold over \((k+1)\)-th digits, where \( k \) is the number of zeroes at the zeroes ending of the number \( U=A+B-C=un^k \).

**The notations** that are used in the proofs:
\( A'/A(k) \) – the first / the \( k \)-th digit from the end of the number \( A \);
\( A_{[k]} \) is the \( k \)-digit ending of the number \( A \) (i.e. \( A_{[k]} = A \mod n^k \));
\( A_{[k+]} \) – the number remaining after removing the \( k \)-digit ending of number \( A \).

So, let's assume that for natural numbers \( A, B, C \) and prime \( n>2 \):

1°) \( A^n+B^n=C^n \), or \( A^n+B^n-C^n=0 \), where

2°) \( U=A+B-C=un^k \), where \( n \) is not a cofactor of \( u \). And, if the digit

3°) \( u^*=[U_{(k+1)}-\left((A_{[k]}B_{[k]}-C_{[k]})_{(k+1)}\right)]'=0 \),

then we multiply the equality of 1° by 2° [for convenience, the notation of all numbers and numbers with new values will remain the same], after which

4°) \( u^*=(A_{(k+1)}+B_{(k+1)}-C_{(k+1)})'=0 \) [because \( A_{[k]}+B_{[k]}-C_{[k]} \) can have only two values: 0 or \( n^k \)].

5°) Lemma. \( A'=A^n \) [another form of Fermat's little theorem].

6°) From Newton binomial \( (A_{(k+1)}n^k+A_{[k]})^n=Dn^{k+1}+A_{(k+1)}n^{k+1}+A_{[k]}^n \), it follows that \((k+1)\)-th digit of the degree does not depend on \((k+1)\)-th digit of the base.
Proof of the FLT

According to 5° and 2°, the digit \((A^{k+n}+B^{k+n}-C^{k+n})'= (A_{k+1}+B_{k+1}-C_{k+1})'=u^* \neq 0\)
and, after recovery of discarded endings \(A_{[k]}, B_{[k]}, C_{[k]}\) in numbers \(A, B, C\), retains its value
because \((A_{[k]}^{n}+B_{[k]}^{n}-C_{[k]}^{n})_{[k+1]}=0\) (see 6° and 1°) and the digits \(A_{(k+1)}, B_{(k+1)}, C_{(k+1)}\) of the bases are
not involved in the formation of the digit \((A^n+B^n-C^n)_{(k+1)}\) (see 6°).

This confirms the truth of Fermat's Last Theorem.