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# Fermat's theorem: First case: ABC is not a multiple of n

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

*Notations*: A', A'', A''' – the first, second, third digit from the end of the number A.

0°) **Lemma**.

The sum of the numbers $a_i^n$ (where i=1, 2... n-1) ends by d00, where d is a digit and d=(n-1)/2.

Let's assume that for co-prime natural numbers A, B, C, where (ABC)'≠0 and n is a prime number n>2,

1°) [D=] $A^n+B^n-C^n=0$, where, as it is known [see viXra:1707.0410 *],
2°) $(A+B-C)_{[2]}=0$
From here we find that A'+B'-C' is either 0 or n-1, and therefore the digit
3°) u''=(A''+B''-C'')' is either 0 or n-1.

4°) If we multiply 1° by $g^{nnn}$, where g=1, 2, ... n-1, we find n-1 equivalent equations..

**Proof of the FLT**

For A=A', B=B', C=C', the sum of powers for each of the letters A, B, C, as well as the sum of all n-1 numbers D from 4°, has an ending d00 [where d=(n-1)/2 – see 0°].

In all the equations 4° the digit D'''≠0, otherwise after the operation 4° with this equality with D'''=0 the digit D''' in the total sum is also zero.

Hence, the maximum number of equations in which D'''=1, is (n-1)/2. This means that there is an equality with D'''>1.

Now if we put back the digits A'', B'', C'' into this equality, this digit can not be transformed into 0, because, as it follows from the binomial theorem

$A^n=(...+A''n+A')^n$, $B^n=(...+B''n+B')^n$, $C^n=(...+C''n+C')^n$

and the Small Theorem, they add to the digit $D'''$ (>1!) only the digit

$(A'^{n-1}A''+B'^{n-1}B''-C'^{n-1}C'')'$ [$=u''$, i.e. 0 or n-1, – see 3°], where $A'^{n-1}{}'=B'^{n-1}{}'=C'^{n-1}{}'= 1$.

From what follows the truth of FLT.