Abstract

This paper magically shows very interesting and simple proof of Fermata Last Theorem. The proof describes sufficient conditions of that the equation holds and contradictions on them to satisfy the theorem. If Fermat had proof most probably his proof may be similar with this one.

Introduction

Fermata Last Theorem states that $a^n + b^n = c^n$ has no non-zero integers solution for n>2. It is proposed first by Pierre de Fermat , who is amateur of mathematics. Fermat Last Theorem is a mystery for centuries. Even after the problem is solved mathematicians are researching for simple proof while the vast majority of mathematicians believe that no simple proof of FLT exists.

Proof: - the proof of FLT for the case power 4 is done by infinite decent already. Here we are going to prove for prime power by contradiction. Let $a^n + b^n = c^n$ has solution out of zero for n>0. To simplify and for better understanding let us start with the case power 3, and all the same is true for prime factors.

$a < b < c$ for all case so that we can identify differences in derived equations.

$a^3 + b^3 = c^3$ $a^3 = c^3 - b^3$ $a^3 = (c-b)(c^2 + cb + b^2)$	If 3 is not a factor of a $c - b = p^3$ $c^2 + cb + b^2 = m^3$ $l^3 - p^6 = 3cb$

If 3 is a factor of the sum or difference of two cubes then 9 is.

Hence in primitive cubic triplet one of the triplets must be the multiple of 3, but we don't have the method to identify exactly which one is the multiple of 3. They are going to fight one another to be the multiple of 3 and that makes the triplet left without natural number solution. How?

Let a_1 is the multiple of 3 ($a_1 < b_1 < c_1$) in Equation $a_1^3 + b_1^3 = c_1^3$.......... ....(1)

$(a_1 + b_1)(a_1^2 - a_1b_1 + b_1^2) = c_1^3$ $a_1 + b_1 = r_1^3$ $a_1^2 - a_1b_1 + b_1^2 = k_1^3$	$a_1^3 = (c_1 - b_1)(c_1^2 + c_1b_1 + b_1^2)$ $c_1 - b_1 = 9p_1^3$ $c_1^2 + c_1b_1 + b_1^2 = 3m_1^3$	$b_1^3 = (c_1 - a_1)(c_1^2 + c_1a_1 + a_1^2)$ $c_1 - a_1 = q_1^3$ $c_1^2 + c_1a_1 + a_1^2 = l_1^3$

When we rearrange and substitute and simplify we can get

$2a_1 = r_1^3 - q_1^3 + 9p_1^3$ $2b_1 = r_1^3 + q_1^3 - 9p_1^3$ $2c_1 = r_1^3 + q_1^3 + 9p_1^3$	$r_1^3 = 9p_1^3 + q_1^3 + 6p_1q_1r_1$ $4k_1^3 = r_1^6 + 3(q_1^3 - 9p_1^3)^2$ $4l_1^3 = q_1^6 + 3(r_1^3 + 9p_1^3)^2$ $4m_1^3 = 27p_1^6 + (r_1^3 + q_1^3)^2$	✓If one of these Equations has natural number solution, then the others and fermata's equations have natural solution. ✓If any problem has similar equation in its structure, they got the solution

In similar way b claims that it is the multiple of 3, which leads also for some of similar equations that will solve the equation if one exist.

Let b_2 is the multiple of 3 ($a_2 < b_2 < c_2$) in Equation $a_2^3 + b_2^3 = c_2^3$.......... ....(2)

$(a_2 + b_2)(a_2^2 - a_2b_2 + b_2^2) = c_2^3$ $a_2 + b_2 = r_2^3$ $a_2^2 - a_2b_2 + b_2^2 = k_2^3$	$a_2^3 = (c_2 - b_2)(c_2^2 + c_2b_2 + b_2^2)$ $c_2 - b_2 = p_2^3$ $c_2^2 + c_2b_2 + b_2^2 = m_2^3$	$b_2^3 = (c_2 - a_2)(c_2^2 + c_2a_2 + a_2^2)$ $c_2 - a_2 = 9q_2^3$ $c_2^2 + c_2a_2 + a_2^2 = l_2^3$

When we rearrange and substitute and simplify we can get

$2a_2 = r_2^3 - 9q_2^3 + p_2^3$ $2b_2 = r_2^3 + 9q_2^3 - p_2^3$ $2c_2 = r_2^3 + 9q_2^3 + p_2^3$	$r_2^3 = p_2^3 + 9q_2^3 + 6p_2q_2r_2$ $4k_2^3 = r_2^6 + 3(9q_2^3 - p_2^3)^2$ $4l_2^3 = 27q_2^6 + 3(r_2^3 + p_2^3)^2$ $4m_2^3 = p_2^6 + (r_2^3 + 9q_2^3)^2$	✓If the first case equations have solution, the one also must have ✓If so when we search in similar procedure, we will get r2 = r1, p2 = q1, q2 = p1 and so forth. This contradicts the existence of different problem that drives similar Equations in structure. QED

The same is true for all prime powers no need to set n. And even there are more steps. Any comments and correction welcome, because I expect much from professionals.

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