An Ephemeral Approach to Solving Fermat's Last Theory
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Abstract-Hypothesis:

While FLT was proved for quite some time ago by Wiles/Taylor, it remains out of reach for the vast majority of mathematicians, due to the need of a strong background in modularity theory for *elliptic* curves, and other arcane branches of Number Theory. Thus most mathematicians are hoping for a proof that is a little easier to comprehend using Diophantine equations. This paper is intended to satisfy that need.

I have tried hard to making the writing light and entertaining. Writing this paper was like writing a book, a tremendous amount of blood, sweat and tears went into it's construction. Thousands of hours of math work. Do not feel the need to try to rush thru it, three subsequent readings of perhaps an hour each should allow complete absorption of this creative work of mathematics art.

Separate proofs will be presented for Sophie Germain Case 1 and Sophie Germain Case 2. For those uneducated in Sophie Germain's work, the two cases are rather simple to understand. For the formula $A^P + B^P = C^P$,

Case 1: None of the coprime variables A, B or C will have a factor of P.
Case 2: One of the coprime variables A, B or C will have a factor of P.

In my lexicon SGC1 represents Sophie Germain Case 1, and SGC2 represents Sophie Germain Case 2.

For SGC1, I will use a method based upon MDDG (*Multi-Dimensional Diophantine Geometry*), which will show that the 3 variables A, B and C can not be coprime. The proof method may also be applied to SGC2. Both Algebriac and Geometric elements and manipulations are employed.

For SGC2, a second proof will be iterative, we will show that the variable that contains the factor P, will have infinite factors of P, thru an iterative process. It is noted here, that from what I gather reading historical records Pierre Fermat favored this method in many of his proofs. Of course anyone well versed in FLT (*Fermat's Last Theory*) is aware that the proof for the case N=4, used the iterative method referred to as Infinite Descent, as the 3 variables A, B and C descend with each iteration towards zero. We may consider the proof in this exposition for SGC2 perhaps as a proof by Infinite Ascent, as the variables A, B and C must approach infinity.

In my earlier 9th proof attempt, which I wrote up several months ago, I used a metaphor of climbing Mount Everest liberally throughout the proof in various places, and I will reuse much of that proof in this new document. I hope you find the reading of this proof entertaining and sparkling. Or at least you may find it more entertaining and sparkling than your average Diophantine proof you may find on arXiv. For quite certainly, it is highly conceivable that others would have discovered a similar proof years before,

but due to the rigid social structures which pervade higher level mathematics analytical work, and a boring presentation, that a potential earlier talented individual may have gone unnoticed. Note, mathematics manipulation is only a way to pass the time for me, my true skills lie in music creation and engineering, thus you may find my notation somewhat arcane, for which I apologize in advance.

For anyone with basic knowledge of FLT, you may want to skip this paragraph. For any case of $A^N + B^N = C^N$, where N is >=3, it is relatively easy to show that if N is a prime number that it is only required to prove FLT for prime numbers. Additionally, it is only necessary to prove FLT for A, B and C being coprime for obvious reasons. For even numbers number value exponents N, any that are composite and have an odd number factor will be provable by the odd number having a prime number factor, and if N = 4, 8, 16, 32 etcetera, Fermat's proof for N =4 by Infinite Descent serves as the simple basis of a proof. I will not elaborate on the statements in this paragraph, as the proofs are very simple and can be viewed on a 1000 different web portals.

HYPERLINKED INDEX

Conventions used in this Paper:

Please note that instead of using the congruence operator of 3 parallel lines, I will instead be using a standard equality operator, for all modulus equations, as was the practice used regularly in the somewhat distant past. This will save me considerable mouse clicks during the creation of this document.

The abbreviation FLT will be used to indicate Fermat's Last Theory.

In the last 20 years of working on this theory, I have become accustomed to using a Symmetrical Form of the presentation of FLT, as follows: $A^P + B^P + C^P = 0$, this form has the benefit of reducing the amount of analysis when dealing with a symmetrical problem such as FLT. It should be mentioned the first Mathematician to seriously do some work on this problem other than Pierre Fermat himself was Leonard Euler, and he wrote his proof for the case N = 3 in the Symmetrical form as well. At times I mat switch over to the non-symmetrical standard form of $A^P + B^P = C^P$, when the NSF (*non-Symmetrical Form*) may yield better clarity in an explanation.

Finally, the variables A, B and C are broken down into factors A_1, A_2, B_1, B_2, C_1 and C_2. The subscripts help to organize the factoring and memorizing of these 6 variables.

FOUNDATION THEORY, Necessary to Gain Basic Skills to understanding Fermat's Last Theorem

Note, there is a certain amount of repetition in this section, and some of the final forms referred to as "Presentation of D", may be not actually be required for the two final proofs, but are of interest in gaining a solid foothold into the fundamentals, none-the-less.

These next few pages will give the basic equational tools and gear necessary for climbing to the peak of the Mount Everest of math problems. Note the Himalaya's peaks are many and this Sherpa can only explore a limited number of them. I have found two routes to the summit, from which an inspiring view and feeling well being may spring. The climb is not without ardor, and to try to push to quickly to the summit may find one out of breath, and a fuzzy mind. Thus it is essential to accumulate these basic equational tools and commit them to memory. In further documents in this proof, the level of detail that will be expressed DEPENDS on a deep integral mathematics absorption of this foundational base.

At the completion of this portion of the proof we will be at Base Camp, and prepared to ascend to the heights of Everest.

The starting point will be defining the problem. It is normally defined as follows:

$$X^N + Y^N = Z^N$$

With X, Y and Z being positive integer values, and N being an integer value >= 3. That there exist no possible solutions.

A proof for the case for N = 4 was shown by Fermat in a margin of his copy of Arithmetica, and later published by his son, after his death. Adjacent to the short detailed proof which makes use of the technique of Infinite Descent, is a comment that there are no solutions for any other higher exponent than 2, and that the margin of the paper is to small to hold this proof. Hard to say one way or another if he had a rock solid proof.

Anyway moving on, if N is any power of 2 >= 4 the proof would also hold, based upon simple algebraic use of exponent rules. Using similar reasoning, we can prove that any odd number exponent which is a composite number, will also hold true, if we can proof either of the factors for that composite number. And of course any even number which is a product of an odd prime number or odd composite number will also be "covered" by a proof for prime numbers which are >=3.

Based upon the above, and my personal preferences, we may rewrite the starting point equation as:

$$A^P + B^P = C^P$$

In this presentation, the exponent P represents a prime number >=3, and A, B and C as coprime integers.
The fundamental reasoning that A, B and C are considered as coprime, is that if A and B had a common factor, then C would also, and then we could remove this factor from all 3 variables, and rewrite.

Again based upon personal preference we may rewrite the equation in the symmetrical form as:

$$A^P + B^P + C^P = 0$$

In this presentation, we presume one of the 3 variables A, B and C must be negative. For convenience sake we will assume that C has a negative value. It should be noted that Euler was the first mathematician to find a proof for the case P = 3, and his proof used the symmetrical form. In other words good historical precedent to proceed along this approach vector to the solution.

At this point maybe good to throw in some philosophy (*OH NOOOOOOO!*) Oh yes, consider the following.

This proof could also be for two negative numbers and one positive number, and be equally valid. And if we conveniently ignore the trivial solution aspect, the potential values and polarities of ***negative, zero and positive*** sort of make up a spectrum analogy of the human race coloration and sexual orientation. (*Note, this paper may be burned in "Fahrenheit 451ish fashion" in some fundamentalist republic provinces, and produce lots of heat, and additional* CO_2 *for our sky*.) So much for my comedic relief, back to reality.

FACTORING $A^P + B^P + C^P = 0$

Consider $G^N + H^N$ and $G^N – H^N$ each consists of two factors as follows:

$G^N + H^N = (G + H)(G^{N-1} - G^{N-2}H + G^{N-3}H^2 - \ldots\ldots\ldots + G^2H^{N-3} - GH^{N-2} + H^{N-1})$
Note, alternating polarities

$G^N - H^N = (G - H)(G^{N-1} + G^{N-2}H + G^{N-3}H^2 + \ldots\ldots\ldots + G^2H^{N-3} + GH^{N-2} + H^{N-1})$
Note, same polarities

Note, writing out the above right side factor is time consuming so as a shortcut, consider the using the following functions instead:

$f_a(G, H, P) = (G^{N-1} - G^{N-2}H + G^{N-3}H^2 - \ldots\ldots\ldots + G^2H^{N-3} - GH^{N-2} + H^{N-1})$
(f_a being the additive function factor of $G^N + H^N$)

$f_s(G, H, P) = (G^{N-1} + G^{N-2}H + G^{N-3}H^2 + \ldots\ldots\ldots + G^2H^{N-3} + GH^{N-2} + H^{N-1})$
(f_s being the subtractive function factor of $G^N - H^N$)

While working in the symmetrical presentation of Fermat's Last Theory I do not show the subscript "a" or "s", since all factoring work is from an additive point of view.

We may now expand the presentation form for Sophie Germain Case 1, using the above factoring *Concepts*.

$A_1^PA_2^P + B_1^PB_2^P + C_1^PC_2^P = 0$ (*Specific to SGC1*)
where $A_1^P = -(B + C)$ and $A_2^P = f(B, C, P)$

and $B_1^P = -(A + C)$ and $B_2^P = f\,(A, C, P)$
and $C_1^P = -(A + B)$ and $C_2^P = f\,(A, B, P)$

Similarly, we may expand the presentation for Sophie Germain Case 2:

$A_1^P A_2^P + B_1^P B_2^P + \mathbf{P_1^P} C_1^P C_2^P = 0$ (*Specific to SGC2*)
where $A_1^P = -(B + C)$ and $A_2^P = f\,(B, C, P)$
and $B_1^P = -(A + C)$ and $B_2^P = f\,(A, C, P)$
and $\mathbf{P^{P-1}} C_1^P = -(A + B)$ and $\mathbf{P} C_2^P = f\,(A, B, P)$

At this point, I suppose a reference to Sophie is needed, as well as a simple presentation that can be written out on a blackboard for the class. Let's look at the simpler case of SGC1 first, for P=5.

$A^5 + B^5 + C^5 = 0 = (A+B)(A^4 - A^3B + A^2B^2 - A^3B + B^4) + C^5$

and we could rewrite this as $(A+B)(A^4 - A^3B + A^2B^2 - A^3B + B^4) = -C^5$

The above form looks pretty basic, of course if we used the typical non-symmetrical presentation form instead of $-C^5$ we would simply have C^5. At this point you may wonder, why deal with a symmetrical form at all, which has positive and negative integer variables. Well, when the algebraic juggling gets super complex, using a somewhat simpler form helps to keep the polarity errors from creeping in to the analysis. Of course at this point in the exposition, everything is pretty simple. When we get to the trinomial expansion of $(A + B + C)^P$, the symmetrical form starts to look more appealing.

Sophie Germain around the year 1800 was working on a number of mathematical and physics problems, her work on Fermat's Last Theorem has had a profound effect on the understanding of the underlying aspects of the problem. And her definition of Case 1 and Case 2 analysis of the equation is a starting point in understanding the two fundamental analysis approaches which must be employed.

Case 1, is when **none** of the integer variables A, B or C contains a factor of P.

Case 2, is when **one** of the integer variables A, B or C contains a factor of P.

Other than this simple branching aspect of the proof definition, no other aspects of Sophie Germain's extensive work on Fermat's Last Theory are utilized.

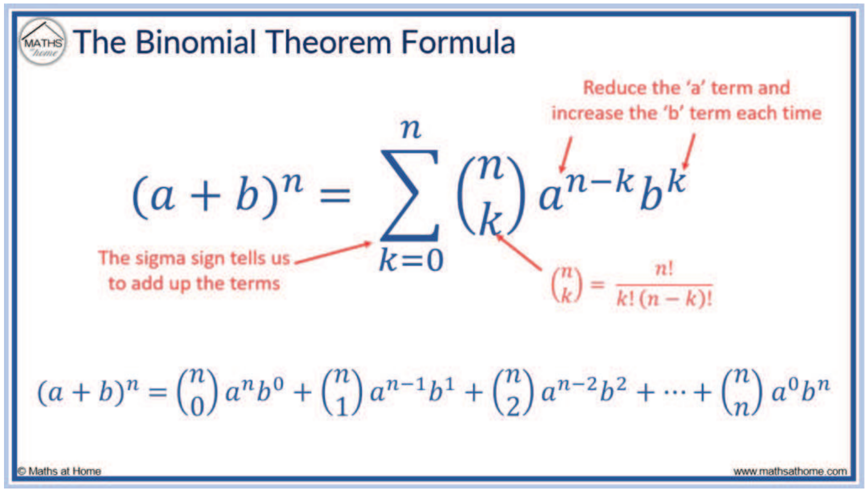
Binomial Expansion of $(a+b)^P$

When $(a+b)^P$ goes thru binomial expansion, the expanded form may be presented/condensed as:

$a^P + P\,(f(a,b)) + b^P$ *(with $P\,(f(a,b))$ representing the sum of all center terms)*

Basically, all of the center term coefficients will have a prime factor of P.

This may be understood by absorbing the basic standard formula for Binomial Expansion which is noted to the right:



Maybe a little too abstract? Let's try a few prime exponent examples to add light to the concept.

$(a+b)^3 = a^3 + 3a^2b + 3\,ab^2 + b^3$
$(a+b)^5 = a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5$

If you study the coefficient formula for a bit (*shown in Red Text above*), it will make sense, that all of the center term coefficients must have a prime factor of P, since a prime factor of n occurs in the numerator and can not occur in the denominator for all center term coefficients.

Below is Pascal's triangle from Wiki which shows all of the term coefficients up to exponent 7:
(*It's a classic math diagram!*) The center term coefficient prime factors are obvious for 3, 5 and 7.

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
1 7 21 35 35 21 7 1

Trinomial Expansion of $(A+B+C)^P$

Now for Trinomial Expansion, pretty much the same applies, but we will now have to start thinking somewhat geometrically, but with supportive algebraic logic.

$(A + B + C)^3 =$ *(first diagrams, exponent = 3)*

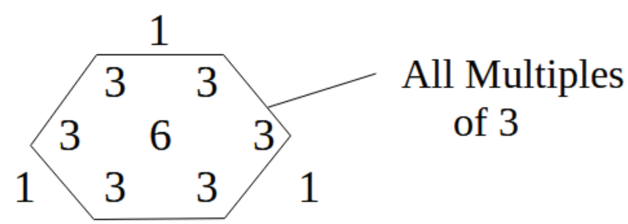
$(A + B + C)^5 =$ *(following diagram, exponent = 5)*

$$C^3$$

$$3AC^2 + 3BC^2$$

$$3A^2C + 6ABC + 3B^2C$$

$$A^3 + 3A^2B + 3AB^2 + B^3$$



C^5

$5AC^4$ + $5BC^4$

10 20 10

10 30 30 10

5 20 30 20 5

A^5 5 10 10 5 B^5

Conceptually blended for ease of Presentation

From the above rather un-artistic graphics we can gain a foothold into Trinomial expansion coefficients, that they all appear to be multiples of the prime exponent.

Formulaically expressed as:

$(A + B + C)^P = A^P + B^P + C^P + P\,(f(A,B,C,P))$

Where $P\,(f(A,B,C,P))$ is a unique positive integer value function representing the sum of all center terms.

Thus we observe the 3 corner terms have coefficients of 1, and all of the center coefficients are multiples of prime exponent value P.

The graphical view is nice, maybe algebraically you may understand that since all non-corner ***perimeter*** binomial expansions have factors of prime P, when we can multiply any horizontal binomial center row coefficients by the outer perimeter angled vertical row coefficients then all interior term coefficients must also contain a factor of prime P.

Perhaps at this point a more tangible proof of the center none-perimeter coefficients is needed. Supposing we rewrite the starting point equation in this analysis as follows:

$(A + B + C)^P = ((A+B) + C)^P$ and next simply apply Binomial Expansion to (A+B) and C.

In this case, if we consider Q = 5, and the second row from the bottom, we will see that the coefficient elements will all be multiples of 5. Then once we expand (A+B), all of these coefficients will be multiplied by the factor 5. QED.

Since the summation of A^P, B^P and C^P is supposedly zero, we may now remove the 3 corner elements from the isosceles matrix.

With the 3 Corner Values of A^P, B^P and C^P we find that all remaining elements are divisible by P, additional a careful observation of a typical binomial expansion shows that the sum of the center terms is also divisible by a + b, therefore we can now show that the expansion of $(A + B + C)^P$ has the following 4 factors:

P (A+B) (B+C) and (C+A)

Then based upon the knowledge that $(A + B + C)^P$ must have an initial value which can be raised to the P exponent to sum to $(A + B + C)^P$, we may determine that (A+B+C) must have an alternate form of:

$A + B + C = P A_1 B_1 C_1 K$

Additionally, the various presentations of A + B + C may be given a single variable designation of **D** to simplify reference to this important variable in the FLT analysis. The new variable K is an unknown integer which is related to center term residue when dividing $(A + B + C)^P$ by $P A_1 B_1 C_1$.

For the case P = 3, K is equal to 1. For higher order prime exponents the computation of K as a formula derived from A, B and C becomes more and more difficult as the exponent increases. Yet we do not need to know the exact value of K, only that it is an integer, and it should have several factors of P.

Restating:

$$D = A + B + C = P A_1 B_1 C_1 K$$

Still there are many more Presentations of D, which we will be required to be fluent in, as we forge our way to Base Camp.

Presentations of D:

Perhaps the **most important presentation of D** is as follows, thru substitution:

$$A + B + C = \frac{(A + B) + (B + C) + (A + C)}{2} = \frac{C_1^P + A_1^P + B_1^P}{-2}$$

(*Note, above form specific to SGC1*)

Although the -2 in the suffix of the far right presentation, appears out of place, it's required to be a negative. Not too hard to show that, if you go back to the beginning of the proof.

This particular form is instrumental to the final proof, since it is factorable, and after factoring new transforms are possible which lead directly to the actual proofs, which will be explored in later sections of this document.

These forms can also be expressed in relation to SGC2 as:

$$A + B + C = \frac{(A + B) + (B + C) + (A + C)}{2} = \frac{\mathbf{P}^{P-1}C_1^P + A_1^P + B_1^P}{-2}$$

It may be noted that this form is less factorable, than the form for SGC1, however $A_1^P + B_1^P$ can be factored!

And there yet remain a few more forms of D, which will be useful gear as we approach Base Camp:

$A_1^P = -(B + C)$ $\quad$ $A + (B + C) = A - A_1^P$ $\quad$ Similar substitutions for B and C arrive at:

$A + B + C = A - A_1^P = B - B_1^P = C - C_1^P$ *This form for **SGC1***

and

$A + B + C = A - A_1^P = B - B_1^P = C - \mathbf{P}^{P-1}C_1^P$ *This form for **SGC2***

At this point, I suppose it's easy to see why finding a solution to the FLT problem first using SGC1 form is sensible.

Now these last forms have a use of proving some detail about A_2, B_2 and C_2 for SGC1 as follows:

$A - A_1^P = A_1 (A_2 - A_1^{P-1})$ *Of course same considerations for B and C*

Based upon a deep intuitive understanding of Fermat's Little Theorem, we can show that:

$A^P = A \text{ Mod } P$ and less well expounded: $A^{P-1} = 1 \text{ Mod } P$
(*see my short succinct Reference paper on Extensions to Fermats's Little Theorem*.)

From the above we can prove for SGC1 that A_2, B_2 and $C_2 = 1$ Mod P, and for SGC2 if we assume C has the factor P then A_2 and B_2 = 1 Mod P and C_2 is an undefined Modulus of P.

Below lemma which shows no other possible factors between A_1 and A_2 can exist besides P.
Note, K is not the same K variable as above, it just pairs with J as an adjacent alphabetical letter. This is pulled from an earlier FLT proof written about a year ago.

T3 lemma

Binomial Expansion & Subduction of $J^P + K^P$

For the case P=5 as an example, it is given

$J^P + K^P$ Factors Into:

$$(J+K)(J^4 - J^3K + J^2K^2 - JK^3 + K^4)$$

(J+K) can not have any prime co-factor within $(J^4 - J^3K + J^2K^2 - JK^3 + K^4)$ except P as follows,

If attempting to divide J+K into $(J^4 - J^3K + J^2K^2 - JK^3 + K^4)$,

Coefficients only shown

	1	-1	1	-1	1	
Subtr $J^3(J+K)$* 1	1	1				

	0	-2				
Subtr $J^2K(J+K)$* -2		-2	-2			

		0	3			
Subt $JK^2(J+K)$* 3			3	3		

			0	-4		
Subt K3(J+K)* -4				-4	-4	

				0	5	

However it is easy to show any prime cofactors would need to exist between J+K and (*with symmetrical form*) $5J^2K^2$,

Thus $\frac{5J^2K^2}{J+K}$ would have to have these cofactors.

The only cofactor can be P (*or 5 in this case*).

J^2 and K^2 can not contain any cofactors to J+K, by reciprocity.

Such that can not have any cofactors since

it can be rewritten/understood that K is stated to be relatively prime (*coprime*) to J.

Then due to the simplicity of the subduction process:

$\frac{PJK}{J+K}$ may only have a single cofactor of P.

Thus J^P+K^P can only be factored as:

$$(J+K)\,f(J,K) \quad \text{or} \quad P^P\,(J+K)\,f(J,K)$$

With $f(J,K)$ only having a single factor of P, ergo (J+K) must have P^{P-1} as a factor.

This T3 Lemma is fundamentally written to show that there are no possible common factors between A_1, A_2, B_1, B_2, C_1 and C_2 except the possibility of a factor of P.

I coined the term “Subduction” as being Subtraction/Deduction combined.

It should be somewhat obvious from the above analysis that if $J^P + K^P$ can not have a single factor of P, since both factors of it must contain a factor of P. Of course J + K could contain multiple factors of P, but $f_A(J,K,P)$ may only contain a single factor of P.

The long division presented above, dividing J + K into $f_A(J,K,P)$, can be done from left to right, right to left or may simultaneously be approached from both left and right sides. Although it is clearly intuitively obvious that J+K can not divided into $f_A(J,K,P)$ with the exception of factor P, this Lemma drives the point home using Long Division.

My first writeup on this in my NoteBook was for the case P = 7, with the Long division approached from both left and right sides. Quite naturally, the residue was $7J^3K^3$.

Proof of Fermat’s Last Theory, applying Multidimensional Diophatine Geometry and Algebra

From the base camp, it is necessary to survey the peak of Mount Everest, cold and at an altitude which appears daunting. This Sherpa will guide you up the shortest discovered path over the last 350 years. Before leaving we must review our gear and tools, which we developed in the foundational work previously explored. Based upon an analysis of: $A^P + B^P + C^P = 0$, with P being the prime exponent >=3, our toolbox contains the following equations:

$A_1^P = -(B + C)$ $\qquad$ $B_1^P = -(A + C)$ $\qquad$ $C_1^P = -(A + B)$

$$A_2^P = f(B, C, P) = (B^{P-1} - B^{P-2}C + B^{P-3}C^2 - \ldots\ldots\ldots + B^2C^{P-3} - BC^{P-2} + C^{P-1})$$
$$B_2^P = f(A, C, P) = (A^{P-1} - A^{P-2}C + A^{P-3}C^2 - \ldots\ldots\ldots + A^2C^{P-3} - AC^{P-2} + C^{P-1})$$
$$C_2^P = f(A, B, P) = (A^{P-1} - A^{P-2}B + A^{P-3}B^2 - \ldots\ldots\ldots + A^2B^{P-3} - AB^{P-2} + B^{P-1})$$

Presentations of D

$$A + B + C = P A_1 B_1 C_1 K = \frac{(A + B) + (B + C) + (A + C)}{2} = \frac{C_1^P + A_1^P + B_1^P}{-2}$$

$$A + B + C = A - A_1^P = A_1(A_2 - A_1^{P-1}) = B - B_1^P = B_1(B_2 - B_1^{P-1}) = C - C_1^P = C_1(C_2 - C_1^{P-1})$$

Since we have packed all our gear and our oxygen tanks for the trek to the summit, the climb will now commence. If you have unwisely jumped to this departure point, without putting in the time to make yourself fit at Base Camp, please return to the Base Camp and acclimate yourself to the thin oxygen, and you may commence the climb at the next session.

A workout at Base Camp will make the above groups of equations trivial in your mind, and this is a necessary mental state to prevent oxygen deprivation and dizziness at the high altitudes we will be ascending to.

This short proof, is of a most recent vintage, and was arrived at quickly using a new method I recently refined which I refer to as Multi-Dimensional Diophantine Geometry (MDDG), basically quantifying the N= 3 case as a multidimensional jig saw puzzle, to arrive at a quantity of C^3, and the method can be directly algebraically extrapolated into higher dimensions.

Suppose was have a cube, of base dimension of C units, suppose the number of units is 100, and the cube has 1,000,000 of these smaller cubes of which it is composed.

Next, let us remove a B^3 part from C^3. We will align B^3 with the upper corner of C^3, and we will have a number of remaining shapes, one smaller cube, with a base dimension of C-B, and 6 other primatic volumes. If we algebrically expand $(X+Y)^3$, then we can understand the basis of the of the other 6 three dimensional prismatic volumes.

This smaller residue cube in the opposite corner of the B^3, will be our pivot point in our proof. Keep in mind we have these million tiny cubes and we must assemble this residue of 7 shapes, into cube A^3.

This smalle residue cube has a base dimension of C – B, well you may remember some of the Base Camp songs and rules to follow climbing Mount Everest. C – B has another representation which is A_1^3, so now things will get VERY INTERESTING!

We will consider our ruler that defines our big cube C^3, must have some unit marks on it, and since C – B is also A_1^3, I think you will agree that a good unit fsize or our ruler will be A_1. This small residue cube will be made of A_1^2 units of base dimension A_1, simple enough.

So now we need to use our metaphysical ruler with unit size of A_1, to measure the size of our Diophantine cube C^3. Hmm, we seem to have a problem here, it looks like our initial estimate of 100 base units for C is a problem, appears that C has a length which is either an arrational number (*ouch , this looks impossible*), OK so lets let C be made out of A_1 units, I wonder how many will be required to define C.

Wait a second, how can C be made of A_1 size units, that's IMPOSSIBLE, if it was possible then we would violate our initial problem definition that the variable A, B and C MUST BE coprime! Well I guess that means Fermat was right for case P=3, let's brain storm a little more, and think about some of the other cases, such as P=5, 7, 11 etcetera.

OK let's suppose we have a 5 dimensional cube shape, if we subtract B^5 from C^5, we will have some residues of 5 dimensional volumes, and the one in the opposite corner of B^5, will have a base dimension of C-B. This seems very familiar, does it not?

This C-B base dimension is algebraically alternately defined as A_1^5. And if we take our metaphysical ruler into the 5th dimension, which mas marks every A1 units, we will find that residue 5 dimensional block has a base dimension of A_1^4 units. Hey this is so simple, why didn't somebody else think of it. You tell me, send me digital communication thru cyber space to my desk computer portal.

And next step of course is that our metaphysical ruler, used in 5 dimensional space can either measure an irrational dimension as the length of C, or measure an excat diemnsion of a certin number of A1 units which define the base of C, either way you look at it, the main thing is there is no way, that for any dimension other than 2 will we find a solution, to the Fermat paradox question which stood the test of time for roughly 350 years.

Note, for the purist: Diophantine equational analysis, can not be based upon complex numbers or irrational numbers, only integers.

Identification of Solutions of Fermat's Last Theorem

Powers of P Iterative Method, Sophie Germain Case 2

Since we stipulate that one of the 3 variables A, B or C has a factor of P for the SGC2 (*Sophie Germain Case 2*) proof to FLT, the formula's below are adapted to that form. We will assume that variable C contains the factor P, and that it is distributed as follows, $\mathbf{C = P\, C_1\, C_2}$, thus:

$$A^P + B^P + C^P = 0$$

$$A_1^P = -(B + C) \qquad B_1^P = -(A + C) \qquad \mathbf{P^{P-1}}\, C_1^P = -(A + B)$$

$$A_2^P = f\,(B, C, P) = (B^{P-1} - B^{P-2}C + B^{P-3}C^2 - \ldots\ldots\ldots + B^2C^{P-3} - BC^{P-2} + C^{P-1})$$
$$B_2^P = f\,(A, C, P) = (A^{P-1} - A^{P-2}C + A^{P-3}C^2 - \ldots\ldots\ldots + A^2C^{P-3} - AC^{P-2} + C^{P-1})$$
$$\mathbf{P}\, C_2^P = f\,(A, B, P) = (A^{P-1} - A^{P-2}B + A^{P-3}B^2 - \ldots\ldots\ldots + A^2B^{P-3} - AB^{P-2} + B^{P-1})$$

$$A + B + C = P A_1 B_1 C_1 K = \frac{(A + B) + (B + C) + (A + C)}{2} = \frac{\mathbf{P^{P-1}}C_1^P + A_1^P + B_1^P}{-2}$$

Keeping in our mind the proof for SGC1 previously studied, we may recall that in the denominator of the following presentation of D we have a factor of 2. I have additionally, shown the SGC2 presentation of it to the right of it:

$$\frac{C_1^P + A_1^P + B_1^P}{-2} \qquad \frac{P^{P-1}C_1^P + A_1^P + B_1^P}{-2}$$

The factor of P, will be shown to be infinite within C_1 …...

OK, now let us proceed: $$\frac{P^{P-1}C_1^P + A_1^P + B_1^P}{-2}$$

We note that $A_1^P + B_1^P$ will be divisible by $A_1 + B_1$, and this is the first step in the proof which may be referred to as a Powers of P proof.

Next we may understand that $A_1 + B_1$ must contain the factor P. (*At this point I might suggest that any presentation use the case of P = 5, for clarity of thought. This could be written out on a classroom blackboard, whiteboard, or on a pad of paper, if you are working independently.)*

Since $A_1 + B_1$ must have a factor of P, then indeed $A_1^P + B_1^P$ divided by $A_1 + B_1$ must also contain a factor of P, as explained in our *foundational work* document on FLT, regarding SGC2.

Thus $A_1^P + B_1^P$ can not have a single factor of P, it must contain 2 factors of P at a minimum.

Note:

$A_1^{P-1} - A_1^{P-2}B_1 + A_1^{P-3}B_1^2 - \ldots\ldots\ldots + A_1^2B_1^{P-3} - A_1B_1^{P-2} + B_1^{P-1}$

will have P addend products, and will thus have a factor of P, since $A_1 = - B_1$ Mod P

A simple example of $2^5 + 3^5$ will demonstrate this 32 + 243 = 275, which is divisible by 25.

You may need to think this thru a few times before you absorb the 2 factors of P concept completely.

Since we have established now that D must contain 2 factors of P, we can look at other presentations of D as: $P A_1 B_1 C_1 K$ and $A_1A_2 + B_1B_2 + PC_1C_2$

Clearly $P A_1 B_1 C_1 K$ must necessarily contain 2 factors of P, with C_1 having one factor and P having the other factor.

However inspection of $A_1A_2 + B_1B_2 + PC_1C_2$ yields an interesting concept which is that $A_1A_2 + B_1B_2$ must also contain 2 factors of P. The significance of this is that since A_2 and B_2 must be equal to 1 Mod P which is explained in the SGC1 proof, and thus we may present the following formula:

$$A_1A_2 + B_1B_2 = (A_1 + B_1)(1 \text{ Mod } P)$$

From this equation we may observe and conclude that $A_1 + B_1$ must have 2 factors of P, in other words must have the factor $P^{2.}$,

If we iterate this new understanding into the formulaic presentation of D:

$$\frac{P^{P-1}C_1^P + A_1^P + B_1^P}{-2}$$

We now find that there are 3 factors of P present within it.

As we apply this looping iteration between the three presentations of D noted below:

$$\frac{P^{P-1}C_1^P + A_1^P + B_1^P}{-2} \qquad P A_1 B_1 C_1 K \qquad \text{and} \qquad A_1A_2 + B_1B_2 + PC_1C_2$$

We must come to the only logical conclusion, which is that we may loop Ad Infinitum, and with each loop another power of P will present itself, thus completing the proof for SGC2, using the Iterative Powers of P Method.

CLARIFICATION NOTE:
The "driving function" that makes the loop iterate, will be explained here.

The fact that $A_1^P + B_1^P$ always has an additional factor of P in the $f(A_1, B_1, P)$ factor of the $A_1^P + B_1^P$ expansion, in comparison to the formula $A_1A_2 + B_1B_2$, means that there can never be a balance in the two presentations of D, thus shifting from the one presentation and back to the other presentation of D continually advances the number of iterations of the factor P, which must ultimately present itself within the variable C_1.

<u>An Extremely Compact Speculative Proof for SGC1 and SGC2 using Non-Zero Intercept Logic</u>
April 2024

In my research over the last year, I have noted some distinct interest in the topic of unexplored math realms due to limitations of the human mind, as well as the question of if alien minds (*from other planets in the universe*) might be able to venture into these uncharted mathematical realms, which our human minds are not able to cope with. In this short exposition I will identify a proof to FLT which I feel is reasonably solid, but our earthly minds can not accept, for several reasons, which I will elaborate, before introducing you to this short and mentally stimulating proof.

I view a three space model of the human experience, in that there is reality, spirituality, and somewhere between the two mathematics. When we are absorbing and analyzing math, we are fundamentally using spacial reasoning skills developed over the last 5 million years, and not much in the way of spiritual tools. Consider our fore-bearers swinging from tree to tree in the forest. It is in this environment, that others have posited the idea that the need for extreme accuracy in flying thru space between trees honed our spacial reasoning skills to a high degree. Evolutionary forces would logically have caused brains with less well developed spacial reasoning skills to miss the landing mark on the nearby tree, fallen to the ground dead, and the result would be a gene pool with improved brain skills to develop. These improved brain reasoning skills would lead to symbolic and visual processing neural pathway improvements leading to high level language, and written symbolic processing of math, science, agriculture and various other endeavors of the human race.

If in the computation of the tree to tree jump was not done to 99.9% precision, then eventually a primate would fail to survive. Thus our gene pool evolution highly discourages risky behavior. To illustrate this concept a little more clearly consider, risk analysis of males and females. It is well understood that males are more willing to accept a risky situation than females. There is simple evolutionary rationale. If there is perhaps a 5:1 ratio of males to females and a female dies, this ends the gene pool, if on the other hand if a males dies the female can still be inseminated by a remaining male. An of course the reverse is not true, if the ratio of males to females was to be reversed. Therefore pressure from the gene pool, has caused females to be less risk tolerant, in comparison to males.

If an earthly mind with perhaps another 5 million years of evolution in a civilized society looks at a math problem, the risk assessment associated with ancient activities millions of years in the past, is far less likely to cloud their judgement. instead the spiritual analysis of deep aspects which are not easily integrated into a mathematics problem assessment may be applied with impunity. In other words a more symmetrical approach to a deep mathematics problem may be achieved using the simple reasoning skills associated with spacial reasoning as well as the more convoluted reasoning skills associated with the spiritual realm.

Let us consider the math professor, who has looked at the soon to be introduced compact proof to FLT, and determined that the proof appears to be reasonable, but that introducing a proof that relies on very abstract realms of thought is likely to be scoffed at by contemporaries and then this professor's credibility and social standing within the tribe would likely be depreciated. Unacceptable risk/reward ratio.

This particular proof has likely been promoted on the web, from several individuals, I have read proofs which appear to have some structural similarity to the one I will introduce you to. Often times, a clue will be that a simple proof will have in the end steps an irrational number, a root of two, related to the value of exponent P. If you who are reading this have written such a proof some time ago, and posted it to the web (*or not*), I would certainly be interested in your exposition of the proof, please email me with your proof.

The abstraction proof, difficult to hold in your mind below:

$A^5 + B^5 = C^5$ can be factored in several ways, from instance $(C – B) (C^4 + C^3B + C^2B^2 + CB^3 + C^4)$ is one of the three ways it can be factored, as elaborated in Base Camp. And note C-B and $C^4 + C^3B + C^2B^2 + CB^3 + C^4$ are coprime, and thus $C\text{-}B = A_1^5$ and $A_2^5 = C^4 + C^3B + C^2B^2 + CB^3 + C^4$

If there is a non-trivial solution and we multiply the 3 variables A, B and C times integer 2, based upon our normal algebraic rules of manipulation, we will have another solution to FLT, albeit with non-coprime factors.

We could write then $2^5(A^5 + B^5 - C^5) = 0$, also $(2A)^5 + (2B)^5 - (2C)^5 = 0$

With this second right side form, let us see what happens when we factor the equation.

$(2C – 2B) (2^4C^4 + 2^4C^3B + 2^4C^2B^2 + 2^4CB^3 + 2^4C^4)$

We can not longer show $2C – 2B = A_1^5$ and $2^4C^4 + 2^4C^3B + 2^4C^2B^2 + 2^4CB^3 + 2^4C^4 = A_2^5$

Our previous integer values for A_1^5 have become an irrational root of 2, and the same can be said of $A_2^{5.}$

But if we consider the Pythagorean version of FLT, $A^2 + B^2 = C^{2,}$ we will quickly realize that adding a 2^2 factor multiplier allows for

the C-B factor and the C+B factor to take on a single value of 2^1, which supports the validity of this simple proof.

When analyzing this proof briefly, looking at it from the corner of our minds eye, it appears conceptually well developed, but further inspection causes us to doubt our mathematical senses, which have the origin in the trees, and require a 99.9% solidity to any proof we analyze. Our scientific mind derives from our earthly experience, but earthly experience is not driving the mathematical mind entirely, there is also a tiny spiritual aspect to it. This realm and aspect of mathematical proofs are not easily explored. Perhaps proofs such as the one just introduced of this nebulous nature, are worthy in this regard.

My choice of the method descriptive name (*Non-Zero Intercept*) is very abstract, and can not be put into words unfortunately. In my humble opinion, an alien civilization would accept this nebulous proof as valid, (*fundamentally due to the symmetry*).
One of the additional developments in the proof would be the recognition that if the multiplier is 2^5 rather than simply 2, it would be easy to prove that an infinite number of integer possibilities would exist as non-trivial solutions, however there would be infinity squared non-trivial solutions with irrational values for A, B and C. and suppose we divide infinity by infinity squared, well this is simply zero. Abstract logic, maybe of alien origin?

From this intellectual vantage point, we might even consider a postulate for FLT I thought of earlier tonite, which is:

There could not be a single non-trivial, non-infinite, coprime solution to FLT. It is a result of the symmetry, that there would fundamentally have to be an infinite number of solutions. And this posit, applies to a great deal of math, where symmetry exists in the basic exposition of the problem.

In a way, it is a most beautiful organic solution to the FLT problem. Please accept my apologies in advance for this highly speculative introspection of the space between the reality and spiritual realms, which is mathematics.

ADDENDUM

-A- STATEMENTS of EXPANSIONS of FERMAT'S LITTLE THEOREM:

$A^P = A \text{ Mod } P$, is a typical way of writing Fermat's Little Theorem, it therefore thru induction it holds that $A^{P-1} = 1 \text{ Mod } P$.
And now since $A^0 = 1 \text{ Mod } P$ and $A^{P-1} = 1 \text{ Mod } P$, we can determine the periodicity which is P-1, thus we may write

$$A^{K(P-1)+1} = A \text{ Mod } P$$

If we look at a simplified case of P = 5, we can understand that A Mod P will occur at N = 0, 5, 9, 13, 17 … as K is incremented. The best way to attain great clarity of this concept is to observe some "output" from a few Libre Office worksheets, presented below:

Modulus of Prime Number 3
Periodicity is 3 - 1

N = 13	0	**1**	**2**
N = 12	0	1	1
N = 11	0	**1**	**2**
N = 10	0	1	1
N = 9	0	**1**	**2**
N = 8	0	1	1
N = 7	0	**1**	**2**
N = 6	0	1	1
N = 5	0	**1**	**2**
N = 4	0	1	1
N = 3	0	**1**	**2**
N = 2	0	1	1
N = 1	0	**1**	**2**
N = 0	0	1	1

Modulus of Prime Number 5
Periodicity is 5 - 1

N = 13	0	**1**	**2**	**3**	**4**
N = 12	0	1	1	1	1
N = 11	0	1	3	2	4
N = 10	0	1	4	4	1
N = 9	0	**1**	**2**	**3**	**4**
N = 8	0	1	1	1	1
N = 7	0	1	3	2	4
N = 6	0	1	4	4	1
N = 5	0	**1**	**2**	**3**	**4**
N = 4	0	1	1	1	1
N = 3	0	1	3	2	4
N = 2	0	1	4	4	1
N = 1	0	**1**	**2**	**3**	**4**
N = 0	0	1	1	1	1

Modulus of Prime Number 7
Periodicity is 7 - 1

N = 13	0	**1**	**2**	**3**	**4**	**5**	**6**
N = 12	0	1	1	1	1	1	1
N = 11	0	1	4	5	2	3	6
N = 10	0	1	2	4	4	2	1
N = 9	0	1	1	6	1	6	6
N = 8	0	1	4	2	2	4	1
N = 7	0	**1**	**2**	**3**	**4**	**5**	**6**
N = 6	0	1	1	1	1	1	1
N = 5	0	1	4	5	2	3	6
N = 4	0	1	2	4	4	2	1
N = 3	0	1	1	6	1	6	6
N = 2	0	1	4	2	2	4	1
N = 1	0	**1**	**2**	**3**	**4**	**5**	**6**
N = 0	0	1	1	1	1	1	1

Modulus of Prime Number 11

Periodicity is 11 - 1

N = 21	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
N = 20	0	1	1	1	1	1	1	1	1	1	1
N = 19	0	1	6	4	3	9	2	8	7	5	10
N = 18	0	1	3	5	9	4	4	9	5	3	1
N = 17	0	1	7	9	5	3	8	6	2	4	10
N = 16	0	1	9	3	4	5	5	4	3	9	1
N = 15	0	1	10	1	1	1	10	10	10	1	10
N = 14	0	1	5	4	3	9	9	3	4	5	1
N = 13	0	1	8	5	9	4	7	2	6	3	10
N = 12	0	1	4	9	5	3	3	5	9	4	1
N = 11	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
N = 10	0	1	1	1	1	1	1	1	1	1	1
N = 9	0	1	6	4	3	9	2	8	7	5	10
N = 8	0	1	3	5	9	4	4	9	5	3	1
N = 7	0	1	7	9	5	3	8	6	2	4	10
N = 6	0	1	9	3	4	5	5	4	3	9	1
N = 5	0	1	10	1	1	1	10	10	10	1	10
N = 4	0	1	5	4	3	9	9	3	4	5	1
N = 3	0	1	8	5	9	4	7	2	6	3	10
N = 2	0	1	4	9	5	3	3	5	9	4	1
N = 1	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
N = 0	0	1	1	1	1	1	1	1	1	1	1

Modulus of Prime Number 13

Periodicity is 13 - 1

N = 25	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
N = 24	0	1	1	1	1	1	1	1	1	1	1	1	1
N = 23	0	1	7	9	10	8	11	2	5	3	4	6	12
N = 22	0	1	10	3	9	12	4	4	12	9	3	10	1
N = 21	0	1	5	1	12	5	5	8	8	1	12	8	12
N = 20	0	1	9	9	3	1	3	3	1	3	9	9	1
N = 19	0	1	11	3	4	8	7	6	5	9	10	2	12
N = 18	0	1	12	1	1	12	12	12	12	1	1	12	1
N = 17	0	1	6	9	10	5	2	11	8	3	4	7	12
N = 16	0	1	3	3	9	1	9	9	1	9	3	3	1
N = 15	0	1	8	1	12	8	8	5	5	1	12	5	12
N = 14	0	1	4	9	3	12	10	10	12	3	9	4	1
N = 13	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
N = 12	0	1	1	1	1	1	1	1	1	1	1	1	1
N = 11	0	1	7	9	10	8	11	2	5	3	4	6	12
N = 10	0	1	10	3	9	12	4	4	12	9	3	10	1
N = 9	0	1	5	1	12	5	5	8	8	1	12	8	12
N = 8	0	1	9	9	3	1	3	3	1	3	9	9	1
N = 7	0	1	11	3	4	8	7	6	5	9	10	2	12
N = 6	0	1	12	1	1	12	12	12	12	1	1	12	1
N = 5	0	1	6	9	10	5	2	11	8	3	4	7	12
N = 4	0	1	3	3	9	1	9	9	1	9	3	3	1
N = 3	0	1	8	1	12	8	8	5	5	1	12	5	12
N = 2	0	1	4	9	3	12	10	10	12	3	9	4	1
N = 1	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
N = 0	0	1	1	1	1	1	1	1	1	1	1	1	1

Now Let’s consider the composite number 5 x 7 = 35

You may note that periodicity is the lowest common denominator of 5-1 and 7-1, which is 12. And that for the 12th and 24th rows that the Modulus of 35 is only **1** if the input parameter **A** is coprime to both 5 and 7.

N																																			
37	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**																										
36	1	1	1	1	15	1	21	1	1																										
35	1	18	12	9	10	6	28	22	4																										
34	1	9	4	11	30	1	14	29	16																										
33	1	22	13	29	20	6	7	8	29																										
32	1	11	16	16	25	1	21	1	11																										
31	1	23	17	4	5	6	28	22	9																										
30	1	29	29	1	15	1	14	29	1																										
29	1	32	33	9	10	6	7	8	4																										
28	1	16	11	11	30	1	21	1	16																										
27	1	8	27	29	20	6	28	22	29																										
26	1	4	9	16	25	1	14	29	11																										
25	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**0**
24	1	1	1	1	15	1	21	1	1	15	1	1	1	21	15	1	1	1	1	15	21	1	1	1	15	1	1	21	1	15	1	1	1	1	0
23	1	18	12	9	10	6	28	22	4	5	16	3	27	14	15	11	33	2	24	20	21	8	32	19	30	31	13	7	29	25	26	23	17	34	0
22	1	9	4	11	30	1	14	29	16	25	11	9	29	21	15	16	4	4	16	15	21	29	9	11	25	16	29	14	1	30	11	4	9	1	0
21	1	22	13	29	20	6	7	8	29	20	1	27	13	14	15	1	27	8	34	20	21	22	8	34	15	6	27	28	29	15	6	22	13	34	0
20	1	11	16	16	25	1	21	1	11	30	16	11	1	21	15	11	16	16	11	15	21	1	11	16	30	11	1	21	1	25	16	16	11	1	0
19	1	23	17	4	5	6	28	22	9	10	11	33	27	14	15	16	3	32	19	20	21	8	2	24	25	26	13	7	29	30	31	18	12	34	0
18	1	29	29	1	15	1	14	29	1	15	1	29	29	21	15	1	29	29	1	15	21	29	29	1	15	1	29	14	1	15	1	29	29	1	0
17	1	32	33	9	10	6	7	8	4	5	16	17	13	14	15	11	12	23	24	20	21	22	18	19	30	31	27	28	29	25	26	2	3	34	0
16	1	16	11	11	30	1	21	1	16	25	11	16	1	21	15	16	11	11	16	15	21	1	16	11	25	16	1	21	1	30	11	11	16	1	0
15	1	8	27	29	20	6	28	22	29	20	1	13	27	14	15	1	13	22	34	20	21	8	22	34	15	6	13	7	29	15	6	8	27	34	0
14	1	4	9	16	25	1	14	29	11	30	16	4	29	21	15	11	9	9	11	15	21	29	4	16	30	11	29	14	1	25	16	9	4	1	0
13	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**0**
12	1	1	1	1	15	1	21	1	1	15	1	1	1	21	15	1	1	1	1	15	21	1	1	1	15	1	1	21	1	15	1	1	1	1	0
11	1	18	12	9	10	6	28	22	4	5	16	3	27	14	15	11	33	2	24	20	21	8	32	19	30	31	13	7	29	25	26	23	17	34	0
10	1	9	4	11	30	1	14	29	16	25	11	9	29	21	15	16	4	4	16	15	21	29	9	11	25	16	29	14	1	30	11	4	9	1	0
9	1	22	13	29	20	6	7	8	29	20	1	27	13	14	15	1	27	8	34	20	21	22	8	34	15	6	27	28	29	15	6	22	13	34	0
8	1	11	16	16	25	1	21	1	11	30	16	11	1	21	15	11	16	16	11	15	21	1	11	16	30	11	1	21	1	25	16	16	11	1	0
7	1	23	17	4	5	6	28	22	9	10	11	33	27	14	15	16	3	32	19	20	21	8	2	24	25	26	13	7	29	30	31	18	12	34	0
6	1	29	29	1	15	1	14	29	1	15	1	29	29	21	15	1	29	29	1	15	21	29	29	1	15	1	29	14	1	15	1	29	29	1	0
5	1	32	33	9	10	6	7	8	4	5	16	17	13	14	15	11	12	23	24	20	21	22	18	19	30	31	27	28	29	25	26	2	3	34	0
4	1	16	11	11	30	1	21	1	16	25	11	16	1	21	15	16	11	11	16	15	21	1	16	11	25	16	1	21	1	30	11	11	16	1	0

3	1	8	27	29	20	6	28	22	29	20	1	13	27	14	15	1	13	22	34	20	21	8	22	34	15	6	13	7	29	15	6	8	27	34	0
2	1	4	9	16	25	1	14	29	11	30	16	4	29	21	15	11	9	9	11	15	21	29	4	16	30	11	29	14	1	25	16	9	4	1	0
1	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
N																																			

It's quite mind numbing I suppose. But we can understand the basics of Composite number Exponential Modulus when simply inspecting the above table, and we can thru induction state the extend these concepts to other composite scenarios.

-B- NSF (*Non-Symmetrical Form*) Reference Structural Formulas for Future Reference

Since you may wish to convert this proof from the Symmetrical Form to the more typical Non-Symmetrical Form of FLT, which is $A^P + B^P = C^P$, the fundamental equations are rewritten below for the Non-Symmetrical Form.

$A_1^P = (C - B)$ $B_1^P = (C - A)$ $C_1^P = (A + B)$

f_S *is the* ***S****ubtractive function for the factors of* A_2 *and* B_2
f_A *is the* ***A****dditive function for the factors of* C_2

$$A_2^P = f_S\,(C, B, P) = (B^{P-1} + B^{P-2}C + B^{P-3}C^2 + \ldots\ldots\ldots + B^2C^{P-3} + BC^{P-2} + C^{P-1})$$
$$B_2^P = f_S\,(C, A, P) = (A^{P-1} + A^{P-2}C + A^{P-3}C^2 + \ldots\ldots\ldots + A^2C^{P-3} + AC^{P-2} + C^{P-1})$$
$$C_2^P = f_A\,(A, B, P) = (A^{P-1} - A^{P-2}B + A^{P-3}B^2 - \ldots\ldots\ldots + A^2B^{P-3} - AB^{P-2} + B^{P-1})$$

Presentations of D

$$A + B - C = P\,A_1\,B_1\,C_1\,K = \frac{(A + B) - (C - B) - (C - A)}{2} = \frac{A_1^P + B_1^P - C_1^P}{-2}$$

$$A + B - C = A - A_1^P = A_1(A_2 - A_1^{P-1}) = B - B_1^P = B_1(B_2 - B_1^{P-1}) = C_1^P - C = C_1(C_1^{P-1} - C)$$

-C- Suggested Reading (pending)

-D- For the near future, I may be contacted by email at: D.Ross.Randolph345@Gmail.com Feel free to establish contact.

-E- Epilogue (pending)