Proof of Fermat's Last Theorem in Five Lines

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In the following discussion, all elements $x \in \mathbb{R}$ are positive definite: ($x = [sqr(x)]^2 = |x|$, so that $x > 0$), and the positive integers $\{|a|\} \ni |\mathbb{Z}|$ are a subset of the positive real numbers: $|\mathbb{Z}| \in |\mathbb{R}|$

Prime Numbers (added 11/01/2019)

(Note (added 11/14/2019):

The expression $L = a^2 + b^2 (= 2ab = 2N)$ is not an example of Fermat's expression, since L is first order ($1_L = \log_L(L)$) and the elements on the rhs are second order (e.g. $2_a = \log_a(a^2)$.

(Edit: corrected previous version in which I said Fermat expression was valid for n=2 in this case. Mind fart, sorry 'bout that)

In general, however, the expression $ab = \frac{1}{2}\left[c^2 - (a^2 + b^2\right]$ can be taken as a definition of multiplication of positive integers where:

$c = a + b$ is the metric of a Presburger arithmetic.

$c^2 = a^2 + b^2 + 2ab$ (equating Binomial Expansion to a single valued result for $n = 2$.

And $c^2 = \{0\}$ implies the equality $a^2 + b^2 = 2ab$ for a and b first order, and a^2 and b^2 second order, and the product $ab = \frac{L}{2} = N$ also unique as a product of primes by the Fundamental Theorem of Arithmetic.

The (3,4,5) right triangle

Consider the relation:

$49 = (3)^2 + (4)^2 + (2)(3)(4) = (25) + (24)$

versus the Pythagorean $(3,4,5)$ triple:

$25 \;=\; (3+i4)(3-i4)$ (using complex conjugates)

The Missing Area

$A = \left(\frac{1}{2}\right)(3*4) = 6$ is the area of the $(3,4,5)$ triangle in a single quadrant of the (my?) Relativistic Unit Circle (RUC), so for all four quadrants the total area is multiplied by 4, giving $4(A) = 24$, where $49 = A + 25 = 24 \; + \; 25$ without complex conjugation. The "area" is what holds the triangle together; if it is not included the legs of the triangle are not connected (affine), since the equation $25 \;=\; (3+i4)(3-i4)$) "true" (but imaginary) without the legs being connected at all.

Note: “Imaginary numbers are complex only for those that think they are somehow real.” – C. Keyser

This result is an example of the proof of Fermat's last theorem which includes the case $n=2$. It is then expanded easily for $n>2$ by induction by setting the Binomial Expansion equal to its integer result:

$c^n=(a+b)^n=a^n+b^n+\mathrm{Re}\,m(a,b,n)$, where $\mathrm{Re}\,m(a,b,n)$ consists solely of sums of products (of powers) of each of the elements (a,b)

Note: by my proof of Goldbach's conjecture, a and b are prime numbers relative to their unit base, but c is not a prime number; the equality derives from the Fundamental Theorem of Arithmetic relative to their common unit base ($a \triangleq a_1 * (1)$), where:

$1_1=\log_1(1)$, $(n)1_1=\log_1(1^n)$, and $(n)1_a=\log_a(1^n)$

For prime numbers (defined for all bases) and $c=a+b$

$1_c=1_{(a+b)}=\log_{(a+b)}(a+b)\neq 1_a+1_b=\log_a(a)+\log_b(b)$

For $c=c=a=L=L$,

by Goldbach's conjecture

$L=L=p_1+p_2=2p_1p_2=2N$

and the Fundamental Theorem of Arithmetic, c must be even (and not prime), and a and b must be prime numbers where:

$c=L=a+b=2ab=2N$; that is,

$c=L=p_1+p_2=2p_1p_2=2N$,

$1_{p_1}+1_{p_2}=2\left(1_{p_1p_2}\right)=2\left(1_N\right)$,

$1_{(p_1+p_2)}=\log_{(p_1+p_2)}(p_1+p_2)=\log_{2p_1p_2}(2p_1p_2)=1_{(2p_1p_2)}$

i.e., $\log_L(L)=\log_{(p_1+p_2)}(p_1+p_2)=\log_{(2p_1p_2)}(2p_1p_2)=\log_{(2N)}(2N)$,

$n_{(a+b)}=n*1_{(a+b)}=\log_{(a+b)}(a+b)^{n_{(a+b)}}=\log_c(c)^{n_{(a+b)}}=\log_L(L)^{n_{(a+b)}}=\log_{(2N)}(2N)^{n_{(2N)}}$, etc.

where red indicates prime numbers under addition, and blue indicates prime numbers under multiplication)

Newton's extension of the Binomial Expansion

In particular, this means that Newton's extension of the proof of the Binomial Theorem from $|\mathbb{Z}|$ to $|\mathbb{R}|$ is not correct if the result is included, unless the unit base is taken to be infinitesimal $(c\tau)\to 0$ as the limit as the "perturbation" $(v\tau')\to\infty$ in the RUC. This is the "relativistic" limit of continuity, where if the base is small enough, changes to the base $(c\tau')$ become infinitesimal (that is, the RUC is a the characterization of the change from an initial state $(c\tau)$ to a final state $(c\tau')$ via the perturbation $(v\tau')$. It is important to note that the spacetime "metrics" ($r = vt$ and/or $x = vt$) is not included in this characterization"

$$\begin{aligned}(c\tau') &= (c\tau) + (v\tau') \\ (c\tau')^2 &= (c\tau)^2 + (v\tau')^2 + 2(c\tau)\end{aligned}.$$

Special Relativity

The Lorentz factor that characterizes Special Relativity is derived from the solution for τ' of the equation

$$\begin{aligned}\psi &= (c\tau) + i(v\tau') \\ \psi\psi^* &= (c\tau')^2 = (c\tau)^2 + (v\tau')^2\end{aligned}$$

That is,

$(c\tau') = (c\tau)(\gamma_{\_L})$, where $(\gamma_{\_L}) = \dfrac{1}{\sqrt{1-\beta^2}}$, $\beta = \dfrac{v}{c}$.

(There is much more to be said about this via the RUC and the rest of mathematical physics, but I don't have space to write it here. That said, the context of this paper is that Fermat's Theorem is to be proved for positive integers, so we must soldier on.)

Proof of Fermat's Last Theorem in Five (5) Lines

Case ($\mathbf{n} = \mathbf{2}$) (Five Lines)

1. $c = a + b$
2. $c^2 = (a+b)^2 = a^2 + b^2 + 2ab = a^2 + b^2 + Rem(a,b,2)$ from the Binomial Expansion for $n = 2$
3. $c^2 = a^2 + b^2 \Leftrightarrow Rem(a,b,2) = 0$
4. $\left[Rem(a,b,2) \ = \ 2ab\right] \ > \ 0$
5. $c^2 \neq a^2 + b^2$

Q.E.D. (for $n = 2$)

Case ($\mathbf{n} > \mathbf{2}$) (Five Lines)

1. $c = a + b$
2. $c^n = a^n + b^n + rem(a,b,n)$ by Binomial expansion set equal to a single valued integer.
3. $c^n = a^n + b^n \Leftrightarrow rem(a,b,n) = 0$
4. $rem\left(a,b,n\right) > 0$
5. $c^n \neq a^n + b^n$

Q.E.D. (for $n > 2$)

The General Theory of Relativity (Einstein)

Einstein's GTR is an attempt to describe gravity in terms of analogy with Maxwell's derivation of c using curved surfaces (but not volumes)

However, the trace of the metric tensor (diagonal) is actually a sum of prime numbers, which is equal to twice the product by virtue of "my" proof of Goldbach's conjecture via considerations of "relativitisic" interaction and the Fundamental Theorem of arithmetic (showing equality of set elements under addition and (twice) multiplication.

But, hey, that's just me....