Summary of Proof of Fermat's Theorem

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Relativistic Unit Circle (reference)

Pythagorean Triples

$c^2 = a^2 + b^2$ can only be integers if they are on the same number line (in the same dimension), so that $c^2\vec{i} = a^2\vec{i} + b^2\vec{i} = (a^2 + b^2)\vec{i}$ so that the left and right sides of the equality refer to the same unique integer (i.e., a tautology). Pythagorean triples exist as a result of the base of the number system chosen (i.e., the method of counting and partitioning the same set of positive elements), in which tne integers represented by a and b do not interact (i.e., the sum is a result of counting unique elements in a set).

Then $c^n = a^n + b^n + rem(a,b,n)$ can only be integers if both sides of the equation refer to the same unique number: $c^n\vec{i} = a^n\vec{i} + b^n\vec{i} + rem(a,b,n)\vec{i} = \left[a^n + b^n + rem(a,b,n)\right]\vec{i}$ where the lhs and rhs refer to the same unique number c , so the relationship is again a tautology, as is $d^n\vec{i} = a^n\vec{i} + b^n\vec{i} = \left(a^n + b^n\right)\vec{i}$.

Even so, $c^n = d^n$ only if $rem(a,b,n) = 0$, (i.e. either $a = 0$ or $b = 0$) QED

Vector Analysis

In a single dimension $\vec{i}$, for a a variable over the integers in that dimension, $a^0, a^1, a^2, a^3 ....., a^p$ ($a^0\vec{i} = 1\vec{i} = \vec{i},\ a^1 = a\vec{i}$) are all integers in that dimension, and the arithmetic properties for integers are consistent in that dimension. That is, any function $f(a)$ consisting of only positive integers of a will also be in that dimension, which can be represent by the set $\{A\}$, so that $a \in \{A\} \Leftrightarrow f(a) \in \{A\}$; in particular $p_a a^p = a' \in \{A\} \Leftrightarrow p_a \in \{A\}$ for p_a and a' positive integers.

The same condition applies to an independent dimension $\vec{j}$ for b a variable of the integers in that dimension, represented by the disjoint set $\{B\}$; $\left(b^0, b^1, b^2, b^3 ....., b^q\right) \in \{B\} \Leftrightarrow g(b) \in \{B\}$

The disjoint sets can then be represented by variables over the sets in the two dimensional (orthogonal) vector space $(a,b) \Leftrightarrow (f(a), g(b))$; that is $f(a) \perp g(b)$.

For $a=\sqrt{a^2}$ and $b=\sqrt{b^2}$, the relation $c\vec{r}=a\vec{i}+b\vec{j}$ represents the vector relation between the two independent variables (a,b) so that $c^2=a^2+b^2$

Consider the relation $c\vec{r}=(a\vec{i}+b\vec{j})(a\vec{i}+b\vec{j})=a^2\vec{i}+b^2\vec{j}+ba(j\otimes i)+ab(i\otimes j)$

Here, the vector cross products change sign when reversed, which affects the vectors but not the coefficients (which commute), so that

$c\vec{r}=a^2\vec{i}+b^2\vec{j}+ba(-\vec{k})+ab(\vec{k})=a^2\vec{i}+b^2\vec{j}+2ab(\vec{0})$, where the null vector $(\vec{0})$ represents equal and opposite interactions at the connected origin of a and b , since $a^2(\vec{0})=a_a a_b(\vec{0})=a_a\vec{i}\otimes a_b\vec{j}+a_b\vec{i}\otimes\overrightarrow{a_a j}$ for $a_a\in\{A\}$ and $a_b\in\{B\}$ (i.e., equal scalar coefficients in the disjoint sets. Note that it is a requirement for products of positive integers that their terms commute.

That is, $c^2(\vec{0})=a^2(\vec{0})+b^2(\vec{0})+2ab(\vec{0})$, so that $c^2=a^2+b^2+2ab$ where $2ab$ represents an equal and opposite positive interaction term with elements from both dimensions.

Then $c^2(\vec{0})=(a+b)^2(\vec{0})=\left[a^2+b^2+2ab\right](\vec{0})$

The Binomial Expansion for the case $n=2$ can be represented by $c^2=a^2+b^2+rem(a,b,2)$ where $rem(a,b,2)$ represents the positive remainder term, where the multiplier (2) of the interaction term ab is the Pascal Coefficient for that case of n . In particular, note that $c^2=a^2+b^2$ only if $rem(a,b,2)=0$ as coefficients of the null vector where the scalars a and b commute.

The Binomial Expansion can then be extended to the general case $c^n=(a+b)^2(a+b)^{(n-2)}=(a+b)^n=a^n+b^n+2ab\left[rem(a,b,n-2)\right]$, where $2ab\left[rem(a,b,n-2)\right]$ consists of all terms in the expansion that are not a^n or b^n. Then $c^n=a^n+b^n$ only if $2ab\left[rem(a,b,n-2)\right]=0$, which can only be true if either $a=0$ or $b=0$, since all terms in $\left[rem(a,b,n-2)\right]$ consists of products of powers of a and b multiplied by Pascal's coefficient for that particular case of n

Since both $a>0$ and $b>0$ are assumed for Fermat's Theorem, this contradicts the hypothesis that $c^n=a^n+b^n$.

QED

Relativity

This section needs revision. See The Relativistic Unit Circle for updates..

The analysis works exactly the same way, where a and b are replaced by γ and β (since they are orthogonal within the Relativistic Unit Circle), so that

$\psi^n = \gamma^n + \beta^n + rem(\gamma, \beta, n)$, where ψ^n can only be an integer if $\beta = 0$

(Note that $\gamma = \cos\theta$ and $\beta = \sin\theta$ in the relativistic unit circle, so that $\psi^2 = \cos^2\theta + \sin^2\theta = 1^2$. Therefore, $\gamma < 1$ and $\beta < 1$ cannot be integers.

In the case $\psi^n = (\gamma + \beta)^n = \gamma^n + \beta^n + rem(\gamma, \beta, n)$, $rem(\gamma, \beta, n)$ represents interaction energy in sums of terms where each of the terms represent products such as $P\cos^p\theta\sin^q\theta$ where P is the (positive integer) coefficient for that term. The interaction term only vanishes for $\theta = 0$ (one dimension).

The interaction term $rem(\gamma, \beta, n)$ corresponds to various powers of spin polarization of interacting photons (or photo-equivalent electrons) in Quantum Field Theory…