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THE PROOF OF THE FERMAT-BEAL THEOREM

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Abstract: The proof of The Beal's Conjecture.

I.INTRODUCTION

The famous Fermat's Last Theorem (FLT) assertion that fo[illegible] $x \in \{3,4[illegible]\}$ and for all $X, Y, Z \in \{1,2,3, \ldots\}$: $X^x + Y^x \neq Z^x \in 1$.
It is easy to see that if $X^x + Y^x = Z^x$ then either $X, Y,$ [illegible] Z are co[illegible]ime or, if not co-prime that any common factor could be divided out of each te[illegible]n until the equati[illegible]n existed with co-prime bases. (Co-prime is synonymous with pairwise relativ[illegible]y prime an[illegible] means that in a given set of numbers, no two of the numbers share a common factor[illegible]
You could then restate FLT by saying th[illegible] $X^x +$ [illegible] Z^x is impossible with co-prime bases. (Yes, it is also impossible without c[illegible] bases, but non co-prime bases can only exist as a consequence of co-prime bases). [1]

II. THE FERMAT-BEAL THEO[illegible]

Theoreme (Fermat- Beal Theo[illegible]n) [illegible] $\in \{3,4,5, \ldots\}$ the equation $A^x + B^y = C^z$ has no primitive solutions i[illegible] $\{1,2,3, \ldots\}$[illegible]
Proof. Suppose that for [illegible]om[illegible] $x, y, z \in \{3,$[illegible]$5, \ldots\}$ the equation
$A^x + B^y = C^z$
has primitive solut[illegible]ons in $\{1,2,3,$ [illegible]
Thus for some [illegible] y, z [illegible]$\{3,4,5, \ldots\}$ and for some coprime $A, B, C \in \{1,2,3, \ldots\}$ and for some coprime $a, b, c \in \{1,2,3, \ldots\}$ [illegible]n that o[illegible]ly one number out of (A, B, C) is even :

$$\{\left[A^x + \left(B^{\frac{y}{x}}\right)^x = \left(C^{\cdots}\right)^x \wedge x \mid y,z \ [illegible] \neq z\right] \vee$$

$$\left[\left(A^{\frac{x}{y}}\right)^y + B \ [illegible] \left(\cdots \right) \ [illegible] z \wedge x \neq z\right] \vee$$

$$\left[\left(A^{\frac{x}{z}}\right)^z + \left(B^{\frac{y}{z}}\right)^z = C \ [illegible] \ z \mid x,y \wedge x \neq y\right] \vee$$

$$[A^x + B^x = C^x \wedge x = y = z] \vee$$

$$[A^x + \left(B^{\frac{y}{x}}\right)^x = \left(C^{\frac{z}{x}}\right)^x \wedge x \nmid y,z \wedge b^x = B \wedge c^x = C \wedge$$

$$A^x + (b^y)^x = (c^z)^x \wedge \gcd(A,b) = \gcd(A,c) = 1] \vee$$

$$[\left(A^{\frac{x}{y}}\right)^y + B^y = \left(C^{\frac{z}{y}}\right)^y \wedge y \nmid x,z \wedge a^y = A \wedge c^y = C \wedge$$

$$(a^x)^y + B^y = (c^z)^y \wedge \gcd(a,B) = \gcd(B,c) = 1] \vee$$

$$[\left(A^{\frac{x}{z}}\right)^z + \left(B^{\frac{y}{z}}\right)^z = C^z \wedge z \nmid x,y \wedge a^z = A \wedge b^z = B \wedge$$

$(a^x)^z + (b^y)^z = C^z \wedge \gcd(a,C) = \gcd(b,C) = 1] \vee$

$[A^x + \left(B^{\frac{y}{x}}\right)^x = \left(C^{\frac{z}{x}}\right)^x \wedge x \mid y \wedge x \nmid z \wedge y \neq z \wedge c^x = C \wedge$

$A^x + \left(B^{\frac{y}{x}}\right)^x = (c^x)^x \wedge \gcd(A,c) = \gcd(B,c) = 1] \vee$

$[A^x + \left(B^{\frac{y}{x}}\right)^x = \left(C^{\frac{z}{x}}\right)^x \wedge x \mid z \wedge x \nmid y \wedge y \neq z \wedge b^x = B \wedge$

$A^x + (b^y)^x = \left(C^{\frac{z}{x}}\right)^x \wedge \gcd(A,b) = \gcd(b,C) = 1] \vee$

$[\left(A^{\frac{x}{y}}\right)^y + B^y = \left(C^{\frac{z}{y}}\right)^y \wedge y \mid x \wedge y \nmid z \wedge x \neq z \wedge c^y = C \wedge$

$\left(A^{\frac{x}{y}}\right)^y + B^y = (c^z)^y \wedge \gcd(A,c) = \gcd(B,c) = 1] \vee$

$[\left(A^{\frac{x}{y}}\right)^y + B^y = \left(C^{\frac{z}{y}}\right)^y \wedge y \mid z \wedge y \nmid x \wedge x \neq z \wedge a^y = A \wedge$

$(a^x)^y + B^y = \left(C^{\frac{z}{y}}\right)^y \wedge \gcd(a,B) = \gcd(a,C) = 1] \vee$

$[\left(A^{\frac{x}{z}}\right)^z + \left(B^{\frac{y}{z}}\right)^z = C^z \wedge z \mid x \wedge z \nmid y \wedge x \neq y \wedge b^z = B \wedge$

$\left(A^{\frac{x}{z}}\right)^z + (b^y)^z = C^z \wedge \gcd(A,b) = \gcd(b,C) = 1] \vee$

$[\left(A^{\frac{x}{z}}\right)^z + \left(B^{\frac{y}{z}}\right)^z = C^z \wedge z \mid y \wedge z \nmid x \wedge x \neq y \wedge a^z = A \wedge$

$(a^x)^z + \left(B^{\frac{y}{z}}\right)^z = C^z \wedge \gcd(a,B) = \gcd(a,C) = 1]\}$,

which is false because FLT is true. ♠

The Last Case For some $x, y, z \in \{3,4,5, \dots\}$ and for some coprime $X, Y, Z \in \{1,2,3, \dots\}$ and for some coprime $a, b, c \in \{1,2,3, \dots\}$ such that only one number out of (a,b,c) even :

$[(X = a^x \wedge Y = b^y \wedge Z = c^z \wedge a^{xx} + b^{xy} = c^{xz} \equiv 0)$ [illegible]

Thus for some $x, y, z \in \{3,4,5, \dots\}$ and for some coprime $a, b, c \in \{1,2,3, \dots\}$ and for some coprime $A, B, C \in \{1,2,3, \dots\}$ such that only one number out of (A,B,C) is even:

$[(a^{xx} + b^{xy} = c^{xz} = A^x + B^y = C^z \equiv 0 \wedge a^x = A \wedge b^y = B \wedge c^z = C) \in 0]$,

inasmuch as the Fermat Equation is false. This is the proof.

REFERENCES

[1] http://www.bealconjecture.com

[2] Guła, [illegible] W.: http://www.ijetae.com/files/Volume2Issue12/IJETAE_1212_14.pdf

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