In Defense of Mr. Fermat

The concern here, of course, is the contradiction in terms of Fermat's Last Theorem. Many attempts and supposed proofs have preceded by professional Mathematicians and amateurs as well. Invariably, these proposed proofs have met with opposition by nature of inherent dubious assumptions and illicit conclusions. Thus clarity is a matter of first order. Motivation is equally intended. Hopefully, what remains is a matter of logical immediacy.

*Definition and Constraints **

$$r^n = a^n + b^n ,$$

Where a, b *and* r *are positive (when possible) with* $n \geq 2$.

Rewriting Exponents

What should be considered as the prominent issue is the exclusion of exponent 2 at definition of variables. This value has exceptional properties in the context of eventual generalization and subsequent proof. The method is described as "Rewriting Exponents."

OBJECT: [* holds for any n such that n is greater than or equal to 3] <u>implies</u> * may be rewritten (in possibly different r, a, b and n) as

$$v^{n'} = u^{n'} + w^{n'},$$

where n' is greater than or equal to 2 such that v, u and w are necessarily positive.

CASE 1: n has an odd divisor, q, greater than 1.

Let * be written, $r^{[(n/q)\cdot q]} = a^{[(n/q)\cdot q]} + b^{[(n/q)\cdot q]}$ and substituted as $v^q = u^q + w^q$. If $n\backslash q$ is even, v, u and w, are positive substitutions of an even exponent. On the other hand, if n/q is odd, specified positive conditions, $a > 0$ and $b > 0$, imply the relation, in v, u, w and n' has strictly positive exponential bases.

CASE 2: $n = 2^t$ where t is greater than or equal to 2. Let * be written;

$$r^{[2^{(t-1)}\cdot 2]} = a^{[2^{(t-1)}\cdot 2]} + b^{[2^{(t-1)}\cdot 2]}$$

which upon substitution becomes $v^2 = u^2 + w^2$. As before, the fact that $2^{(t-1)}$ is even implies v, u and w are positive substitutions for even exponentials. Note that the case $n = 2$ cannot be non-trivially rewritten such that its root is not possibly negative.

Having limited the existence of a positive-only solution for a rewrite of * such that r, a, b and n goes to v, u, w and n' for all n greater than or equal to 3, order is specific and consequently subject to contradiction (absent of $n = 2$).

Violation of Order

Suppose now that * has been rewritten so that r, a, b and n are transformed to a reduced form to be u, v, w and n'. Thus rewritability and initial conditions imply $n' \geq 2$ and v, u and w are positive to exclude the case $n = 2$. Consider the transformation (under n'), T, such that T: v to v, u to w, and w to u. $T(v, u, w) = Tnot(v, u, w)$ where $Tnot$ signifies "no application of T:". It follows that $[u > w]$ can be transformed to $[w > u]$ such that $[u > w]$ is concurrent**!** (**!** denotes contradiction.) This can happen only for the case, $u = w = 2$, which is moot. Conclusively, additive order must be assignable when it exists. QED

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