ON THE FULL BEAL CONJECTURE

The purpose here is to confirm Beal's Conjecture, specifically as a consequence of Fermat's Last Theorem (FLT) and a defining transform, T:, used to generalize the problem, all in context with conditions necessary to uniquely describe the values of all supposed solutions.

Consider the sum of a and b which is now unspecified: $a + b = ?$
a and b can be "cross-defined," (one in terms of the other) by the transform T: a to b^m, b to a^n, with m and n greater than 2 subject to the specification p^q where $q > 2$.

$$T^1(a + b) = b^m + a^n = p^q$$

which is the general representation of Beal's Conjecture when equivalence on the right is negated.

T may reapplied such that it does nothing to change the conditions on a and b. Reapplying T:

$$T^2(a + b) := T(b^m + a^n) :$$

$$b^{mn} + a^{mn} = p^q,$$

The latter is possible only when $a = b = 2$ (see: http://fermat.yolasite.com), in which case, $2^{mn} + 2^{mn} = 2^{mn+1}$. Now let $2^m + 2^n = p^q$ and further, $m > n$ where $a = b = 2$. Then

$$2^{m-n} + 1^{m-n} = p^q / 2^n.$$

Thus, the exponential bases on the left are unequal and therefore the quantity on the right can be at most a square when $(m–n) \geq 3$. (again see: http://fermat.yolasite.com). Otherwise, $2^r + 2^r = 2^{r+1}$ which is factorable to $1^z + 1^z = 2$ where $a = b = 1$ while p^q is reduced to 2.

In all other cases, a, b and p are factorable such that the general representation fails to hold.

Incidentally, Catalan's Conjecture is also easily rendered using the same precepts presented here.

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