

On a Possible Generalization of Fermat's Last Theorem

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Abstract

The proof of Fermat's Last Theorem marks the end of a mathematical era. We feel that in fact a stronger result could be true. In this one page paper we propose a conjecture with this hope. If by chance the conjecture will be true then the result will represent a generalization of Fermat's last theorem.

1. Introduction: Fermat's last theorem (FLT) was finally settled by Andrew Wiles [1] in the year 1995. His paper was a great achievement in itself and marked the successful end of great efforts of many able mathematicians on this problem carried over last three and half centuries. This short paper is to state a possible generalization of FLT.

2. A Possible Generalization: A generalized Fermat's last theorem can be stated in terms of the following

Conjecture (Generalized FLT): For every positive integer $k \geq 2$ there exists a positive integer $g(k)$ such that for every $n \geq g(k)$ the diophantine equation

$$x_1^n + x_2^n + x_3^n + \cdots + x_k^n = z^n$$

has no nontrivial integer solutions.

It is clear that Fermat's last theorem is a special case of this conjecture which states that for $k = 2$ the conjecture is true and $g(2) = 3$.

References

1. Wiles, A. "Modular Elliptic-Curves and Fermat's Last Theorem." *Ann. Math.* **141**, 443-551, 1995.