# AAFrempong Conjecture

(Prize for proof: To be determined)

## Abstract

The above conjecture states that if $A^x + B^y = C^z$, where $A, B, C, x, y, z$ are positive integers, $x, y, z > 2$, and $A \neq B \neq C \neq 2$, then $A$, $B$, and $C$ cannot be the lengths of the sides of a triangle. This conjecture evolved when after proving the Beal conjecture algebraically (viXra:1702.0331), the author attempted to prove the same conjecture geometrically. A proof of the above conjecture may shed some light on the relationships between similar equations and the lengths of the sides of polygons. Counterexamples could be added to the exceptions.

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**Examples:**

**1.** Since $3^3 + 6^3 = 3^5$, 3, 6 and 3; cannot be the lengths of the sides of a triangle.

**2.** Similarly, since $2^9 + 8^3 = 4^5$**,** 2, 8, and 4 cannot be the lengths of the sides of a triangle.

However, for $2^3 + 2^3 = 2^4$, 2, 2 and 2 can be the lengths of the sides of a triangle since the sum of the lengths of any two sides is greater than the length of the third side. (Note: $2 + 2 > 2$)

**Note t**he following::

In any triangle, the sum of the lengths of any two sides is greater than the length of the third side.

For $A$, $B$, and $C$ to form a triangle, **1**. $A + B > C$, **2**. $A + C > B$, and **3**. $B + C > A$.

## Main Dish

The requirement is that one should prove that if $A^x + B^y = C^z$, where $A, B, C, x, y, z$ are positive integers, $x, y, z > 2$, and $A \neq B \neq C \neq 2$, then $A$, $B$, and $C$ cannot be the lengths of the sides of a triangle.

A proof of the above conjecture may shed some light on the relationships between similar equations and the lengths of the sides of polygons.

**PS:**

An interesting observation, above, is the prime number, 2. In the Pythagorean theorem, each exponent equals 2, but in the exception to the above conjecture, each base equals 2, ($2^3 + 2^3 = 2^4$ is true), but the exponent on the second term on the left is a repetition of the first exponent. Generally, $a^n + a^n = a^{n+1}$ is true only if $a = 2$.

**Adonten**