Title Fermat's Last Theorem

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Abstract Fermat's Last Theorem states that there are no natural numbers A, B, C, and n such that A^n = B^n + C^n is true.

This effort examines the attributes of the numbers in the equation to show that natural numbers for A, B, and C cannot satisfy it, irrational number(s) are required.

Proof The proposition was first stated as a theorem by Pierre de Fermat around 1637 in the margin of a copy of Arithmetica.

https://en.wikipedia.org/wiki/Arithmetica

Fermat added that he had a proof that was too large to fit in the margin and because he had done likewise for other since-proved theorems there has since been a search to find a proof.

This effort uses the fact that the nth root of a number is irrational unless the number is a number raised to the nth power.

Consider the natural numbers A, B, C and n where A>B>C and n>2.

Assume Fermat's Last Theorem is true.

Then $A^n = B^n + C^n$

$= (B^n - C^n)+2C^n$

$= 2C^n + 2(B^n-C^n)/2$

$= 2(C^n + (B^n-C^n)/2)$

Taking nth roots $A = 2^{(1/n)}(C^n + (B^n-C^n)/2)^{(1/n)}$

Thus A is the product of 2 numbers which are nth roots namely
$2^{(1/n)}$ and a larger one $(C^n + (B^n-C^n)/2)^{(1/n)}$.
These numbers are irrational as is their product.

The conclusions are that the theorem is true and the margin probably ***wasn't*** big enough.