

Fermat's Last Theorem



Pierre de Fermat

Fermat's Last Theorem states that there are no nonzero integer solutions to the equation $x^n + y^n = z^n$ for any integer $n > 2$. Of course if $n = 2$, then there are nonzero integer solutions such as $3^2 + 4^2 = 5^2$.

In 1637, Pierre de Fermat, a French lawyer and amateur mathematician, made this conjecture by famously scribbling it (in Latin) in the margin of his copy of an ancient Greek text, *Arithmetica*, by Diophantus. He also claimed that he had a "marvelous" proof but it was too large to fit in the margin. Fermat published little of his work and the discovery of his conjecture occurred after his death in 1665.

Despite the best efforts of countless, brilliant mathematicians in the centuries that followed, no successful proof was published until 1995, over 350 years later.

After six years of working on Fermat's Last Theorem in almost complete secrecy, English mathematician Andrew Wiles announced a proof in 1993. It was over 100 pages long! He proved the modularity theorem for semistable elliptic curves, which was enough to prove Fermat's Last Theorem. His "proof" had a serious flaw, however, but after working on it for another year he was able to repair the proof. A corrected version was published in 1995.



Andrew Wiles

Fermat's Last Theorem helped stimulate the development of number theory and is one of the most famous theorems in the history of mathematics.



In *Star Trek: The Next Generation* episode "The Royale," Captain Picard (Patrick Stewart) famously says that Fermat's Last Theorem has remained unsolved for 800 years.