

## Pierre de Fermat – Probability and a Mysterious “Last” Theorem

French Mathematician, born Languedoc, August 17, 1601. Died: Castres, January 12, 1665

Fermat, is probably best known for his famous “Last” Theorem, but he was a prodigious mathematician who worked in many branches of mathematics. He was the son of a leather merchant, and was educated at home. He went on to study law and became a counselor for the Toulouse parliament. He did mathematics in his spare time, which is incredible for all the work he did in that discipline.

He had a frustrating habit of scribbling notes in margins of books and did not publishing his findings. Because of this, he loses credit for the discovery of analytic geometry that was given to Descartes, although his geometry included three dimensions while Descartes only looked at two dimensions. Also, he also discovered some features of calculus that Newton employed.

He, together with Pascal, founded the theory of probability. He also extended the work that Diophantus had done 1 400 years earlier. So he could be considered the modern “Father of Number Theory”. Imagine having two of your “children” being Probability and Number Theory!

In number theory he left us with his famous “Last Theorem”. He was looking at the problem that Diophantus had posed in that the equation:  $x^n + y^n = z^n$  had no whole number solutions for  $n > 2$ . When  $n = 2$ , we have many solutions to the resulting equation:  $x^2 + y^2 = z^2$ , for instance:  $3^2 + 4^2 = 5^2$ ,  $5^2 + 12^2 = 13^2$ , and  $7^2 + 24^2 = 25^2$  all solve it. These are called Pythagorean Triples, and we discussed them on Friday, March 6, 2009. However if we try to solve:  $x^3 + y^3 = z^3$  or  $x^4 + y^4 = z^4$  and so on, then we can find no solutions. Fermat scribbled in the margin of Diophantus’ book that he had found a proof for this theorem, but did not have room to write it out. Remember, just because a set of whole numbers that solved one of them have never been found, does not mean that one does not exist. The numbers or the exponents could be very large. However, Fermat died, and never did reveal his proof to anybody. For the next 330 or so years, this famous “Fermat’s Last Theorem” has been searched for by all mathematicians, but was never found until June 23, 1993. A Princeton mathematician named Dr. Andrew Wiles has stated that he has found the proof.

In a book by Marilyn vos Savant, the woman who has had the highest registered IQ in the world, challenges the findings of Dr. Wiles. The book is called The World’s Most Famous Math Problem, and is published by St. Martin’s Press, New York, 1993.

So, at this moment, we will leave it as open. I will do some more research on this and attach a memo.