

# 17th-Century French Mathematics

The most celebrated work of **René Descartes** was his 1637 *Discours de la Méthode* (Discourse on Method), a philosophical treatise on universal science. In 1937 a stamp appeared with the incorrect title of *Discours sur la Méthode*; it was later replaced by the correct version. The *Discours* included a 100-page appendix, *La Géométrie*, containing Descartes's fundamental contributions to analytic geometry. Here he solved an ancient problem of Pappus on the path traced by a point moving in a specified way relative to a number of fixed lines. Descartes named two particular lengths  $x$  and  $y$  and calculated all other lengths in terms of them, obtaining a conic as the required path. He thus introduced algebraic methods into geometry, but did not initiate the Cartesian coordinates (with orthogonal axes) usually named after him.

A *Mersenne prime* is a prime number of the form  $2^n - 1$ , such as 8 and 31. Only 47 of them are known, the largest being  $2^{57885161} - 1$ , which has 17,425,170 digits. The one featured on the stamp was discovered in 2001 and has about four million digits. They are named after the Minimite Friar **Marin Mersenne**, who found nine of them.

**Pierre de Fermat** followed a legal career in Toulouse. He published little and communicated with other mathematicians by letter. He made substantial contributions to the development of analytic geometry, but is mainly remembered for his contributions to number theory. In his copy of Diophantus's *Arithmetica*, Fermat claimed to have "a truly marvellous demonstration, which this margin is too narrow to contain" of what became known as *Fermat's last theorem*: for any integer  $n > 2$  the equation  $x^n + y^n = z^n$  has no non-zero integer solutions  $x$ ,  $y$ , and  $z$ . This was eventually proved by Andrew Wiles in 1995.

**Blaise Pascal** showed an early interest in mathematics. At the age of 16, he discovered his hexagon theorem about six points on a conic joined in a particular way. He wrote on probability and hydrodynamics, and the arithmetical triangle of binomial coefficients is named after him; in 2014 Pascal's triangle appeared on a stamp from the International Congress of Mathematicians.



René Descartes



Descartes's *Discours*



Pierre de Fermat



Mersenne prime



Fermat's last theorem



Blaise Pascal



Pascal's triangle

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