Section 2.3
France and Prime Numbers

Who: François Viète, Marin Mersenne, and others

What: France in the 17th century

When: 1588-1665

The first great French mathematician after the Renaissance was François Viète. Born in 1540, Viète was primarily a lawyer and a member of parliament. As his wealth increased, however, he spent more and more of his leisure time studying mathematics. In particular, he was interested in cryptography, trigonometry, and algebra.

His political life was routinely besieged by turmoil. He was allied with the Protestant Reformation in France, and therefore he had many Catholic (and powerful) enemies. He was also highly critical of the Gregorian calendar prepared by Cristof Clavis, and unleashed a long series of bitter attacks against him. This did not repair his image in the eyes of the church.

Mathematically, he is most known for his algebraic symbolism. He culled from the most respected texts of the previous 1500 years, and made many improvements. He used vowels of the alphabet for unknown quantities and consonants for known ones. Instead of a different symbol for each power of a quantity or unknown, Viète made the change to a single variable properly qualified. In other words, $x, x^2, x^3, \ldots$ would have been written as A, A quad, A cub$\ldots$. By this time other standards were becoming common in algebra. In 1489 Widman introduced the + and - signs to represent positive and negative quantities (respectively), and in 1557 Robert Recorde used the two equal length parallel lines "=" to represent equality. He explained this symbol saying: "bicause noe 2 thynges can be moare equalle."

In 1579 Viète approximated π correct to 9 decimal places by using the classical polygon method (having 393,216 sides). He also discovered the equivalent of the interesting identity

$$\pi = 2 \cdot \frac{2}{\sqrt{2}} \cdot \frac{2}{\sqrt{2+\sqrt{2}}} \cdot \frac{2}{\sqrt{2+\sqrt{2+\sqrt{2}}}} \cdots$$

Another French number theorist of the 17th century is Marin Mersenne. A Minimite friar, Mersenne corresponded with many of the greatest mathematicians of his day. In a time when there were no research journals, Mersenne served as a disseminating body for new results. Upon his death, letters were found from 78 different mathematicians including Fermat, Huygens, Pell, Hobbes, Galileo, and Torricelli. He also regularly opened the monastery for gathering of mathematicians including Desargues, Roberval, Descartes, and both Pascals (father and son).

Although much of his fame can be attributed to this centrality to mathematical research during the century, he is most remembered for his involvement in the search for perfect numbers. Since the days of the early Greeks, mankind had been fascinated with perfect numbers. Mathematicians and non-mathematicians alike were intrigued by their curious properties. Even the theologian Saint Augustine (354-430) remarked that even though God could have created the world in one day (if he so desired), he chose to take 6 days because 6 is the first perfect number.