**Topic:** DesCartes, Pascal, Fermat

**Notes on Topic:**

As we have just seen when studying Mersenne, all three men had close contact with Mersenne

Rene Descartes:  
Philosopher and mathematician  
Released a treatise on “universal science” in his philosophical book *Discours de la methode*  
His work *La Geometrie* introduced analytic or Cartesian geometry to the world, the first time anyone had married algebra and geometry  
He invented the notation of using x, y, z to denote unknowns while a, b, c denote known quantities (?)  
  
Blaise Pascal:  
Pascal started attending mathematical lectures at age 14  
Pascal invented a calculating machine that is a direct predecessor of the modern computer, at age 18  
He made significant contributions to the world of probability, building on what Cardano had established a century before   
He dropped mathematics from his studies when it did not fit into his religious plan, but during a nagging toothache his mind wandered to mathematics and the pain subsided, which he took as a heavenly sign and returned to studying the subject at age 35  
He discovered several properties of the cycloid curve  
He died at age 39  
\*\*not mentioned in the book\*\* Pascal’s triangle, in *Treatise on the Arithmetical Triangle*, Pascal greatly discusses the pattern of binomial coefficients which led Newton to his discovery of the Binomial Theorem  
  
Pierre de Fermat:  
Also had many works in analytic geometry, and perhaps before Descartes, but did not publish before him, so it is still unknown and it is known to be more “modern” than the works of Descartes  
Fermat also worked in the area of probability  
He also made great strides in the area of calculus  
His most prominent work left behind is that in the field of number theory  
When *Arithmetica* from Diophantus was rediscovered and translated during the Renaissance, Fermant acquired a copy and was soon making his own discoveries regarding the properties of whole numbers  
It was common for him to state that he has a new truth and claim that he has a proof to go along and never provide the proof, leaving Euler, years later, to do the work  
There is a common argument as to who to accredit the work then, Fermat who first stated the claim, or Euler who provided the proof  
The most famous “theorem” of Fermat’s was scribbled beside Diophantus’ Proposition II.8, expressing that a perfect square is the sum of two other squares -- Fermat claimed that one cannot describe a perfect cube, or perfect fourth powers, in general, no power larger than two can be expressed as the sum of two other numbers to said power  
Fermat claimed that there was no room in the margin of the book to write the proof, and said if only he had a blank page  
Euler was able to show the proof for n=3 and n=4, but no other powers and certainly not a general case  
Sir Andrew John Wiles originally proved this theorem in 1993, but when an error was found he started his journey yet again, finally publishing the proof in 1995, the papers which contain the proof are 129 pages long and the proof consumed seven years of Sir Wiles’ life  
  
The seventeenth century, known as the Heroic Century was coming to an end, with large results published in algebraic notation, analytic geometry, probability and number theory, but the supreme hero of the heroic century had yet to reign. “...to change the way mankind would ever after look at the world. His name, of course, was Isaac Newton.” JTG 160.

**Additional Suggested Reading**: None

**Assignment:** None