Section 2.4
Pierre Fermat

Who: The one and only
What: The birth of modern number theory
When: 1601-1665

When we think of the most brilliant people in mathematics in the last 400 years, names like Rene Descartes, Carl Gauss, Isaac Newton, Gottfried Leibniz, and Blaise Pascal (among others) are sure to come to mind. Descartes discovered/created analytic geometry, Gauss was a genius in number theory, Newton and Leibniz developed the calculus (which has been called the greatest achievement of mankind), and Pascal counts the founding of probability theory among his many claims to fame. However, aside from forming an impressive roster of mathematicians, another thing all these greats have in common is a debt of gratitude to Pierre Fermat.

Fermat was born in France to wealthy and hard working parents. From an early age, Fermat showed a great deal of interest classical works in many fields such as Latin, philosophy, literature, and mathematics. However, in the early 17^{th} century, mathematics was not a profession with employment opportunities outside of private tutoring. So while working as a lawyer, Fermat spent his free time on many mathematical problems and topics that would have enormous impact.

Fermat's true love, and the area of his most enduring mathematical contributions, was number theory. He posed many problems in the field in correspondences with Pascal, Frenicle de Bessy, Christian Huygens, Marin Mersenne, and Gilles Roberval. In many cases he claimed to have solved the stated problem, but would only give further explanation after the recipient had attempted the problem. He resisted many requests to publish his proofs, ideas, and results. He seemed genuinely disinterested in fine tuning a proof to the point where is could be published. Rather, he enjoyed jotting down a few hints or notes and then announcing the conclusion.

Aside from his voluminous collection of letters, from which many of results were retrieved, Fermat left a large collection of theorems/conjectures in the margins of his books. Five years after his death, his son Samuel brought forth a new edition of Diophantus' *Arithmetica* that contained his fathers marginal notes. It was in this edition that we first learned of Fermat's most famous theorem.