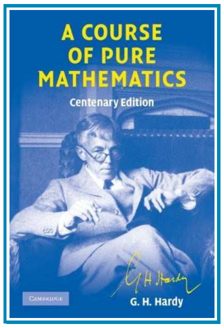
Bibliography

Most of my mathematical education especially after schooling is totally based on various books and in recent past on online articles and blogs. While online material is a good and easily available source of all kinds of information, it can never beat the joy of reading a book (especially in physical form of a paper book). Here I am sharing information about some of the books which have shaped my mathematical thinking and given me immense pleasure.

A Course of Pure Mathematics

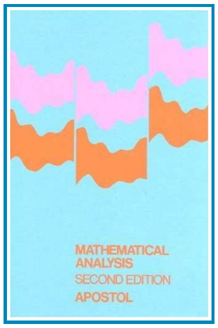
by G. H. Hardy



This is *the one* book which I want my blog readers to go through. This is the first great book which I came across at a very young age of 16 years and since then mathematics acquired a new meaning in my life. The book deals primarily with what is usually called *calculus*, but technically called *Mathematical Analysis*. It serves as the best introduction to this field. I have written reviews of this book here and here.

Mathematical Analysis

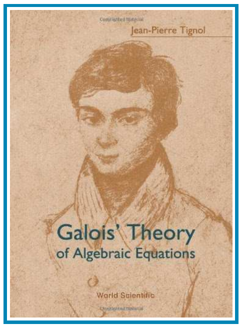
by Tom M. Apostol



This book provides a very good treatment of topics in analysis (metric spaces, integration, fourier series and elementary complex analysis) and can be read as a sequel to Hardy's book mentioned above. Although the book is written in a formal style (typical of American books), it has exciting material for the interested reader. I still remember when I had gone to a local bookstore to find a book on mathematical analysis. While browsing through its pages I saw a proof of irrationality of e in the first chapter and then a small note giving a reference of an exercise in a later chapter for a proof of irrationality of π. This was a big deal for me at that time (1999) and I bought the book instantly to get hold of Ivan Niven's proof of irrationality of π. The book has been a great help in the development of the posts related to Riemann Integral and Functions of Bounded Variation.

Galois' Theory of Algebraic Equations

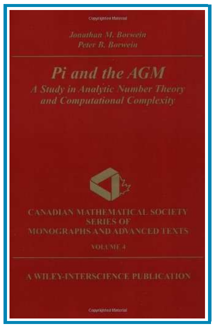
by Jean Pierre Tignol



This book provides a very good treatment of evolution of Galois theory from a chronological perspective and covers the material in a classical fashion devoid of the symbolism of Modern Algebra. Because of this particular approach this book is accessible to people familiar with ordinary algebra This book also covers topics which are intrinsically very interesting (like Gaussian Periods) but have become non-fashionable in modern treatments of algebra. This book was instrumental in the development of series of posts titled "Gauss and Regular Polygons."

Pi and the AGM

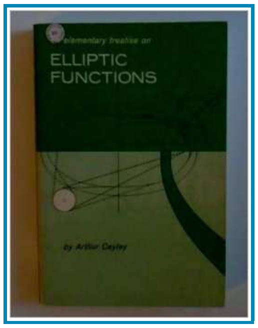
by Jonathan M. Borwein and Peter B. Borwein



This is a very singular book on the theory of elliptic functions and the treatment is based on the simple concept of arithmetic-geometric mean. The book develops many identities related to elliptic and theta functions and also provides the first proof for Ramanujan's series for $1/\pi$. In the later parts of the book these theories are used to establish running time for algorithms related to calculation of various mathematical constants. A lot of my posts on theta functions and Ramanujan's series are based on this unique book.

An Elementary Treatise on Elliptic Functions

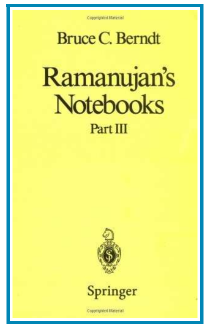
by Arthur Cayley



Cayley's book serves as a very good introduction to elliptic functions closely following Jacobi's approach. Especially the theory of transformation of elliptic integrals is treated in a very elementary manner so that it is accessible to anyone with reasonable knowledge of calculus. The derivation of modular equations is also based on the transformation theory. The book is an old classic in this field and anyone wishing to study elliptic functions is advised to read this book. My series on modular equations in the spirit of Jacobi is based on the treatment provided in this book.

Ramanujan's Notebooks: Part III

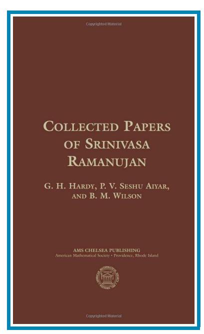
by Bruce C. Berndt



Berndt has done an excellent job of editing Ramanujan's hand-written notebooks and thus providing a proof of nearly 3500 results contained in these notebooks. Ramanujan's work was largely forgotten by the modern mathematicians and it is to Berndt's credit that the field of Ramanujan mathematics has been revived and given its due importance in modern mathematical circles. It is a delight to go through this masterpiece and keep wondering about the creative genius of Ramanujan. I have mainly studied volume 3 of this 5 volume work and most of my presentation of the Ramanujan's theory of modular equations is borrowed from this reference.

Collected Papers of Srinivasa Ramanujan

by Srinivasa Ramanujan



Fortunately Ramanujan provided proofs of some of his theorems and published them in various journals while he was in England. With the thrust from Hardy most of these papers were collectively published in this work and serve as a window to the mind of Ramanujan. His original ideas and methods of proof are astonishing and a sample of these can be found in his collected papers. At the same time this happens to be a very inspiring work. I have read some papers from his collected works and have given an exposition of these in my posts on Ramanujan's series and Rogers-Ramanujan Continued Fraction.

By Paramanand Singh