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A Motivated Introduction to the Riemann Zeta-Function

The Riemann zeta-function is important in mathematics both because it encodes valuable information about the prime numbers and because it is the prototype for all L-functions. The purpose of this course is to present a motivated overview of the classical and modern theory of the zeta-function. We will present the main questions of the subject, explain why they are important, what we do and do not know about them, and the tools used to approach them. Some of the topics we will cover are the distribution of zeros and other values of the zeta-function, large and small values of the zeta-function, and moments of the zeta-function. The focus throughout will be on key concepts and applications.