

# Riemann Hypothesis

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In 1859, a german mathematician, Bernard Riemann, postulates that the Riemann Zeta Function only has zeroes at its even negative numbers. This comes after he obtains a formula for the number of primes up to a certain limit. This formula utilizes the zeroes of the Riemann Zeta function. A simple version of the Riemann Zeta function can be expressed by the following:

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s}.$$

The domain for this function is all real numbers greater than 1. Although this can be expanded by methods of analytic continuation so that the function has a domain for negative integers. There are many interesting facts surrounding the Riemann Hypothesis. Other than being an unsolved mathematical conjecture it is also challenge to win 1 million dollars. Offered by the Clay Mathematics Institute in 2000, the Riemann Hypothesis was dubbed a millenium problem. Another interesting fact about the Hypothesis is if solved it could give us more information on the distribution of prime numbers. Some believe with a proof of the Riemann Hypothesis then there will be some security flaws with RSA Encryption methods.

## References

- [1] Bombieri, Enrico (2000), The Riemann Hypothesis – official problem description (PDF), Clay Mathematics Institute, retrieved 2008-10-25 Reprinted in (Borwein et al. 2008).