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The Mechanics of Integers

Part I - A Solution to the Riemann Hypothesis

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Structure of Article

Abstract

This paper explores raising an integer n, or its reciprocal, $1/n$, to the complex power s where $s = a + i\alpha$ using the transformations of Modal Harmonics. The Riemann Hypothesis states that all zeros of the sum to infinity of $1/n^s$, also known as the zeta function, occur at $a = ½$. When mapped conventionally the zeta function has no zeros because the real and imaginary parts cannot zero simultaneously. The transformation is an alternate mapping which enables evaluation over a range around a point rather than at that point. With the transformation it is shown that a must equal ½ at all zeros as postulated by Riemann. This analysis shows the deep connection between the set of integers n and the zeros of $1/n^s$. We consider the integers as a special case of the more general number set n^s which includes the complex and irrational numbers. Then α represents the position of a spinner in the complex plane and a determines its magnitude, thus defining whether it is rational or irrational. The zeros of $1/n^s$ occur when 1) the imaginary component of n^s equals zero thus n is real and 2) there are no roots of n thus n is rational. For a single number n^s (not a ratio) this leaves only the set of integers n. Thus at the zeros of $1/n^s$, n^s equals n.