



**THE MYSTERY OF THE RATIONAL NUMBER “1/2” AND  
A PROOF OF THE RIEMANN HYPOTHESIS**

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**Abstract**

In this paper, we present a proof of the Riemann hypothesis, we have mentioned in my paper that the rational number  $1/2$  is a quantum number, which means that the rational number  $1/2$  itself should follow the principles of quantum mechanics, so quantum superposition principle can be applied also on the rational number  $1/2$ , after that we showed in paper that due to the quantum superposition state of the rational number  $1/2$ , the imaginary unit  $i$  has two values at the same time ( i.e.,  $i = \sqrt{-1}$  and  $i = -1$  simultaneously) and also the rational number  $1/2$  equals any real number simultaneously. After that we prove that the real part of any complex number equals  $1/2$  due to the quantum superposition state of the rational number  $1/2$ . Since the complex zeros of the Riemann zeta function is also complex numbers and since the real part of any complex number equals  $1/2$  due to the quantum superposition state of the rational number  $1/2$ , hence the real part of all non-trivial zeros of the Riemann zeta function equals  $1/2$ , which proves the Riemann hypothesis.

**Keywords and phrases:** Riemann zeta function, Riemann hypothesis, spin quantum number, quantum superposition.