Riemann hypothesis

Justin Walter

Abstract

This short paper is about the nontrivial zeros of Riemann's zeta function.

Assume $\xi(z)$ is the real part of a nontrivial zero between $0 < Re(z) < 1$

define:

$$\xi(z) = 1/2\, z\, (1 - z)\, \pi^{-z/2}\, \Gamma(z/2)\, \zeta(z)$$

which satisfies the reflection formula

$$\xi(z) = \xi(1 - z)$$

if we put in any real part between $0 < Re(z) < 1$ in the reflection formula

$$\xi(0) = \xi(1) = 1/2$$

the only invariant real part in $\xi(z)$ is $Re(z) = 1/2$

$$\xi(1/2) = \xi(1/2)$$

because $Re(z) = 1/2$ is the real part of a nontrivial zero and $Re(z) = 1/2$ is invariant in $\xi(z)$, the real part of every nontrivial zero of the Riemann zeta function is invariant at $1/2$.

References:

https://en.wikipedia.org/wiki/Riemann_Xi_function