Resolution of Riemann hypothesis that is true.

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Abstract:

The Riemann hypothesis is proved to be true which states that all the non-trivial zeros of Riemann zeta function lie along the line R(z)=1/2 for 0<R(z)<1.

The work done here clarifies that there is no need to find out the non-trivial zeros of the Riemann zeta function to prove the Riemann hypothesis true as the Riemann hypothesis must be true for the functional equation satisfied by the zeta function to exist itself structurally in mathematics.

Abbreviations:

ζ() is the zeta function,

Γ () is the gamma function.

Sin () is the trigonometric sine function

Z **is complex variable.**

Power () is the something raised to the power something.

R () is real part of complex variable and

Imz() is the imaginary part of complex variable

A is the mathematical space ranging from -∞ to +∞ along real and imaginary axis both.

B is the mathematical space smoothly enclosed inside A ranging from 0 to 1 along real axis and the entire imaginary axis

Introduction:

To prove the Riemann hypothesis which is true.

The Riemann hypothesis is a conjecture which states that all non-trivial zeros of Riemann zeta function has real part ½.

This is a part of of problems 3, along with the Goldbach conjecture, in Hilbert's list of 23 unsolved problems.

Theory:

The functional equation (1) satisfied by Riemann zeta function in space A has been tested in this paper structurally in algebraical world before further proceeding into finding its any trivial and non-trivial zeros.

To hold the functional equation **(1)** to be structurally valid in algebra, basic conditions for existing Riemann zeta function must hold true The pre-requisite conditions are more than sufficient to prove the Riemann hypothesis true and therefore no specific need to find out the exact zeros .

Algebraic conditions to be satisfied here by the elements of functional equation involve the basic algebra of numeric 0 in an equation

There are two aspects of this functional equation here
1. It is valid in the structural aspects of pure mathematical laws (the primary condition) in space A
2. It is also structurally valid to hold the specific function Riemann zeta function true. (secondary condition) in micro space B

The Riemann hypothesis must be true as it must hold both primary and secondary conditions true.

Calculations:

The functional equation satisfied by Riemann zeta function in the strip
0<R (*z*) <1 i.e. space B is
ζ (*z*)=2^s* Π^(s-1)sin (Π*z*/2) Γ(1-*z*) ζ(1-*z*)
……………………………….(1)

Primary condition(required for pure mathematics for any function having this structure)

Sin () =0 concludes ζ () =0 if and only if

Other elements are algebraically not 0.which are evident from the properties of these functions in space and also from the basic law of algebra which says:
0 is not = 0 * 0
0 = 0* (some non-zero number)

This restricts that
Riemann zeta function has to satisfy specific primary condition to exist in the space A

i.e. **in space A**

ζ (z) = 0 but
ζ (1-z) is not =0…………………………………………………………………………**(2)**

Secondary condition :
(required for Riemann zeta function which is its specific property besides the e conditions)

In the space B, sin (), power () and Γ () are not = 0 evident from the properties of these functions.

This implies in L.H.S.

ζ (z) =0 iff
In R.H.S

ζ (1-z) = 0……………………………………………………….**(3)**

Now replacing the variable *z* by ½-*z*
The equation (1)
Becomes
$\zeta(1/2-z) = 0$
$\zeta(1/2+z)$ not= 0 <u>in space A</u>..(4)

The equn.(2) becomes
ζ $(1/2-z)= 0$,
$\zeta(1/2+z)=0$ <u>in space B</u>………………………………(5)

The equations (4) & (5) give the results

ζ (z) not=0 for R(z)> 1/2 &

ζ(z) =0 only along the line R(z)= ½ for 0<R(z)<1. …… (6*)

Result:

Hence the Riemann hypothesis is proved to be true that all non-trivial zeros of Riemann zeta functions will lie along the line R (z) =1/2 for 0<R (z) <1 and
Also accompanied that Riemann zeta function can't be zero for R (z)>1/2.

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Reference:

http://en.wikipedia.org/wiki/Riemann_hypothesis