Riemann Hypothesis Conjecture Proof

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Abstract

In This paper we will going to show that, if we can rewrite all natural numbers and its reciprocal as a complex number (a + b i) such that the real part =0.5; and summed all these natural numbers and their reciprocals up until infinity; the sum will be equal to Zero for any (S), then we proofed that Riemann hypothesis for none-trivial zeros for Zeta function. That all none-trivial zeros of Zeta function are on critical strip at x = 0.5.

Keywords: zeta function, Riemann hypothesis, complex plane, none-trivial zeros, critical strip

1. Introduction

We are going to show how if we can rewrite any natural number in Zeta function sum series in the form of [Real part + Imaginary Part], such that [Real part = 0.5] and we added all the terms up to infinity we are going to reach Zero for any value Z(S) for any value for S.

We are going to rely on imaginary number characteristics. And sum of Zeta function at S=0; $\zeta(0)$

$$\frac{1}{i-1}+\frac{i}{2}=-\frac{1}{2} \Rightarrow EQ(1)$$

$$\frac{1}{i+1}+\frac{i}{2}=\frac{1}{2} \Rightarrow EQ(2)$$

$$\zeta(0)=-\frac{1}{2} \Rightarrow EQ(3)$$

1.1 Proof methodology

1- *If each Natural Number can be re written as a complex number (a + b i) such that (a = 0.5)*
And we added all the terms from 1 up until ∞ and the sum is zero then.
We proofed that if we re written all the number in this form (0.5 + b i) we get all the Zeros including the none-trivial Zeros.

$$\frac{A}{i-1}+\frac{A*i}{2}+\frac{A}{2}=0\,;\,such\ that\ A\ any\ real\ number$$

2- *Any Natural number can be written as a complex number (a + b i) such that (a =0.5)*
And the sum after we write each Natural number in this form (0.5 +b i) the sum will be Zero.

$$A=\frac{-A}{i-1}-\frac{A*i}{2}+\frac{\left(4*\left(\frac{A}{2}-\frac{1}{2}\right)\right)}{4}+\frac{1}{2}\,;\,such\ that\ A\ is\ any\ real\ numebr$$

3- *Zeta function have only one pole at 1; so, if we were able to proof that the Sum of Zeta function = Zeta Sum – 0.5; then we proofed that all non-trivial Zeros will be critical line at 0.5.*

$$If\ \zeta(S)=\ 0\ and\ \ \zeta(S)\ have\ one\ pole\ at\ 1;\quad \zeta(S)=\left(\zeta(S)-\frac{1}{2}\right)$$

Then all Zeros are at Critical line
We will proof these three points in three cases.

$$\boldsymbol{Case\ (1):\ \zeta(-1)}$$
$$\boldsymbol{Case\ (2):\ \zeta(1)}$$
$$\boldsymbol{Case\ (3):\ \zeta(S)}$$

1.2 Recursive Substitution and Zeta functional formula

If we have any function

$f(S) = A_1 * f(s-1); where\ f(s-1)\ is\ the\ previous\ term\ for\ f(S)\ , and\ A_1\ any\ real\ number$

And

$$f(s-1) = A_2 * f(S-2)$$

And

$$f(s-2) = A_3 * f(S-3)$$

We continue until we reach the first term f (0)

$$f(s-\infty) = A_{\infty-1} * f(0)$$

If we back substitute recursively

$$f(S) = A_1 * A_2 * A_3 * \dots * A_{\infty-1} * f(0) \Rightarrow EQ(A1.1\_1)$$

And In case of Zeta functional formula

$$\zeta(0) = -\frac{1}{2}$$

$$\zeta(S) = A_1 * A_2 * A_3 * \dots * A_{\infty-1} * -\frac{1}{2} \Rightarrow EQ(A1.1\_2)$$

$$f(S) = C * \left(-\frac{1}{2}\right)\ or\ we\ can\ say\ that\ \zeta(S) = C * \left(-\frac{1}{2}\right) \Rightarrow EQ(A1.1\_3)$$

We know that Zeta function have only one pole = 1; i.e., at x-1 we reach its Zero.

and any multiplication on line number by (-1/2) means we are shifting on the line number by (1/2) to the left.

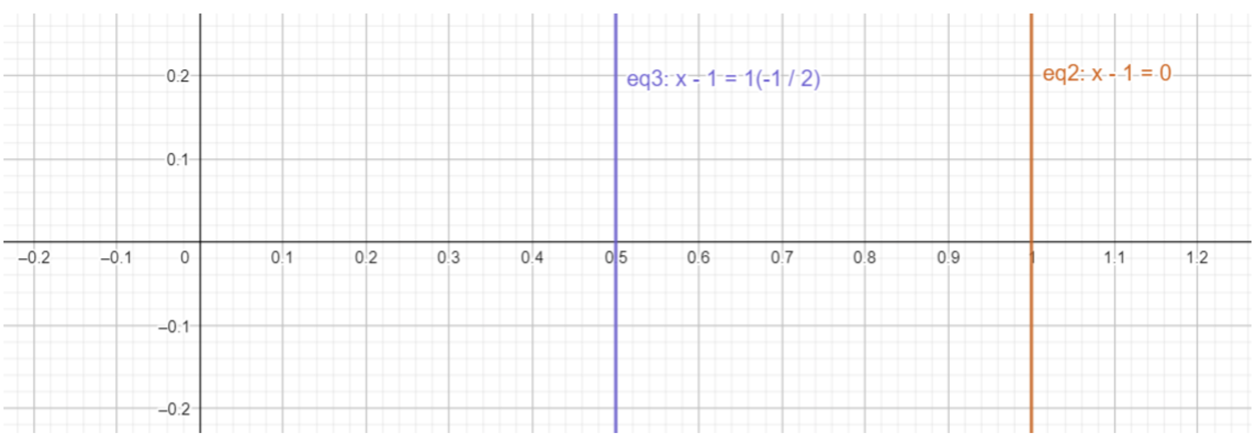

Figure 1. show the shift effect of $\zeta(0) = -\frac{1}{2}$ *on the Zeta function pole.*

1.3 *Proof Methodology for Case (1):* $\zeta(S)$ at S = -1

$$\zeta(S) = \sum_{N=1}^{\infty} N^{-S}$$

$$\zeta(-1) = 1+2+3+4+5+6+7+8+9+\cdots \Rightarrow EQ(1.2_1)$$

1- Multiply both sides of $EQ(1.2_1)$ by $\frac{1}{i-1}$

$$\frac{1}{i-1} * \zeta(-1) = \frac{1}{i-1} * (1+2+3+4+5+6+7+8+9+\cdots)$$

$$\frac{1}{i-1} * \zeta(-1) = \left(\frac{1}{i-1}+\frac{2}{i-1}+\frac{3}{i-1}+\frac{4}{i-1}+\frac{5}{i-1}+\frac{6}{i-1}+\frac{7}{i-1}+\frac{8}{i-1}+\cdots\right) \Rightarrow EQ(1.2_2)$$

2- Multiply both sides of $EQ(1.2_1)$ by $\frac{i}{2}$

$$\frac{i}{2} * \zeta(-1) = \frac{i}{2} * (1+2+3+4+5+6+7+8+9+\cdots)$$

$$\frac{i}{2} * \zeta(-1) = (\frac{i}{2}+\frac{2*i}{2}+\frac{3*i}{2}+\frac{4*i}{2}+\frac{5*i}{2}+\frac{6*i}{2}+\frac{7*i}{2}+\frac{8*i}{2}+\frac{9*i}{2}+\cdots) \Rightarrow EQ(1.2_3)$$

3- - Multiply both sides of $EQ(1.2_1)$ by $(\frac{1}{2})$

$$\frac{1}{2} * \zeta(-1) = (\frac{1}{2}+\frac{2}{2}+\frac{3}{2}+\frac{4}{2}+\frac{5}{2}+\frac{6}{2}+\frac{7}{2}+\frac{8}{2}+\frac{9}{2}+\cdots) \Rightarrow EQ(1.2_4)$$

Add all three equations together $EQ(1.2_2)$ *and* $EQ(1.2_3)$ *and* $EQ(1.2_4)$
Then we need to find that in the Right-hand side; if we can rewrite all the number as (0.5 + some imaginary number) and all added together equal to 0 in the Right-hand side, then this proofs first point in our proof methodology.

The Left-hand side of $EQ(1.2_2) + EQ(1.2_3) + EQ(1.2_4)$

$$LHS = \frac{1}{i-1} * \zeta(-1) + \frac{i}{2} * \zeta(-1) + \frac{1}{2} * \zeta(-1)$$

$$LHS = \left(\frac{1}{i-1}+\frac{i}{2}+\frac{1}{2}\right) * \zeta(-1) = \left(\zeta(0)+\frac{1}{2}\right) * \zeta(-1) = 0 * \zeta(-1) = 0 \Rightarrow EQ(1.2_5)$$

The Right-hand side of $EQ(1.2_2) + EQ(1.2_3) + EQ(1.2_4)$

$$\begin{aligned} RHS = &\left(\frac{1}{i-1}+\frac{2}{i-1}+\frac{3}{i-1}+\frac{4}{i-1}+\frac{5}{i-1}+\frac{6}{i-1}+\frac{7}{i-1}+\frac{8}{i-1}+\cdots\right) \\ &+\left(\frac{i}{2}+\frac{2*i}{2}+\frac{3*i}{2}+\frac{4*i}{2}+\frac{5*i}{2}+\frac{6*i}{2}+\frac{7*i}{2}+\frac{8*i}{2}+\frac{9*i}{2}+\cdots\right) \\ &+\left(\frac{1}{2}+\frac{2}{2}+\frac{3}{2}+\frac{4}{2}+\frac{5}{2}+\frac{6}{2}+\frac{7}{2}+\frac{8}{2}+\frac{9}{2}+\cdots\right) \end{aligned}$$

$$re\ arrange\ all\ the\ terms$$

$$RHS = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) + \left(\frac{2}{i-1} + \frac{2*i}{2} + \frac{2}{2}\right) + \left(\frac{3}{i-1} + \frac{3*i}{2} + \frac{3}{2}\right) + \left(\frac{4}{i-1} + \frac{4*i}{2} + \frac{4}{2}\right) + \left(\frac{5}{i-1} + \frac{5*i}{2} + \frac{5}{2}\right) + \left(\frac{6}{i-1} + \frac{6*\ i}{2} + \frac{6}{2}\right) + \left(\frac{7}{i-1} + \frac{7*\ i}{2} + \frac{7}{2}\right) + \left(\frac{8}{i-1} + \frac{8*i}{2} + \frac{8}{2}\right) + \cdots \right) \Rightarrow EQ(1.2_6)$$

We can generalize EQ (1) by multiply both sides by A

$$\frac{A}{i-1} + \frac{A*i}{2} = -\frac{A}{2}$$

$$\frac{A}{i-1} + \frac{A*i}{2} + \frac{A}{2} = 0 \Rightarrow EQ(1.2_7)$$

$$Then\ from\ \ EQ(1.2_7)\ each\ term\ in\ EQ(1.2_6)\ will\ be\ 0$$
$$which\ means\ that\ RHS = 0$$

1- *If we looked at each term in,* $EQ(1.2_6)$ *we can rewrite it as (some complex number + 0.5) and still RHS = 0*

$$RHS = 0 = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) + \left(\frac{2}{i-1} + \frac{2*i}{2} + \frac{1}{2} + \frac{1}{2}\right) + \left(\frac{3}{i-1} + \frac{3*i}{2} + \frac{2}{2} + \frac{1}{2}\right) + \left(\frac{4}{i-1} + \frac{4*i}{2} + \frac{3}{2} + \frac{1}{2}\right) + \left(\frac{5}{i-1} + \frac{5*i}{2} + \frac{4}{2} + \frac{1}{2}\right) + \left(\frac{6}{i-1} + \frac{6*\ i}{2} + \frac{5}{2} + \frac{1}{2}\right) + \left(\frac{7}{i-1} + \frac{7*\ i}{2} + \frac{6}{2} + \frac{1}{2}\right) + \left(\frac{8}{i-1} + \frac{8*i}{2} + \frac{7}{2} + \frac{1}{2}\right) + \cdots \right) \Rightarrow EQ(1.2_8)$$

2- *If we looked at each term in,* $EQ(1.2_6)$ *we can rewrite it as, (-0.5) * (some complex number) and still RHS = 0*

$$RHS = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) + \left(\frac{2}{i-1} + \frac{2*i}{2} + \frac{2}{2}\right) + \left(\frac{3}{i-1} + \frac{3*i}{2} + \frac{3}{2}\right) + \left(\frac{4}{i-1} + \frac{4*i}{2} + \frac{4}{2}\right) + \left(\frac{5}{i-1} + \frac{5*i}{2} + \frac{5}{2}\right) + \left(\frac{6}{i-1} + \frac{6*\ i}{2} + \frac{6}{2}\right) + \left(\frac{7}{i-1} + \frac{7*\ i}{2} + \frac{7}{2}\right) + \left(\frac{8}{i-1} + \frac{8*i}{2} + \frac{8}{2}\right) + \cdots \right)$$

$$RHS = \left(\left(-\frac{1}{2}\right) * \left(\frac{-2}{i-1} + \frac{-2\ i}{2} + \frac{-2}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-4}{i-1} + \frac{-4*i}{2} + \frac{-4}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-6}{i-1} + \frac{-6*i}{2} + \frac{-6}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-8}{i-1} + \frac{-8*i}{2} + \frac{-8}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-10}{i-1} + \frac{-10*i}{2} + \frac{-10}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-12}{i-1} + \frac{-12*\ i}{2} + \frac{-12}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-14}{i-1} + \frac{-14*\ i}{2} + \frac{-14}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-16}{i-1} + \frac{-16*i}{2} + \frac{-16}{2}\right) + \cdots \right)$$

$$RHS = \left(-\frac{1}{2}\right) * \left(\left(\frac{-2}{i-1} + \frac{-2\,i}{2} + \frac{-2}{2}\right) + \left(\frac{-4}{i-1} + \frac{-4*i}{2} + \frac{-4}{2}\right) + \left(\frac{-6}{i-1} + \frac{-6*i}{2} + \frac{-6}{2}\right) + \left(\frac{-8}{i-1} + \frac{-8*i}{2} + \frac{-8}{2}\right) + \left(\frac{-10}{i-1} + \frac{-10*i}{2} + \frac{-10}{2}\right) + \left(\frac{-12}{i-1} + \frac{-12*\ i}{2} + \frac{-12}{2}\right) + \left(\frac{-14}{i-1} + \frac{-14*\ i}{2} + \frac{-14}{2}\right) + \left(\frac{-16}{i-1} + \frac{-16*i}{2} + \frac{-16}{2}\right) + \cdots\right) \rightarrow EQ(1.2_9)$$

As each term in RHS = 0 then RHS = 0 because

$$\frac{A}{i-1} + \frac{A*i}{2} + \frac{A}{2} = 0$$

3- *If we can write each natural number in term of a complex number +(0.5) Then we proofed second point in our proof methodology*

$$A = \frac{-A}{i-1} - \frac{A*i}{2} + \frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} + \frac{1}{2} \rightarrow EQ(1.2_{10})$$

$$1 = \frac{-A}{i-1} - \frac{A*i}{2} - \frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} + \frac{1}{2} \rightarrow EQ(1.2_{11})$$

$$0 = \frac{-A}{i-1} - \frac{A*i}{2} - \frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} - \frac{1}{2} \rightarrow EQ(1.2_{12})$$

Table 1. Any Prime numbers [A] can be written as complex number (S + ½)

A	$A = \frac{-A}{i-1} - \frac{A*i}{2} + \frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} + \frac{1}{2}$	$1 = \frac{-A}{i-1} - \frac{A*i}{2} - \frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} + \frac{1}{2}$
1	$1 = \frac{-1}{i-1} - \frac{1*i}{2} + \frac{(0)}{4} + \frac{1}{2}$	$1 = \frac{-1}{i-1} - \frac{1*i}{2} + \frac{-\,(0)}{4} + \frac{1}{2}$
2	$2 = \frac{-2}{i-1} - \frac{2*i}{2} + \frac{(2)}{4} + \frac{1}{2}$	$1 = \frac{-2}{i-1} - \frac{2*i}{2} + \frac{-\,(2)}{4} + \frac{1}{2}$
3	$3 = \frac{-3}{i-1} - \frac{3*i}{2} + \frac{(4)}{4} + \frac{1}{2}$	$1 = \frac{-3}{i-1} - \frac{3*i}{2} + \frac{-(4)}{4} + \frac{1}{2}$
5	$5 = \frac{-5}{i-1} - \frac{5*i}{2} + \frac{(8)}{4} + \frac{1}{2}$	$1 = \frac{-5}{i-1} - \frac{5*i}{2} + \frac{-(8)}{4} + \frac{1}{2}$
7	$7 = \frac{-7}{i-1} - \frac{7*i}{2} + \frac{(12)}{4} + \frac{1}{2}$	$1 = \frac{-7}{i-1} - \frac{7*i}{2} + \frac{-\,(12)}{4} + \frac{1}{2}$
11	$11 = \frac{-11}{i-1} - \frac{11*i}{2} + \frac{(20)}{4} + \frac{1}{2}$	$1 = \frac{-11}{i-1} - \frac{11*i}{2} + \frac{-\,(20)}{4} + \frac{1}{2}$

13	$13 = \frac{-13}{i-1} - \frac{13*i}{2} + \frac{(24)}{4} + \frac{1}{2}$	$1 = \frac{-13}{i-1} - \frac{13*i}{2} + \frac{-(24)}{4} + \frac{1}{2}$
17	$17 = \frac{-17}{i-1} - \frac{17*i}{2} + \frac{(32)}{4} + \frac{1}{2}$	$1 = \frac{-17}{i-1} - \frac{17*i}{2} + \frac{-(32)}{4} + \frac{1}{2}$
19	$19 = \frac{-19}{i-1} - \frac{19*i}{2} + \frac{(36)}{4} + \frac{1}{2}$	$1 = \frac{-19}{i-1} - \frac{19*i}{2} + \frac{-(36)}{4} + \frac{1}{2}$
...		

Table 2. Any Prime numbers [A] can be written as complex number (S + ½) can reach [1/2] and can reach Zero.

A	$0 = \frac{-A}{i-1} - \frac{A*i}{2} - \frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-A}{i-1} - \frac{A*i}{2} + \frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} + \frac{1}{2} - \frac{8*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} - \frac{1}{2}$
1	$0 = \frac{-1}{i-1} - \frac{1*i}{2} - \frac{(0)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-1}{i-1} - \frac{1*i}{2} + \frac{-(0)}{4}$
2	$0 = \frac{-2}{i-1} - \frac{2*i}{2} - \frac{(2)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-2}{i-1} - \frac{2*i}{2} + \frac{-(2)}{4}$
3	$0 = \frac{-3}{i-1} - \frac{3*i}{2} - \frac{(4)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-3}{i-1} - \frac{3*i}{2} + \frac{-(4)}{4}$
5	$0 = \frac{-5}{i-1} - \frac{5*i}{2} - \frac{(8)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-5}{i-1} - \frac{5*i}{2} + \frac{-(8)}{4}$
7	$0 = \frac{-7}{i-1} - \frac{7*i}{2} - \frac{(12)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-7}{i-1} - \frac{7*i}{2} + \frac{-(12)}{4}$
11	$0 = \frac{-11}{i-1} - \frac{11*i}{2} - \frac{(20)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-11}{i-1} - \frac{11*i}{2} + \frac{-(20)}{4}$
13	$0 = \frac{-13}{i-1} - \frac{13*i}{2} - \frac{(24)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-13}{i-1} - \frac{13*i}{2} + \frac{-(24)}{4}$
17	$0 = \frac{-17}{i-1} - \frac{17*i}{2} - \frac{(32)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-17}{i-1} - \frac{17*i}{2} + \frac{-(32)}{4}$
19	$0 = \frac{-19}{i-1} - \frac{19*i}{2} - \frac{(36)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-19}{i-1} - \frac{19*i}{2} + \frac{-(36)}{4}$
...		

Therefore, any Natural number can be written as [complex number + 0.5]

$$A = \frac{-A}{i-1} - \frac{A*i}{2} + \frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4} + \frac{1}{2}$$

consider adding these four series ($EQ(1.2_2)$, $EQ(1.2_3)$, $EQ(1.2_{15})$, $EQ(1.2_{14})$) together.

$$\frac{0}{4}+\frac{2}{4}+\frac{4}{4}+\frac{6}{4}+\frac{8}{4}+\frac{10}{4}+\frac{12}{4}+\frac{16}{4}=\frac{2}{4}*(0+1+2+3+4+\cdots)=\frac{1}{2}*\zeta(-1) \rightarrow EQ(1.2_{13})$$

$$\left(\frac{1}{2}\right)*\zeta(0)=\left(\frac{1}{2}\right)*(1+1+1+1+1+1+1+1+1+\cdots) \rightarrow EQ(1.2_{14})$$

$$\frac{1}{i-1}*\zeta(-1)=\left(\frac{1}{i-1}+\frac{2}{i-1}+\frac{3}{i-1}+\frac{4}{i-1}+\frac{5}{i-1}+\frac{6}{i-1}+\frac{7}{i-1}+\cdots\right) \rightarrow EQ(1.2_2)$$

$$\frac{i}{2}*\zeta(-1)=(\frac{i}{2}+\frac{2*i}{2}+\frac{3*i}{2}+\frac{4*i}{2}+\frac{5*i}{2}+\frac{6*i}{2}+\frac{7*i}{2}+\frac{8*i}{2}+\frac{9*i}{2}+\cdots) \rightarrow EQ(1.2_3)$$

if we added all these 4 equations and the Sum is equal to Zero then we proofed the third point in our proof methodology

$$-EQ(1.2_2) - EQ(1.2_3) - EQ(1.2_{13}) - EQ(1.2_{14}) = 0$$

$$\begin{aligned} RHS = 0 = \Bigg(&\left(\frac{-1}{i-1}-\frac{i}{2}-\frac{0}{4}-\frac{1}{2}\right)+\left(\frac{-2}{i-1}-\frac{2\,i}{2}-\frac{2}{4}-\frac{1}{2}\right)+\left(\frac{-3}{i-1}-\frac{3i}{2}-\frac{4}{4}-\frac{1}{2}\right) \\ &+\left(\frac{-4}{i-1}-\frac{4i}{2}-\frac{6}{4}-\frac{1}{2}\right)+\left(\frac{5}{i-1}-\frac{5i}{2}-\frac{8}{4}-\frac{1}{2}\right)+\left(\frac{6}{i-1}-\frac{6\,i}{2}-\frac{10}{4}-\frac{1}{2}\right) \\ &+\left(\frac{-7}{i-1}-\frac{7\,i}{2}-\frac{12}{4}-\frac{1}{2}\right)+\left(\frac{-8}{i-1}-\frac{8\,i}{2}-\frac{14}{4}-\frac{1}{2}\right)+\cdots\Bigg) \end{aligned}$$

As each term in this RHS = 0 then its sum= 0

$$LHS = \frac{-1}{i-1}*\zeta(-1) - \frac{i}{2}*\zeta(-1) - \frac{1}{2}*\zeta(-1) - \left(\frac{1}{2}\right)*\zeta(0) = RHS = 0$$

$$\left(\frac{-1}{i-1}-\frac{i}{2}\right)*\zeta(-1) - \frac{1}{2}*\left(\zeta(-1)+\zeta(0)\right) = 0$$

$$\left(\frac{1}{2}\right)*\zeta(-1) - \frac{1}{2}*\left(\zeta(-1)+\zeta(0)\right) = 0$$

$$\zeta(-1) = \left(\zeta(-1)+\zeta(0)\right)$$

$$\zeta(0) = -\frac{1}{2} \rightarrow EQ(3)$$

$$\zeta(-1) = \left(\zeta(-1)-\frac{1}{2}\right) \rightarrow EQ(3)$$

And a Zeta function have one pole at [1] then $\zeta(-1)$ have the same pole but (-0.5) i.e., at strip line. By this we proofed all three parts of our proof methodology

and this proof Riemann hypothesis *for* $(S = -1)$

1.4 **Proof Methodology for $\zeta(S)$ at S = 1**

Same method of calculations will be used.

$$\zeta(S) = \sum_{N=1}^{\infty} N^{-S}$$

$$\zeta(1) = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \cdots \rightarrow EQ(1.4_1)$$

1- Multiply both sides of $EQ(1.4_1)$ by $\frac{1}{i-1}$

$$\frac{1}{i-1} * \zeta(1) = \frac{1}{i-1} * (1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \cdots)$$

$$\frac{1}{i-1} * \zeta(1) = \left(\frac{1}{i-1} + \frac{\frac{1}{2}}{i-1} + \frac{\frac{1}{3}}{i-1} + \frac{\frac{1}{4}}{i-1} + \frac{\frac{1}{5}}{i-1} + \frac{\frac{1}{6}}{i-1} + \frac{\frac{1}{7}}{i-1} + \frac{\frac{1}{8}}{i-1} + \cdots \right) \rightarrow EQ(1.4_2)$$

2- Multiply both sides of $EQ(1.4_1)$ by $\frac{i}{2}$

$$\frac{i}{2} * \zeta(1) = \frac{i}{2} * (1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \cdots)$$

$$\frac{i}{2} * \zeta(1) = (\frac{i}{2} + \frac{\frac{1}{2} * i}{2} + \frac{\frac{1}{3} * i}{2} + \frac{\frac{1}{4} * i}{2} + \frac{\frac{1}{5} * i}{2} + \frac{\frac{1}{6} * i}{2} + \frac{\frac{1}{7} * i}{2} + \frac{\frac{1}{8} * i}{2} + \frac{\frac{1}{9} * i}{2} + \cdots) \rightarrow EQ(1.3_3)$$

3- - Multiply both sides of $EQ(1.4_1)$ by $(\frac{1}{2})$

$$\frac{1}{2} * \zeta(1) = (\frac{1}{2} + \frac{\frac{1}{2}}{2} + \frac{\frac{1}{3}}{2} + \frac{\frac{1}{4}}{2} + \frac{\frac{1}{5}}{2} + \frac{\frac{1}{6}}{2} + \frac{\frac{1}{7}}{2} + \frac{\frac{1}{8}}{2} + \frac{\frac{1}{9}}{2} + \cdots) \rightarrow EQ(1.4_4)$$

Add all three equations together $EQ(1.4_2)$ *and* $EQ(1.4_3)$ *and* $EQ(1.4_4)$
Then we need to find that in the Right-hand side; if we can rewrite all the number as (0.5 + some imaginary number) and all added together equal to 0 in the Right-hand side, then this proofs first point in our proof methodology.

Left-hand side of $EQ(1.4_2) + EQ(1.4_3) + EQ(1.4_4)$.

$$LHS = \frac{1}{i-1} * \zeta(1) + \frac{i}{2} * \zeta(1) + \frac{1}{2} * \zeta(1)$$

$$LHS = \left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) * \zeta(1) = \left(\zeta(0) + \frac{1}{2}\right) * \zeta(1) = 0 * \zeta(1) = 0 \rightarrow EQ(1.4_5)$$

The Right-hand side of $EQ(1.4_2) + \ EQ(1.4_3) + \ EQ(1.4_4)$

$$RHS = \left(\frac{1}{i-1} + \frac{\frac{1}{2}}{i-1} + \frac{\frac{1}{3}}{i-1} + \frac{\frac{1}{4}}{i-1} + \frac{\frac{1}{5}}{i-1} + \frac{\frac{1}{6}}{i-1} + \frac{\frac{1}{7}}{i-1} + \frac{\frac{1}{8}}{i-1} + \cdots \right)$$
$$+ \left(\frac{i}{2} + \frac{\frac{1}{2} * i}{2} + \frac{\frac{1}{3} * i}{2} + \frac{\frac{1}{4} * i}{2} + \frac{\frac{1}{5} * i}{2} + \frac{\frac{1}{6} * i}{2} + \frac{\frac{1}{7} * i}{2} + \frac{\frac{1}{8} * i}{2} + \frac{\frac{1}{9} * i}{2} + \cdots \right)$$
$$+ \left(\frac{1}{2} + \frac{\frac{1}{2}}{2} + \frac{\frac{1}{3}}{2} + \frac{\frac{1}{4}}{2} + \frac{\frac{1}{5}}{2} + \frac{\frac{1}{6}}{2} + \frac{\frac{1}{7}}{2} + \frac{\frac{1}{8}}{2} + \frac{\frac{1}{9}}{2} + \cdots \right)$$

$$re\ arrange\ all\ the\ terms$$

$$RHS = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{2}}{i-1} + \frac{\frac{1}{2} * i}{2} + \frac{\frac{1}{2}}{2} \right) + \left(\frac{\frac{1}{3}}{i-1} + \frac{\frac{1}{3} * i}{2} + \frac{\frac{1}{3}}{2} \right) \right.$$
$$+ \left(\frac{\frac{1}{4}}{i-1} + \frac{\frac{1}{4} * i}{2} + \frac{\frac{1}{4}}{2} \right) + \left(\frac{\frac{1}{5}}{i-1} + \frac{\frac{1}{5} * i}{2} + \frac{\frac{1}{5}}{2} \right) + \left(\frac{\frac{1}{6}}{i-1} + \frac{\frac{1}{6} * i}{2} + \frac{\frac{1}{6}}{2} \right)$$
$$\left. + \left(\frac{\frac{1}{7}}{i-1} + \frac{\frac{1}{7} * i}{2} + \frac{\frac{1}{7}}{2} \right) + \left(\frac{\frac{1}{8}}{i-1} + \frac{\frac{1}{8} * i}{2} + \frac{\frac{1}{8}}{2} \right) + \cdots \right) = 0 \rightarrow EQ(1.4_6)$$

We can generalize EQ (1) by multiply both sides by A

$$\frac{A}{i-1} + \frac{A * i}{2} = -\frac{A}{2}$$
$$\frac{A}{i-1} + \frac{A * i}{2} + \frac{A}{2} = 0 \rightarrow EQ(1.2_7)$$

$$Then\ from\ \ EQ(1.2_7)\ each\ term\ in\ EQ(1.4_6)\ will\ be\ 0$$
$$which\ means\ that\ RHS = 0$$

4- *If we looked at each term in,* $EQ(1.4_6)$ *we can rewrite it as (some complex number + 0.5) and still RHS = 0*

$$RHS = 0 = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{2}}{i-1} + \frac{\frac{1}{2}*i}{2} - \frac{\frac{1}{2}}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{3}}{i-1} + \frac{\frac{1}{3}*i}{2} - \frac{\frac{2}{3}}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{4}}{i-1} + \frac{\frac{1}{4}*i}{2} - \frac{\frac{3}{4}}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{5}}{i-1} + \frac{\frac{1}{5}*i}{2} - \frac{\frac{4}{5}}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{6}}{i-1} + \frac{\frac{1}{6}*i}{2} - \frac{\frac{5}{6}}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{7}}{i-1} + \frac{\frac{1}{7}*i}{2} - \frac{\frac{6}{7}}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{8}}{i-1} + \frac{\frac{1}{8}*i}{2} - \frac{\frac{7}{8}}{2} + \frac{1}{2}\right) + \cdots \right) \rightarrow EQ(1.4_7)$$

5- *If we looked at each term in,* $EQ(1.4_6)$ *we can rewrite it as, (-0.5) * (some complex number) and still RHS = 0*

$$RHS = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{2}}{i-1} + \frac{\frac{1}{2}*i}{2} + \frac{\frac{1}{2}}{2}\right) + \left(\frac{\frac{1}{3}}{i-1} + \frac{\frac{1}{3}*i}{2} + \frac{\frac{1}{3}}{2}\right) + \left(\frac{\frac{1}{4}}{i-1} + \frac{\frac{1}{4}*i}{2} + \frac{\frac{1}{4}}{2}\right) + \left(\frac{\frac{1}{5}}{i-1} + \frac{\frac{1}{5}*i}{2} + \frac{\frac{1}{5}}{2}\right) + \left(\frac{\frac{1}{6}}{i-1} + \frac{\frac{1}{6}*i}{2} + \frac{\frac{1}{6}}{2}\right) + \left(\frac{\frac{1}{7}}{i-1} + \frac{\frac{1}{7}*i}{2} + \frac{\frac{1}{7}}{2}\right) + \left(\frac{\frac{1}{8}}{i-1} + \frac{\frac{1}{8}*i}{2} + \frac{\frac{1}{8}}{2}\right) + \cdots \right) = 0$$

$$RHS = \left(\left(-\frac{1}{2}\right) * \left(\frac{-2}{i-1} + \frac{-2\,i}{2} + \frac{-2}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{1}{4}}{i-1} + \frac{-\frac{1}{4}*i}{2} + \frac{-\frac{1}{4}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{1}{6}}{i-1} + \frac{-\frac{1}{6}*i}{2} + \frac{-\frac{1}{6}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{1}{8}}{i-1} + \frac{-\frac{1}{8}*i}{2} + \frac{-\frac{1}{8}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{1}{10}}{i-1} + \frac{-\frac{1}{10}*i}{2} + \frac{-\frac{1}{10}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{1}{12}}{i-1} + \frac{-\frac{1}{12}*i}{2} + \frac{-\frac{1}{12}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{1}{14}}{i-1} + \frac{-\frac{1}{14}*i}{2} + \frac{-\frac{1}{14}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{1}{16}}{i-1} + \frac{-\frac{1}{16}*i}{2} + \frac{-\frac{1}{16}}{2}\right) + \cdots \right)$$

$$RHS = \left(-\frac{1}{2}\right) * \left(\left(\frac{-2}{i-1} + \frac{-2\,i}{2} + \frac{-2}{2}\right) + \left(\frac{-\frac{1}{4}}{i-1} + \frac{-\frac{1}{4} * i}{2} + \frac{-\frac{1}{4}}{2}\right) + \left(\frac{-\frac{1}{6}}{i-1} + \frac{-\frac{1}{6} * i}{2} + \frac{-\frac{1}{6}}{2}\right) + \left(\frac{-\frac{1}{8}}{i-1} + \frac{-\frac{1}{8} * i}{2} + \frac{-\frac{1}{8}}{2}\right) + \left(\frac{-\frac{1}{10}}{i-1} + \frac{-\frac{1}{10} * i}{2} + \frac{-\frac{1}{10}}{2}\right) + \left(\frac{-\frac{1}{12}}{i-1} + \frac{-\frac{1}{12} * i}{2} + \frac{-\frac{1}{12}}{2}\right) + \left(\frac{-\frac{1}{14}}{i-1} + \frac{-\frac{1}{14} * i}{2} + \frac{-\frac{1}{14}}{2}\right) + \left(\frac{-\frac{1}{16}}{i-1} + \frac{-\frac{1}{16} * i}{2} + \frac{-\frac{1}{16}}{2}\right) + \cdots \right) \rightarrow EQ(1.4_8)$$

As each term in RHS = 0 then Sum = 0; because

$$\frac{A}{i-1} + \frac{A * i}{2} + \frac{A}{2} = 0$$

6- *If we can write each natural number in term of a complex number +(0.5) Then we proofed second point in our proof methodology*

$$A = \frac{-A}{i-1} - \frac{A * i}{2} + \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2} \rightarrow EQ(1.2_{10})$$

$$1 = \frac{-A}{i-1} - \frac{A * i}{2} - \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2} \rightarrow EQ(1.2_{11})$$

$$0 = \frac{-A}{i-1} - \frac{A * i}{2} - \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} - \frac{1}{2} \rightarrow EQ(1.2_{12})$$

Table 3. Any Prime numbers [A] can be written as complex number (S + ½)

A	$0 = \frac{-A}{i-1} - \frac{A * i}{2} - \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} - \frac{1}{2}$	$A = \frac{-A}{i-1} - \frac{A * i}{2} + \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2}$
1	$0 = \frac{-1}{i-1} - \frac{1 * i}{2} - \frac{(0)}{4} - \frac{1}{2}$	$1 = \frac{-1}{i-1} - \frac{1 * i}{2} + \frac{-(0)}{4} + \frac{1}{2}$
$\boldsymbol{\frac{1}{2}}$	$0 = \frac{-\frac{1}{2}}{i-1} - \frac{\frac{1}{2} * i}{2} - \frac{4 * \left(\frac{\frac{1}{2}}{2} - \frac{1}{2}\right)}{4} - \frac{1}{2}$	$\frac{1}{2} = \frac{-\frac{1}{2}}{i-1} - \frac{\frac{1}{2} * i}{2} + \frac{4 * \left(\frac{\frac{1}{2}}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2}$

$\mathbf{\frac{1}{3}}$	$0 = \frac{-\frac{1}{3}}{i-1} - \frac{\frac{1}{3} * i}{2} - \frac{4 * \left(\left(\frac{\frac{1}{3}}{2} - \frac{1}{2}\right)\right)}{4} - \frac{1}{2}$	$\frac{1}{3} = \frac{-\frac{1}{3}}{i-1} - \frac{\frac{1}{3} * i}{2} + \frac{4 * \left(\left(\frac{\frac{1}{3}}{2} - \frac{1}{2}\right)\right)}{4} + \frac{1}{2}$
$\mathbf{\frac{1}{5}}$	$0 = \frac{-\frac{1}{5}}{i-1} - \frac{\frac{1}{5} * i}{2} - \frac{4 * \left(\left(\frac{\frac{1}{5}}{2} - \frac{1}{2}\right)\right)}{4} - \frac{1}{2}$	$\frac{1}{5} = \frac{-\frac{1}{5}}{i-1} - \frac{\frac{1}{5} * i}{2} + \frac{4 * \left(\left(\frac{\frac{1}{5}}{2} - \frac{1}{2}\right)\right)}{4} + \frac{1}{2}$
$\mathbf{\frac{1}{7}}$	$0 = \frac{-\frac{1}{7}}{i-1} - \frac{\frac{1}{7} * i}{2} - \frac{4 * \left(\left(\frac{\frac{1}{7}}{2} - \frac{1}{2}\right)\right)}{4} - \frac{1}{2}$	$\frac{1}{7} = \frac{-\frac{1}{7}}{i-1} - \frac{\frac{1}{7} * i}{2} + \frac{4 * \left(\left(\frac{\frac{1}{7}}{2} - \frac{1}{2}\right)\right)}{4} + \frac{1}{2}$
$\mathbf{\frac{1}{11}}$	$0 = \frac{-\frac{1}{11}}{i-1} - \frac{\frac{1}{11} * i}{2} - \frac{4 * \left(\left(\frac{\frac{1}{11}}{2} - \frac{1}{2}\right)\right)}{4} - \frac{1}{2}$	$\frac{1}{11} = \frac{-\frac{1}{11}}{i-1} - \frac{\frac{1}{11} * i}{2} + \frac{4 * \left(\left(\frac{\frac{1}{11}}{2} - \frac{1}{2}\right)\right)}{4} + \frac{1}{2}$
$\mathbf{\frac{1}{13}}$	$0 = \frac{-\frac{1}{13}}{i-1} - \frac{\frac{1}{13} * i}{2} - \frac{4 * \left(\left(\frac{\frac{1}{13}}{2} - \frac{1}{2}\right)\right)}{4} - \frac{1}{2}$	$\frac{1}{13} = \frac{-\frac{1}{13}}{i-1} - \frac{\frac{1}{13} * i}{2} + \frac{4 * \left(\left(\frac{\frac{1}{13}}{2} - \frac{1}{2}\right)\right)}{4} + \frac{1}{2}$
$\mathbf{\frac{1}{17}}$	$0 = \frac{-\frac{1}{17}}{i-1} - \frac{\frac{1}{17} * i}{2} - \frac{4 * \left(\left(\frac{\frac{1}{17}}{2} - \frac{1}{2}\right)\right)}{4} - \frac{1}{2}$	$\frac{1}{17} = \frac{-\frac{1}{17}}{i-1} - \frac{\frac{1}{17} * i}{2} + \frac{4 * \left(\left(\frac{\frac{1}{17}}{2} - \frac{1}{2}\right)\right)}{4} + \frac{1}{2}$
$\mathbf{\frac{1}{19}}$	$0 = \frac{-\frac{1}{19}}{i-1} - \frac{\frac{1}{19} * i}{2} - \frac{4 * \left(\left(\frac{\frac{1}{19}}{2} - \frac{1}{2}\right)\right)}{4} - \frac{1}{2}$	$\frac{1}{19} = \frac{-\frac{1}{19}}{i-1} - \frac{\frac{1}{19} * i}{2} + \frac{4 * \left(\left(\frac{\frac{1}{19}}{2} - \frac{1}{2}\right)\right)}{4} + \frac{1}{2}$
...		

Therefore, any Natural number can be written as [complex number + 0.5]

$$A = \frac{-A}{i-1} - \frac{A * i}{2} + \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2}$$

consider adding these four series ($EQ(1.4_2)$, $EQ(1.4_3)$, $EQ(1.4_9)$, $EQ(1.4_{10})$) together

$$\frac{4*(\frac{1}{2}-\frac{1}{2})}{4}+\frac{4*\left(\frac{\frac{1}{2}}{2}-\frac{1}{2}\right)}{4}+\frac{4*\left(\frac{\frac{1}{3}}{2}-\frac{1}{2}\right)}{4}+\frac{4*\left(\frac{\frac{1}{4}}{2}-\frac{1}{2}\right)}{4}+\frac{4*\left(\frac{\frac{1}{5}}{2}-\frac{1}{2}\right)}{4}+\cdots$$

$$=\frac{2}{4}*\left(0+\left(\frac{1}{2}-1\right)+\left(\frac{1}{3}-1\right)+\left(\frac{1}{4}-1\right)+\left(\frac{1}{5}-1\right)+\left(\frac{1}{6}-1\right)+\cdots\right)$$

$$=\frac{1}{2}*(\zeta(1)-\zeta(0)-1) \rightarrow EQ(1.4_9)$$

$$\left(\frac{1}{2}\right)*\ \zeta(0)=\left(\frac{1}{2}\right)*(1+1+1+1+1+1+1+1+1+\cdots)\rightarrow EQ(1.4_{10})$$

$$\frac{1}{i-1}*\zeta(1)=\left(\frac{1}{i-1}+\frac{\frac{1}{2}}{i-1}+\frac{\frac{1}{3}}{i-1}+\frac{\frac{1}{4}}{i-1}+\frac{\frac{1}{5}}{i-1}+\frac{\frac{1}{6}}{i-1}+\frac{\frac{1}{7}}{i-1}+\cdots\right)\rightarrow EQ(1.4_2)$$

$$\frac{i}{2}*\zeta(1)=(\frac{i}{2}+\frac{\frac{1}{2}*i}{2}+\frac{\frac{1}{3}*i}{2}+\frac{\frac{1}{4}*i}{2}+\frac{\frac{1}{5}*i}{2}+\frac{\frac{1}{6}*\ i}{2}+\frac{\frac{1}{7}*\ i}{2}+\frac{\frac{1}{8}*i}{2}+\frac{\frac{1}{9}*i}{2}+\cdots)\rightarrow EQ(1.4_3)$$

if we added all these 4 equations and the Sum is equal to Zero then we proofed the third point in our proof methodology

$$-EQ(1.4_2)-\ EQ(1.4_3)+EQ(1.4_9)+EQ(1.4_{10})=\zeta(1)$$

$$RHS=\ \zeta(1)=\left(\left(\frac{-1}{i-1}-\frac{i}{2}+\frac{0}{4}+\frac{1}{2}\right)+\left(\frac{-\frac{1}{2}}{i-1}-\frac{\frac{1}{2}\,i}{2}+\frac{2*\frac{1}{2}-2}{4}+\frac{1}{2}\right)\right.$$
$$+\left(\frac{-\frac{1}{3}}{i-1}-\frac{\frac{1}{3}i}{2}+\frac{2*\frac{1}{3}-2}{4}+\frac{1}{2}\right)+\left(\frac{-\frac{1}{4}}{i-1}-\frac{\frac{1}{4}i}{2}+\frac{2*\frac{1}{4}-2}{4}+\frac{1}{2}\right)$$
$$+\left(\frac{-\frac{1}{5}}{i-1}-\frac{\frac{1}{5}i}{2}+\frac{2*\frac{1}{5}-2}{4}+\frac{1}{2}\right)+\left(\frac{\frac{-1}{6}}{i-1}-\frac{\frac{1}{6}\,i}{2}+\frac{2*\frac{1}{6}-2}{4}+\frac{1}{2}\right)$$
$$\left.+\left(\frac{-\frac{1}{7}}{i-1}-\frac{\frac{1}{7}\,i}{2}+\frac{2*\frac{1}{7}-2}{4}+\frac{1}{2}\right)+\left(\frac{-\frac{1}{8}}{i-1}-\frac{\frac{1}{8}\,i}{2}+\frac{2*\frac{1}{8}}{4}+\frac{1}{2}\right)+\cdots\right)$$

$$LHS=\frac{-1}{i-1}*\zeta(1)-\ \frac{i}{2}*\zeta(1)+\frac{1}{2}*(\zeta(1)-\zeta(0)-1)+\ \left(\frac{1}{2}\right)*\ \zeta(0)=\zeta(1)$$

$$\frac{-1}{i-1}*\zeta(1)-\ \frac{i}{2}*\zeta(1)+\frac{1}{2}*(\zeta(1)-\zeta(0)-1)+\ \left(\frac{1}{2}\right)*\ \zeta(0)=\zeta(1)$$

$$\left(\frac{-1}{i-1}-\ \frac{i}{2}\right)*\zeta(1)+\frac{1}{2}*\zeta(1)-\frac{1}{2}=\zeta(-1)$$

$$\zeta(1)=\ \left(\zeta(1)-\frac{1}{2}\right)\ \rightarrow EQ(3)$$

And a Zeta function have one pole at [1] then $\zeta(1)$ *have the same pole but (-0.5) i.e., at strip line.* By this we proofed all three parts of our proof methodology

$$and\ this\ proof\ \text{Riemann hypothesis}\ \ for\ (S=\ 1)$$

1.5 Case (3): $\zeta(S)$ for any S

Using the same calculations

$$\zeta(S) = \sum_{N=1}^{\infty} N^{-S}$$

$$\zeta(S) = 1 + \frac{1}{2^S} + \frac{1}{3^S} + \frac{1}{4^S} + \frac{1}{5^S} + \frac{1}{6^S} + \frac{1}{7^S} + \frac{1}{8^S} + \frac{1}{9^S} + \cdots \rightarrow EQ(1.5_1)$$

1- Multiply both sides of $EQ(1.5_1)$ by $\frac{1}{i-1}$

$$\frac{1}{i-1} * \zeta(S) = \left(\frac{1}{i-1} + \frac{\frac{1}{2^S}}{i-1} + \frac{\frac{1}{3^S}}{i-1} + \frac{\frac{1}{4^S}}{i-1} + \frac{\frac{1}{5^S}}{i-1} + \frac{\frac{1}{6^S}}{i-1} + \frac{\frac{1}{7^S}}{i-1} + \frac{\frac{1}{8^S}}{i-1} + \cdots \right) \rightarrow EQ(1.5_2)$$

2- Multiply both sides of $EQ(1.5_1)$ by $\frac{i}{2}$

$$\frac{i}{2} * \zeta(S) = (\frac{i}{2} + \frac{\frac{1}{2^S} * i}{2} + \frac{\frac{1}{3^S} * i}{2} + \frac{\frac{1}{4^S} * i}{2} + \frac{\frac{1}{5^S} * i}{2} + \frac{\frac{1}{6^S} * i}{2} + \frac{\frac{1}{7^S} * i}{2} + \frac{\frac{1}{8^S} * i}{2} + \cdots) \rightarrow EQ(1.5_3)$$

3- - Multiply both sides of $EQ(1.4_1)$ by $(\frac{1}{2})$

$$\frac{1}{2} * \zeta(S) = (\frac{1}{2} + \frac{\frac{1}{2^S}}{2} + \frac{\frac{1}{3^S}}{2} + \frac{\frac{1}{4^S}}{2} + \frac{\frac{1}{5^S}}{2} + \frac{\frac{1}{6^S}}{2} + \frac{\frac{1}{7^S}}{2} + \frac{\frac{1}{8^S}}{2} + \frac{\frac{1}{9^S}}{2} + \cdots) \rightarrow EQ(1.5_4)$$

Add all three equations together $EQ(1.5_2)$ and $EQ(1.5_3)$ and $EQ(1.5_4)$
Then we need to find that in the Right-hand side; if we can rewrite all the number as (0.5 + some imaginary number) and all added together equal to 0 in the Right-hand side, then this proofs first point in our proof methodology.

Left-hand side of $EQ(1.5_2) + EQ(1.5_3) + EQ(1.5_4)$.

$$LHS = \frac{1}{i-1} * \zeta(S) + \frac{i}{2} * \zeta(S) + \frac{1}{2} * \zeta(S)$$

$$LHS = \left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) * \zeta(S) = \left(\zeta(0) + \frac{1}{2}\right) * \zeta(S) = 0 * \zeta(S) = 0 \rightarrow EQ(1.5_5)$$

The Right-hand side $EQ(1.5_2) + EQ(1.5_3) + EQ(1.5_4)$.

$$RHS = \left(\frac{1}{i-1} + \frac{\frac{1}{2^S}}{i-1} + \frac{\frac{1}{3^S}}{i-1} + \frac{\frac{1}{4^S}}{i-1} + \frac{\frac{1}{5^S}}{i-1} + \frac{\frac{1}{6^S}}{i-1} + \frac{\frac{1}{7^S}}{i-1} + \frac{\frac{1}{8^S}}{i-1} + \cdots \right) + \left(\frac{i}{2} + \frac{\frac{1}{2^S} * i}{2} + \frac{\frac{1}{3^S} * i}{2} + \frac{\frac{1}{4^S} * i}{2} + \frac{\frac{1}{5^S} * i}{2} + \frac{\frac{1}{6^S} * i}{2} + \frac{\frac{1}{7^S} * i}{2} + \frac{\frac{1}{8^S} * i}{2} + \frac{\frac{1}{9^S} * i}{2} + \cdots \right) + \left(\frac{1}{2} + \frac{\frac{1}{2^S}}{2} + \frac{\frac{1}{3^S}}{2} + \frac{\frac{1}{4^S}}{2} + \frac{\frac{1}{5^S}}{2} + \frac{\frac{1}{6^S}}{2} + \frac{\frac{1}{7^S}}{2} + \frac{\frac{1}{8^S}}{2} + \frac{\frac{1}{9^S}}{2} + \cdots \right)$$

$$re\ arrange\ all\ the\ terms$$

$$RHS = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2} \right) + \left(\frac{\frac{1}{2^S}}{i-1} + \frac{\frac{1}{2^S} * i}{2} + \frac{\frac{1}{2^S}}{2} \right) + \left(\frac{\frac{1}{3^S}}{i-1} + \frac{\frac{1}{3^S} * i}{2} + \frac{\frac{1}{3^S}}{2} \right) + \left(\frac{\frac{1}{4^S}}{i-1} + \frac{\frac{1}{4^S} * i}{2} + \frac{\frac{1}{4^S}}{2} \right) + \left(\frac{\frac{1}{5^S}}{i-1} + \frac{\frac{1}{5^S} * i}{2} + \frac{\frac{1}{5^S}}{2} \right) + \left(\frac{\frac{1}{6^S}}{i-1} + \frac{\frac{1}{6^S} * i}{2} + \frac{\frac{1}{6^S}}{2} \right) + \left(\frac{\frac{1}{7^S}}{i-1} + \frac{\frac{1}{7^S} * i}{2} + \frac{\frac{1}{7^S}}{2} \right) + \left(\frac{\frac{1}{8^S}}{i-1} + \frac{\frac{1}{8^S} * i}{2} + \frac{\frac{1}{8^S}}{2} \right) + \cdots \right) = 0 \rightarrow EQ(1.5_6)$$

We can generalize EQ (1) by multiply both sides by A

$$\frac{A}{i-1} + \frac{A * i}{2} = -\frac{A}{2}$$

$$\frac{A}{i-1} + \frac{A * i}{2} + \frac{A}{2} = 0 \rightarrow EQ(1.2_7)$$

$$Then\ from\ EQ(1.2_7)\ each\ term\ in\ EQ(1.4_6)\ will\ be\ 0$$
$$which\ means\ that\ RHS = 0$$

4- *If we looked at each term in,* $EQ(1.5_6)$ *we can rewrite it as (some complex number + 0.5) and still RHS = 0*

$$RHS = 0 = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{2^S}}{i-1} + \frac{\frac{1}{2^S} * i}{2} + \frac{(\frac{1}{2^S} - 1)}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{3^S}}{i-1} + \frac{\frac{1}{3^S} * i}{2} + \frac{(\frac{1}{3^S} - 1)}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{4^S}}{i-1} + \frac{\frac{1}{4^S} * i}{2} + \frac{\left(\frac{1}{4^S} - 1\right)}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{5^S}}{i-1} + \frac{\frac{1}{5^S} * i}{2} + \frac{\left(\frac{1}{5^S} - 1\right)}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{6^S}}{i-1} + \frac{\frac{1}{6^S} * i}{2} + \frac{\left(\frac{1}{6^S} - 1\right)}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{7^S}}{i-1} + \frac{\frac{1}{7^S} * i}{2} + \frac{\left(\frac{1}{7^S} - 1\right)}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{8^S}}{i-1} + \frac{\frac{1}{8^S} * i}{2} + \frac{\left(\frac{1}{8^S} - 1\right)}{2} + \frac{1}{2}\right) + \cdots \right) \rightarrow EQ(1.5_7)$$

5- *If we looked at each term in,* $EQ(1.5_6)$ *we can rewrite it as, (-0.5) * (some complex number) and still RHS = 0*

$$RHS = 0 = \left(\left(\frac{1}{i-1} + \frac{i}{2} + \frac{1}{2}\right) + \left(\frac{\frac{1}{2^S}}{i-1} + \frac{\frac{1}{2^S} * i}{2} + \frac{\frac{1}{2^S}}{2}\right) + \left(\frac{\frac{1}{3^S}}{i-1} + \frac{\frac{1}{3^S} * i}{2} + \frac{\frac{1}{3^S}}{2}\right) + \left(\frac{\frac{1}{4^S}}{i-1} + \frac{\frac{1}{4^S} * i}{2} + \frac{\frac{1}{4^S}}{2}\right) + \left(\frac{\frac{1}{5^S}}{i-1} + \frac{\frac{1}{5^S} * i}{2} + \frac{\frac{1}{5^S}}{2}\right) + \left(\frac{\frac{1}{6^S}}{i-1} + \frac{\frac{1}{6^S} * i}{2} + \frac{\frac{1}{6^S}}{2}\right) + \left(\frac{\frac{1}{7^S}}{i-1} + \frac{\frac{1}{7^S} * i}{2} + \frac{\frac{1}{7^S}}{2}\right) + \left(\frac{\frac{1}{8^S}}{i-1} + \frac{\frac{1}{8^S} * i}{2} + \frac{\frac{1}{8^S}}{2}\right) + \cdots \right)$$

$$RHS = \left(\left(-\frac{1}{2}\right) * \left(\frac{-2}{i-1} + \frac{-2\,i}{2} + \frac{-2}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{2}{2^S}}{i-1} + \frac{-\frac{2}{2^S} * i}{2} + \frac{-\frac{2}{2^S}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{2}{3^S}}{i-1} + \frac{-\frac{2}{3^S} * i}{2} + \frac{-\frac{2}{3^S}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{2}{4^S}}{i-1} + \frac{-\frac{2}{4^S} * i}{2} + \frac{-\frac{2}{4^S}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{2}{5^S}}{i-1} + \frac{-\frac{2}{5^S} * i}{2} + \frac{-\frac{2}{5^S}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{2}{6^S}}{i-1} + \frac{-\frac{2}{6^S} * i}{2} + \frac{-\frac{2}{6^S}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{2}{7^S}}{i-1} + \frac{-\frac{2}{7^S} * i}{2} + \frac{-\frac{2}{7^S}}{2}\right) + \left(-\frac{1}{2}\right) * \left(\frac{-\frac{2}{8^S}}{i-1} + \frac{-\frac{2}{8^S} * i}{2} + \frac{-\frac{2}{8^S}}{2}\right) + \cdots \right)$$

$$RHS = \left(-\frac{1}{2}\right) * \left(\left(\frac{-2}{i-1} + \frac{-2\,i}{2} + \frac{-2}{2}\right) + \left(\frac{-\frac{2}{2^S}}{i-1} + \frac{-\frac{2}{2^S} * i}{2} + \frac{-\frac{2}{2^S}}{2}\right) + \left(\frac{-\frac{2}{3^S}}{i-1} + \frac{-\frac{2}{3^S} * i}{2} + \frac{-\frac{2}{3^S}}{2}\right) + \left(\frac{-\frac{2}{4^S}}{i-1} + \frac{-\frac{2}{4^S} * i}{2} + \frac{-\frac{2}{4^S}}{2}\right) + \left(\frac{-\frac{2}{5^S}}{i-1} + \frac{-\frac{2}{5^S} * i}{2} + \frac{-\frac{2}{5^S}}{2}\right) + \left(\frac{-\frac{2}{6^S}}{i-1} + \frac{-\frac{2}{6^S} * i}{2} + \frac{-\frac{2}{6^S}}{2}\right) + \left(\frac{-\frac{2}{7^S}}{i-1} + \frac{-\frac{2}{7^S} * i}{2} + \frac{-\frac{2}{7^S}}{2}\right) + \left(\frac{-\frac{2}{8^S}}{i-1} + \frac{-\frac{2}{8^S} * i}{2} + \frac{-\frac{2}{8^S}}{2}\right) \right) \Rightarrow EQ(1.5_8)$$

$$\frac{A}{i-1} + \frac{A * i}{2} + \frac{A}{2} = 0 \Rightarrow EQ(1.2_7)$$

$$RHS = \left(-\frac{1}{2}\right) * 0$$

6- *If we can write each natural number in term of a complex number +(0.5) Then we proofed second point in our proof methodology*

$$A = \frac{-A}{i-1} - \frac{A * i}{2} + \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2} \Rightarrow EQ(1.2_{10})$$

$$1 = \frac{-A}{i-1} - \frac{A * i}{2} - \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2} \Rightarrow EQ(1.2_{11})$$

$$0 = \frac{-A}{i-1} - \frac{A * i}{2} - \frac{4 * \left(\frac{A}{2} - \frac{1}{2}\right)}{4} - \frac{1}{2} \Rightarrow EQ(1.2_{12})$$

Table 3. Any Prime numbers [A] can be written as complex number (S + ½)

A^S	$0 = \frac{-A^S}{i-1} - \frac{A^S * i}{2} - \frac{4 * \left(\frac{A^S}{2} - \frac{1}{2}\right)}{4} - \frac{1}{2}$	$A^S = \frac{-A^S}{i-1} - \frac{A^S * i}{2} + \frac{4 * \left(\frac{A^S}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2}$
1	$0 = \frac{-1}{i-1} - \frac{1 * i}{2} - \frac{(0)}{4} - \frac{1}{2}$	$1 = \frac{-1}{i-1} - \frac{1 * i}{2} + \frac{-(0)}{4} + \frac{1}{2}$
$\boldsymbol{\frac{1}{2^S}}$	$0 = \frac{-\frac{1}{2^S}}{i-1} - \frac{\frac{1}{2^S} * i}{2} - \frac{4 * \left(\frac{\frac{1}{2^S}}{2} - \frac{1}{2}\right)}{4} - \frac{1}{2}$	$\frac{1}{2^S} = \frac{-\frac{1}{2^S}}{i-1} - \frac{\frac{1}{2^S} * i}{2} + \frac{4 * \left(\frac{\frac{1}{2^S}}{2} - \frac{1}{2}\right)}{4} + \frac{1}{2}$

$\mathbf{\frac{1}{3^S}}$	$0=\frac{-\frac{1}{3^S}}{i-1}-\frac{\frac{1}{3^S}*i}{2}-\frac{4*\left(\left(\frac{\frac{1}{3^S}}{2}-\frac{1}{2}\right)\right)}{4}-\frac{1}{2}$	$\frac{1}{3^S}=\frac{-\frac{1}{3^S}}{i-1}-\frac{\frac{1}{3^S}*i}{2}+\frac{4*\left(\left(\frac{\frac{1}{3^S}}{2}-\frac{1}{2}\right)\right)}{4}+\frac{1}{2}$
$\mathbf{\frac{1}{5^S}}$	$0=\frac{-\frac{1}{5^S}}{i-1}-\frac{\frac{1}{5^S}*i}{2}-\frac{4*\left(\left(\frac{\frac{1}{5^S}}{2}-\frac{1}{2}\right)\right)}{4}-\frac{1}{2}$	$\frac{1}{5^S}=\frac{-\frac{1}{5^S}}{i-1}-\frac{\frac{1}{5^S}*i}{2}+\frac{4*\left(\left(\frac{\frac{1}{5^S}}{2}-\frac{1}{2}\right)\right)}{4}+\frac{1}{2}$
$\mathbf{\frac{1}{7^S}}$	$0=\frac{-\frac{1}{7^S}}{i-1}-\frac{\frac{1}{7^S}*i}{2}-\frac{4*\left(\left(\frac{\frac{1}{7^S}}{2}-\frac{1}{2}\right)\right)}{4}-\frac{1}{2}$	$\frac{1}{7^S}=\frac{-\frac{1}{7^S}}{i-1}-\frac{\frac{1}{7^S}*i}{2}+\frac{4*\left(\left(\frac{\frac{1}{7^S}}{2}-\frac{1}{2}\right)\right)}{4}+\frac{1}{2}$
$\mathbf{\frac{1}{11^S}}$	$0=\frac{-\frac{1}{11^S}}{i-1}-\frac{\frac{1}{11^S}*i}{2}-\frac{4*\left(\left(\frac{\frac{1}{11^S}}{2}-\frac{1}{2}\right)\right)}{4}-\frac{1}{2}$	$\frac{1}{11^S}=\frac{-\frac{1}{11^S}}{i-1}-\frac{\frac{1}{11^S}*i}{2}+\frac{4*\left(\left(\frac{\frac{1}{11^S}}{2}-\frac{1}{2}\right)\right)}{4}+\frac{1}{2}$
$\mathbf{\frac{1}{13^S}}$	$0=\frac{-\frac{1}{13^S}}{i-1}-\frac{\frac{1}{13^S}*i}{2}-\frac{4*\left(\left(\frac{\frac{1}{13^S}}{2}-\frac{1}{2}\right)\right)}{4}-\frac{1}{2}$	$\frac{1}{13^S}=\frac{-\frac{1}{13^S}}{i-1}-\frac{\frac{1}{13^S}*i}{2}+\frac{4*\left(\left(\frac{\frac{1}{13^S}}{2}-\frac{1}{2}\right)\right)}{4}+\frac{1}{2}$
$\mathbf{\frac{1}{17^S}}$	$0=\frac{-\frac{1}{17^S}}{i-1}-\frac{\frac{1}{17^S}*i}{2}-\frac{4*\left(\left(\frac{\frac{1}{17^S}}{2}-\frac{1}{2}\right)\right)}{4}-\frac{1}{2}$	$\frac{1}{17^S}=\frac{-\frac{1}{17^S}}{i-1}-\frac{\frac{1}{17^S}*i}{2}+\frac{4*\left(\left(\frac{\frac{1}{17^S}}{2}-\frac{1}{2}\right)\right)}{4}+\frac{1}{2}$
$\mathbf{\frac{1}{19^S}}$	$0=\frac{-\frac{1}{19^S}}{i-1}-\frac{\frac{1}{19^S}*i}{2}-\frac{4*\left(\left(\frac{\frac{1}{19^S}}{2}-\frac{1}{2}\right)\right)}{4}-\frac{1}{2}$	$\frac{1}{19^S}=\frac{-\frac{1}{19^S}}{i-1}-\frac{\frac{1}{19^S}*i}{2}+\frac{4*\left(\left(\frac{\frac{1}{19^S}}{2}-\frac{1}{2}\right)\right)}{4}+\frac{1}{2}$
...		

Therefore, any Natural number can be written as [complex number + 0.5]

$$A=\frac{-A}{i-1}-\frac{A*i}{2}+\frac{4*\left(\frac{A}{2}-\frac{1}{2}\right)}{4}+\frac{1}{2}$$

consider adding these four series ($EQ(1.5_2)$, $EQ(1.5_3)$, $EQ(1.5_9)$, $EQ(1.5_{10})$) together.

$$\frac{4*(\frac{1^S}{2}-\frac{1}{2})}{4}+\frac{4*(\frac{\frac{1}{2^S}}{2}-\frac{1}{2})}{4}+\frac{4*(\frac{\frac{1}{3^S}}{2}-\frac{1}{2})}{4}+\frac{4*(\frac{\frac{1}{4^S}}{2}-\frac{1}{2})}{4}+\frac{4*(\frac{\frac{1}{5^S}}{2}-\frac{1}{2})}{4}+\cdots$$

$$=\frac{2}{4}*\left(0+\left(\frac{1}{2^S}-1\right)+\left(\frac{1}{3^S}-1\right)+\left(\frac{1}{4^S}-1\right)+\left(\frac{1}{5^S}-1\right)+\left(\frac{1}{6^S}-1\right)+\cdots\right)$$

$$=\frac{1}{2}*(\zeta(S)-\zeta(0)-1)\ \boldsymbol{\rightarrow} EQ(1.5_9)$$

$$\left(\frac{1}{2}\right)*\ \zeta(0)=\left(\frac{1}{2}\right)*(1+1+1+1+1+1+1+1+1+\cdots)\boldsymbol{\rightarrow} EQ(1.5_{10})$$

$$\frac{1}{i-1}*\zeta(S)=\left(\frac{1}{i-1}+\frac{\frac{1}{2^S}}{i-1}+\frac{\frac{1}{3^S}}{i-1}+\frac{\frac{1}{4^S}}{i-1}+\frac{\frac{1}{5^S}}{i-1}+\frac{\frac{1}{6^S}}{i-1}+\frac{\frac{1}{7^S}}{i-1}+\cdots\right)\boldsymbol{\rightarrow} EQ(1.5_2)$$

$$\frac{i}{2}*\zeta(S)=(\frac{i}{2}+\frac{\frac{1}{2^S}*i}{2}+\frac{\frac{1}{3^S}*i}{2}+\frac{\frac{1}{4^S}*i}{2}+\frac{\frac{1}{5^S}*i}{2}+\frac{\frac{1}{6^S}*\ i}{2}+\frac{\frac{1}{7^S}*\ i}{2}+\frac{\frac{1}{8^S}*i}{2}+\cdots)\boldsymbol{\rightarrow} EQ(1.5_3)$$

if we added all these 4 equations and the Sum is equal to Zero then we proofed the third point in our proof methodology

$$-EQ(1.5_2)-\ EQ(1.5_3)+EQ(1.5_9)+EQ(1.5_{10})=\zeta(S)$$

$$if\ each\ term\ in\ summing\ these\ 4\ series=A\ then\ SUMof\ all\ terms\ =\ \zeta(S)$$

$$\begin{aligned}RHS=\ \zeta(S)=\ &\left(\left(\frac{-1}{i-1}-\frac{i}{2}+\frac{0}{4}+\frac{1}{2}\right)+\left(\frac{-\frac{1}{2^S}}{i-1}-\frac{\frac{1}{2^S}\ i}{2}+\frac{2*\frac{1}{2^S}-2}{4}+\frac{1}{2}\right)\right.\\&+\left(\frac{-\frac{1}{3^S}}{i-1}-\frac{\frac{1}{3^S}i}{2}+\frac{2*\frac{1}{3^S}-2}{4}+\frac{1}{2}\right)+\left(\frac{-\frac{1}{4^S}}{i-1}-\frac{\frac{1}{4^S}i}{2}+\frac{2*\frac{1}{4^S}-2}{4}+\frac{1}{2}\right)\\&+\left(\frac{-\frac{1}{5^S}}{i-1}-\frac{\frac{1}{5^S}i}{2}+\frac{2*\frac{1}{5^S}-2}{4}+\frac{1}{2}\right)+\left(\frac{\frac{-1}{6^S}}{i-1}-\frac{\frac{1}{6^S}\ i}{2}+\frac{2*\frac{1}{6^S}-2}{4}+\frac{1}{2}\right)\\&\left.+\left(\frac{-\frac{1}{7^S}}{i-1}-\frac{\frac{1}{7^S}\ i}{2}+\frac{2*\frac{1}{7^S}-2}{4}+\frac{1}{2}\right)+\left(\frac{-\frac{1}{8^S}}{i-1}-\frac{\frac{1}{8^S}\ i}{2}+\frac{2*\frac{1}{8^S}}{4}+\frac{1}{2}\right)+\cdots\right)\end{aligned}$$

$$LHS=\frac{-1}{i-1}*\zeta(S)-\frac{i}{2}*\zeta(S)+\frac{1}{2}*(\zeta(S)-\zeta(0)-1)+\ \left(\frac{1}{2}\right)*\ \zeta(0)=\zeta(S)$$

$$\frac{-1}{i-1}*\zeta(S)-\frac{i}{2}*\zeta(S)+\frac{1}{2}*(\zeta(S)-\zeta(0)-1)+\ \left(\frac{1}{2}\right)*\ \zeta(0)=\zeta(S)$$

$$\left(\frac{-1}{i-1}-\frac{i}{2}\right)*\zeta(S)+\frac{1}{2}*\zeta(S)-\frac{1}{2}=\zeta(S)$$

$$\zeta(S) = \left(\zeta(S) - \frac{1}{2}\right) \rightarrow EQ(3)$$

And a Zeta function have one pole at [1] then $\zeta(S)$ *have the same pole but (-0.5) i.e., at strip line.* By this we proofed all three parts of our proof methodology

$$and\ this\ proof\ \text{Riemann hypothesis}\ \ for\ any\ S$$

3. Results

1- *We showed that each Natural Number can be re written as a complex number (a + b i) such that (a = 0.5) And we summed all the terms from 1 up until ∞ and the sum is zero then.*
We proofed that if we re written all the terms into this form (0.5 + b i) we get all the Zeros including the none-trivial Zeros.

$$\frac{A}{i-1} + \frac{A*i}{2} + \frac{A}{2} = 0\ ; such\ that\ A\ any\ real\ number$$

2- *We showed that Any Natural number can be written as a complex number (a + b i) such that (a =0.5), the sum will be Zero.*

$$A = \frac{-A}{i-1} - \frac{A*i}{2} + \frac{\left(4*\left(\frac{A}{2}-\frac{1}{2}\right)\right)}{4} + \frac{1}{2}\ ; such\ that\ A\ is\ any\ real\ numebr$$

3- *we were able to proof that the Sum of Zeta function = Zeta Sum – 0.5; then we proofed that all non-trivial Zeros will be critical line at 0.5.*

$$If\ \zeta(S) = 0\ and\ \zeta(S)\ have\ one\ pole\ at\ 1; \quad \zeta(S) = \left(\zeta(S) - \frac{1}{2}\right)$$

Then all Zeros are at Critical line
We proofed all these three points in three cases.

$$\boldsymbol{Case\ (1):\ \zeta(-1)}$$
$$\boldsymbol{Case\ (2):\ \zeta(1)}$$
$$\boldsymbol{Case\ (3):\ \zeta(S)}$$

References

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