An efficient method to prove that the Riemann hypothesis is not valid

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Abstract

Analytical number theory is a combination of trigonometric functions and polynomial symbols, which can be solved no matter how difficult it is. Therefore, I believe that the Riemann hypothesis is not unsolvable. In the field of number theory, the mathematical community tends to seek a maximum number to overturn the conclusion. Whether it is the Riemann hypothesis ~~or~~ the Goldbach conjecture, this should be the solution.

This paper uses a counterexample to prove that the Riemann hypothesis does not hold. Of course, this counterexample is not the most important content, the process of obtaining this counterexample is the most important.

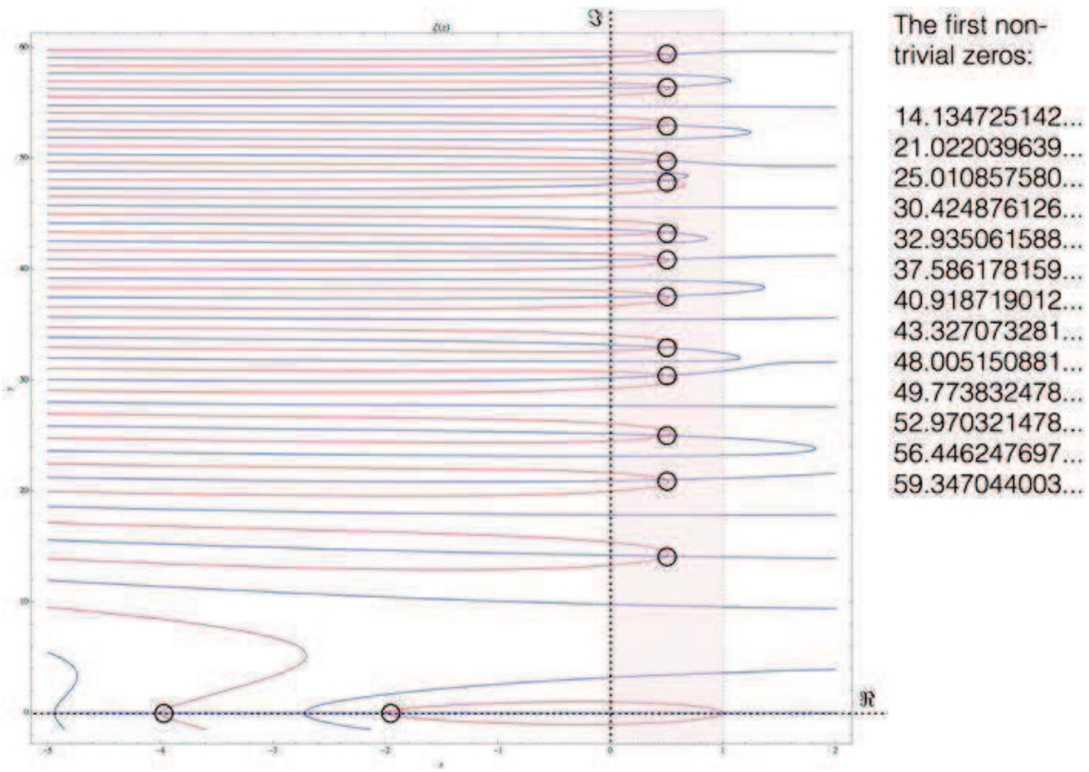
For Riemann functions ζ ， the continuity and analyticity will not be discussed in this paper, and the results will be used directly.

The most fundamental task in solving the problem of non trivial zeros in the Riemann hypothesis is computation. Make Re（ζ ）= 0, and Im（ζ ）= 0, we can Find the intersection point can yield the zero point.

Thanks to the formula given by Riemann (as follows), we can determine whether a point is on the critical line.

$$\zeta(s) = 2^s \pi^{s-1} \sin \frac{\pi s}{2} \Gamma(1-s) \zeta(1-s)$$

The inference is that non trivial zeros are related to Re (s)= ½ Symmetry, if there is only one intersection point, then Re (s) is considered= ½

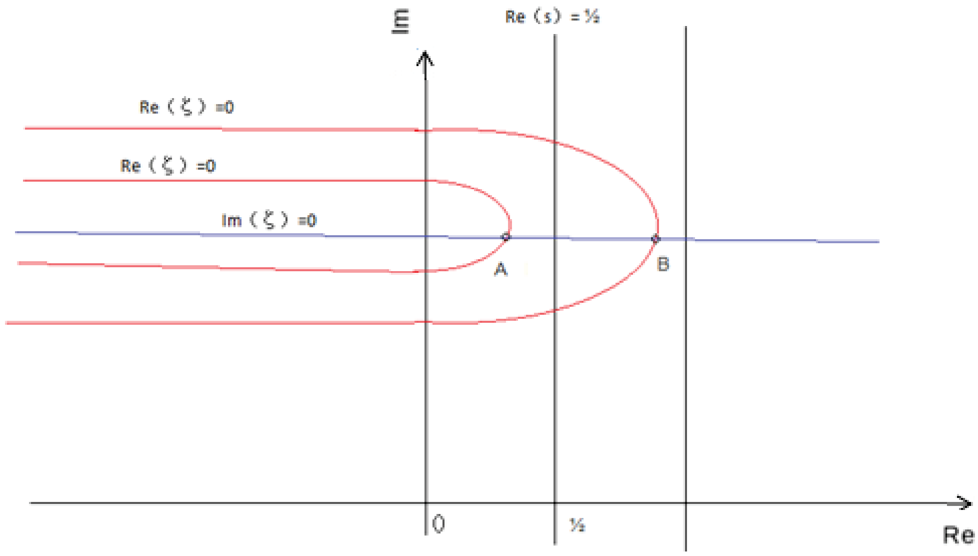


(Figure 1)

The red line represents Re（ ζ ）= 0, blue line represents Im（ ζ ）= 0

As can be seen, although there are many intersections, we cannot make a non trivial zeros of Re (s) ≠½

Therefore, we can only construct the following graph to make a non trivial zeros of Re (s) ≠½

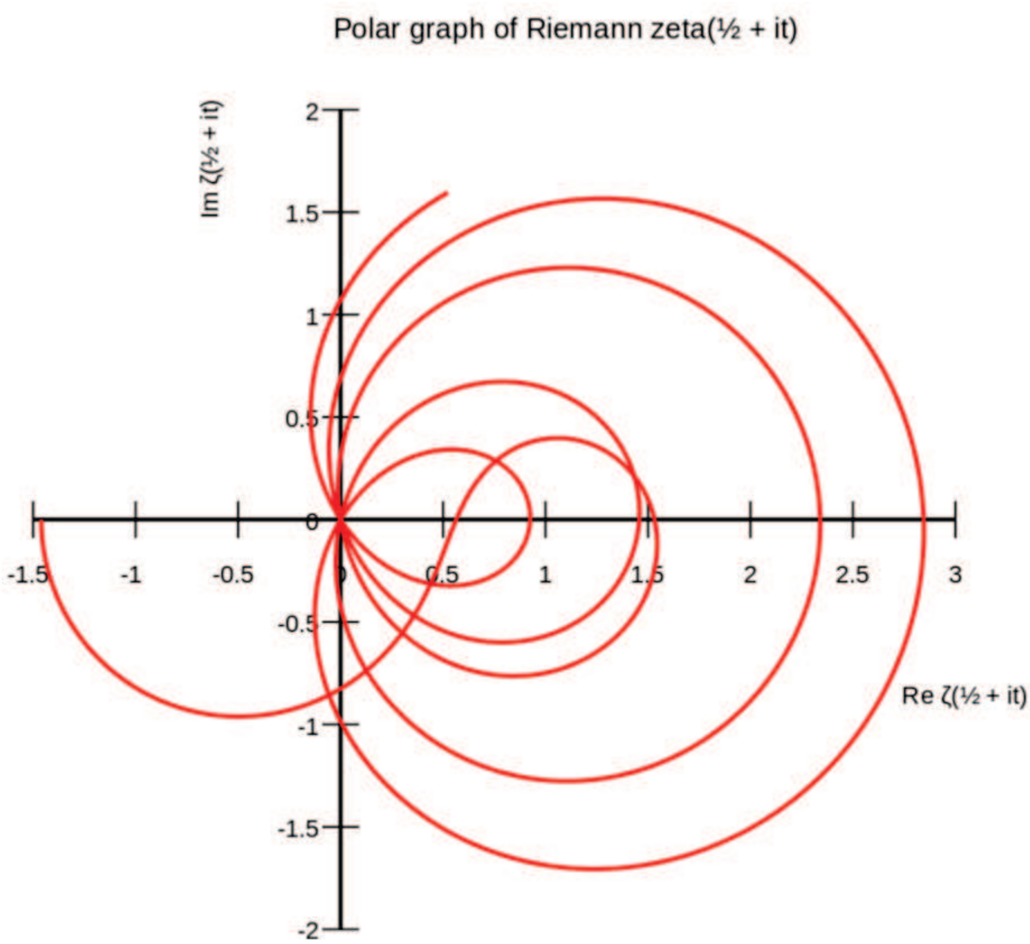


(Figure 2)

Let two non trivial zeros be A and B respectively, and the intersection point of line AB and the critical line be C. We have a conclusion that A and B are symmetric about the critical line.

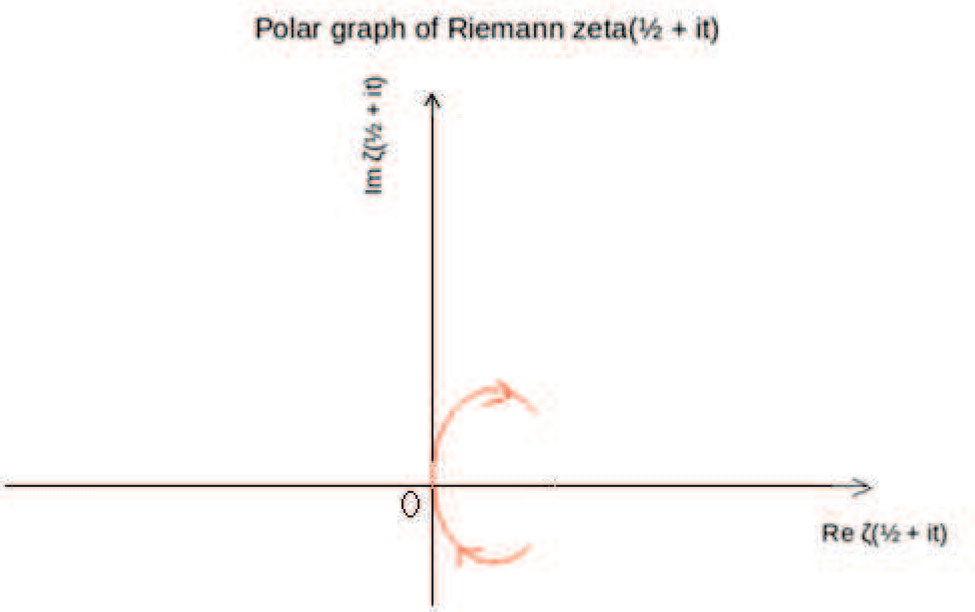
The focus of this paper is to discuss whether such non trivial zeros exist. If it exists, what are its properties. How to find this kind of point.

For Figure 1, we start from the real number axis and follow Re (s)= ½， Moving towards positive infinity yields



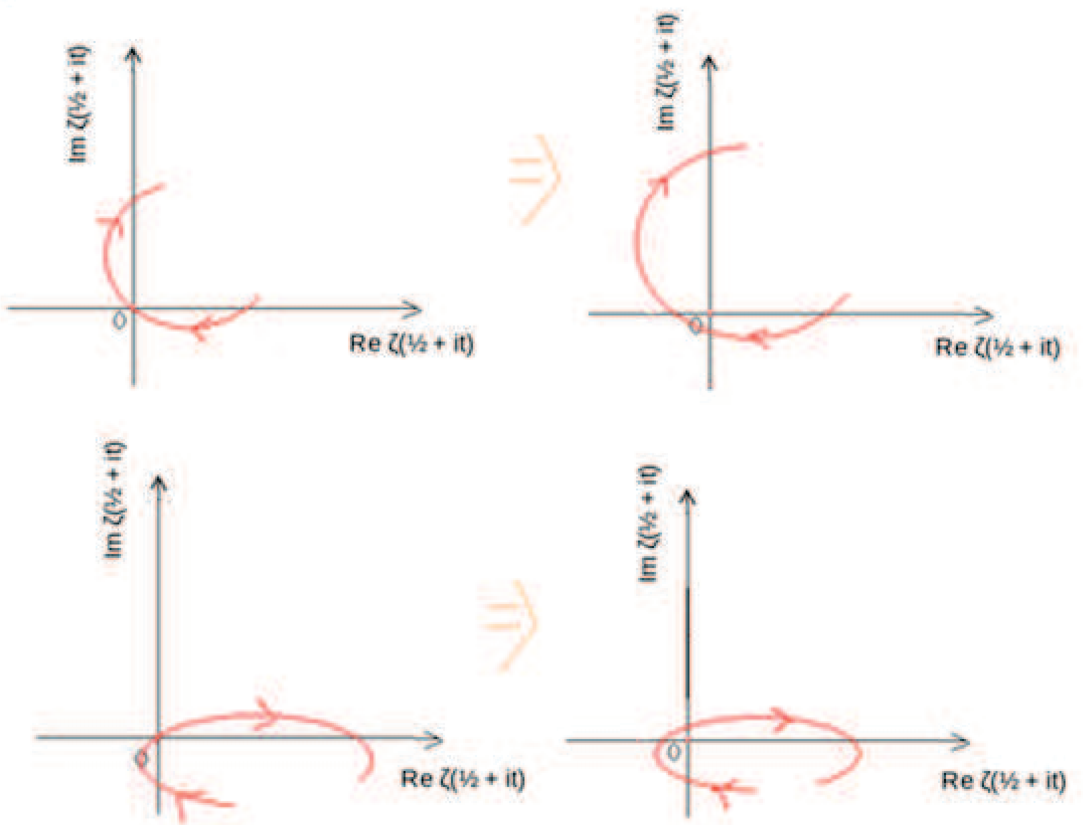
(Figure 3)

When a zero point occurs, it will pass through the origin of the coordinate axis. If in Figure 2, A and B coincide and are located at Re (s)= ½.So in Figure 3, a tangent line will appear, with the tangent point located at the center of the circle.



(Figure 4)

If in Figure 2, A and B do not coincide. So the curve no longer passes through the origin, but instead generates a displacement. Figure 3 will become



(Figure 5)

It is obvious that the occurrence of Re (s) ≠½ after the non trivial zero point, there will be a noticeable reaction on the coordinate axis.

So, how can we change the direction of rotation?

As shown in Figure 1, the red line represents Re（ζ ）= 0, blue line represents Im（ζ ）= 0, in Re (s)= ½, the red and blue lines alternate and continue to rotate clockwise. If a red or blue line is inserted, the rotation direction will be reversed. This is easy to prove and is one of the most important foundations of this article, which we have designated as argument one. (Argument 1)

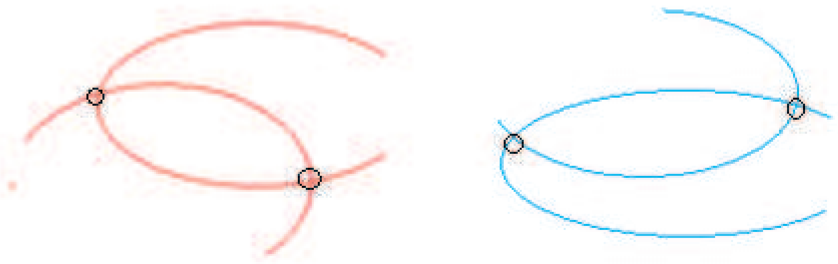
For the occurrence of non trivial zeros in Re (s) ≠½， There are several possibilities

1. A blue line intersects a red line with two intersection points

2. A blue line intersects two red lines, and the two intersection points are about Re (s)= ½ Symmetry. Or a red line intersects with two blue lines, and the two intersection points are about Re (s)= ½ symmetry

3. A blue line intersects a red line, with an intersection point. There is an intersection point between another blue line and another red line. Two intersection points about Re (s)= ½ Symmetry.

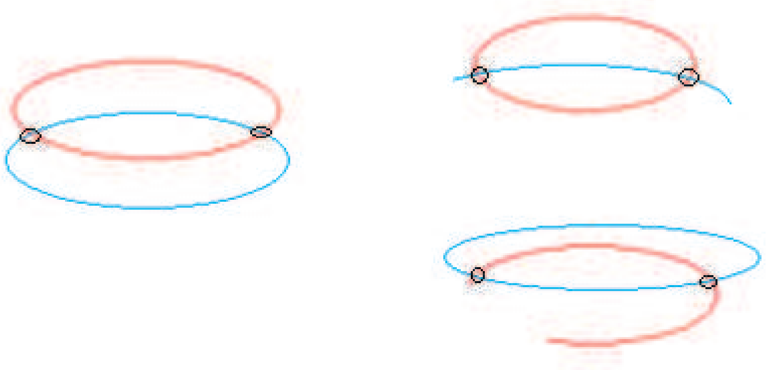
Firstly, we need to rule out one of the following situations.



(Figure 6)

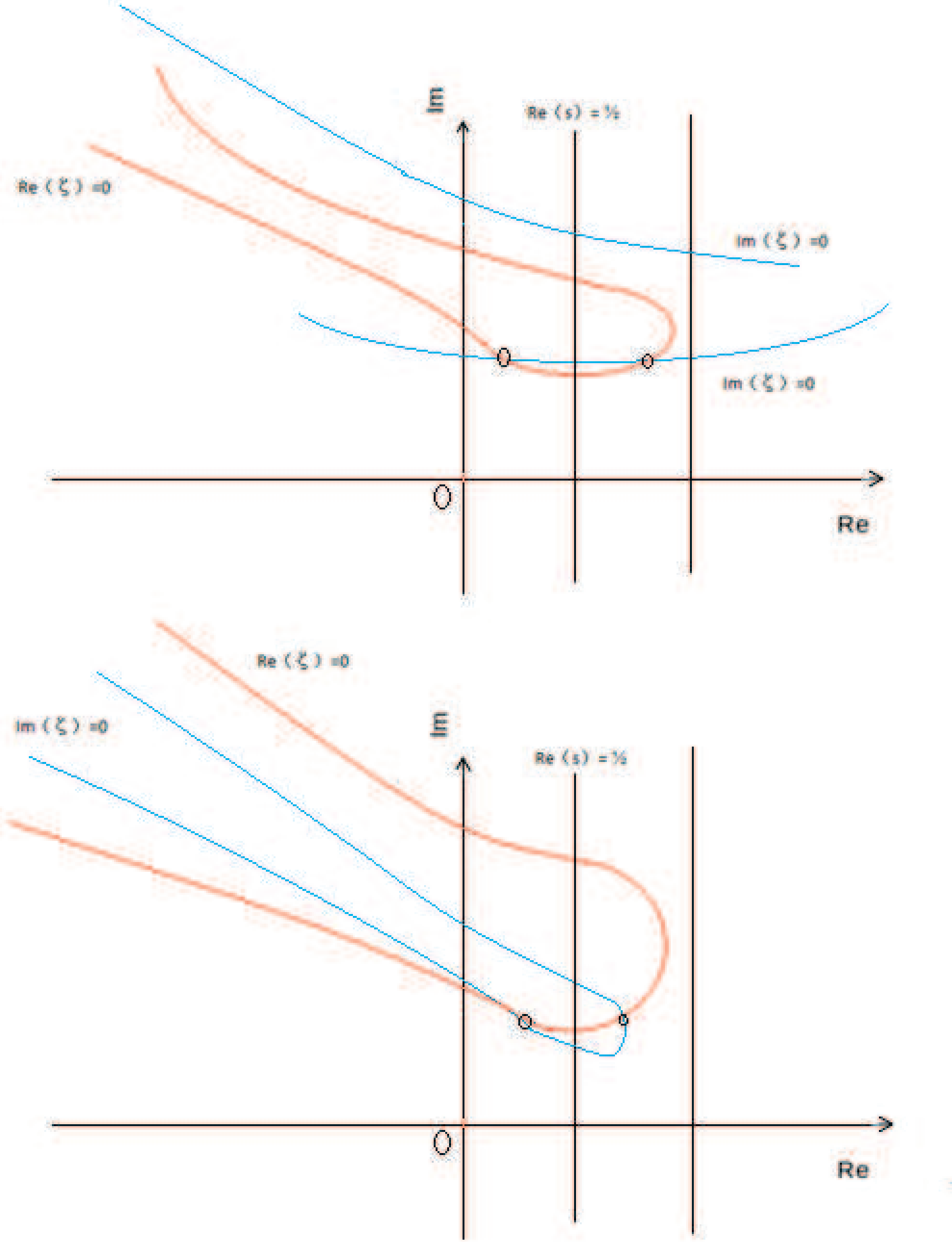
The two curves of Re（ζ ）= 0 cannot intersect,and The two curves of Im（ζ ）= 0 cannot intersect either. (Argument 2)

Secondly, apart from the real number axis, Re（ζ ）= 0 and Im（ζ ）= 0 cannot form a closed curve. (Argument 3)



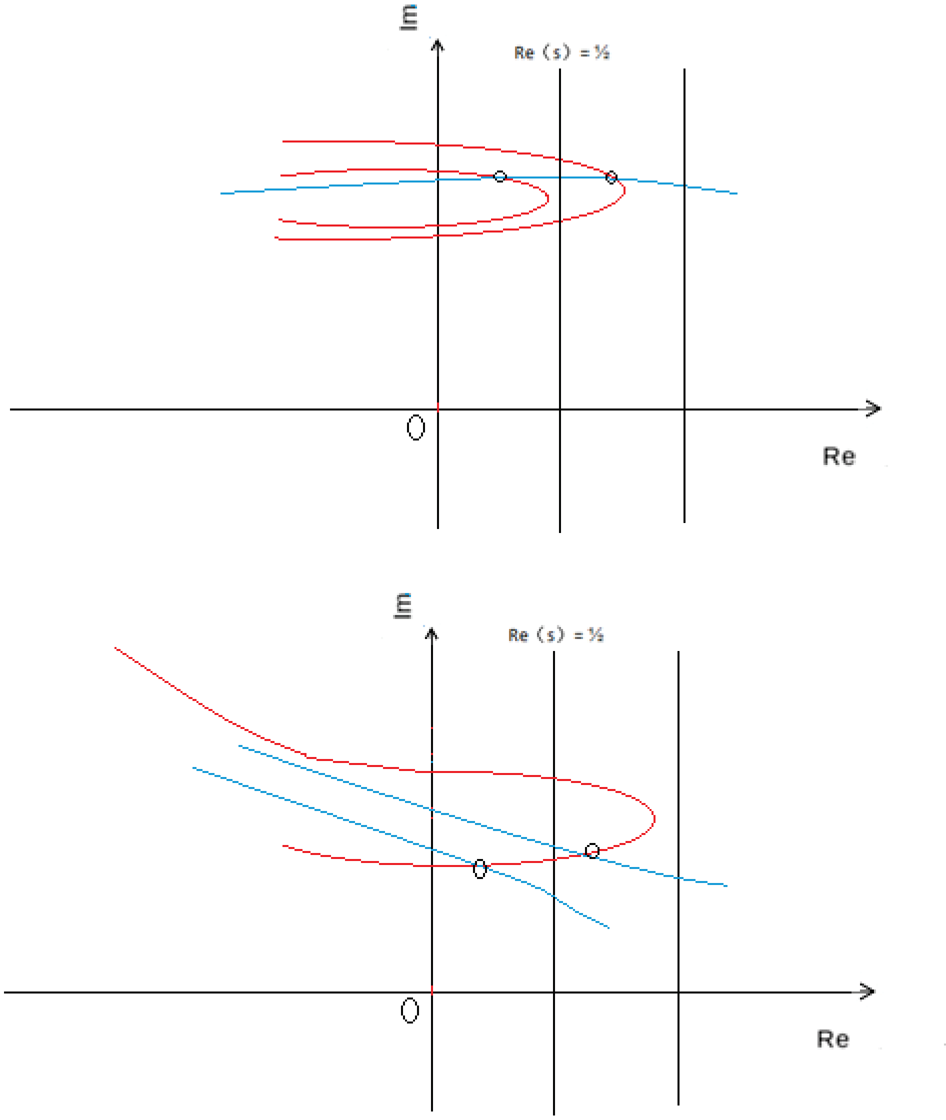
(Figure 7)

So for a blue line intersecting a red line with two intersection points, we can create the following two images



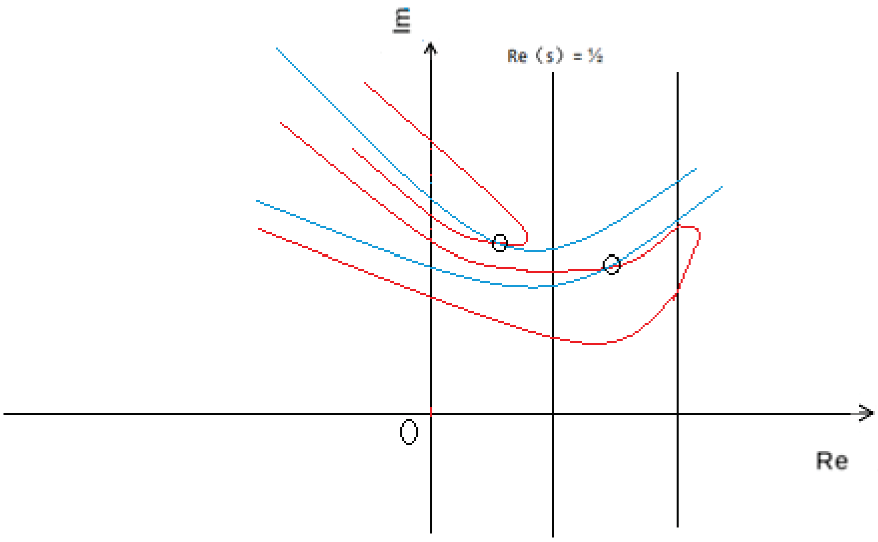
(Figure 8)

A blue line intersects two red lines, and the two intersection points are about Re (s)= ½ Symmetry. Or a red line intersects with two blue lines, and the two intersection points are about Re (s)= ½ symmetry



(Figure 9)

A blue line intersects a red line, with an intersection point. There is an intersection point between another blue line and another red line. Two intersection points about Re (s)= ½ Symmetry.

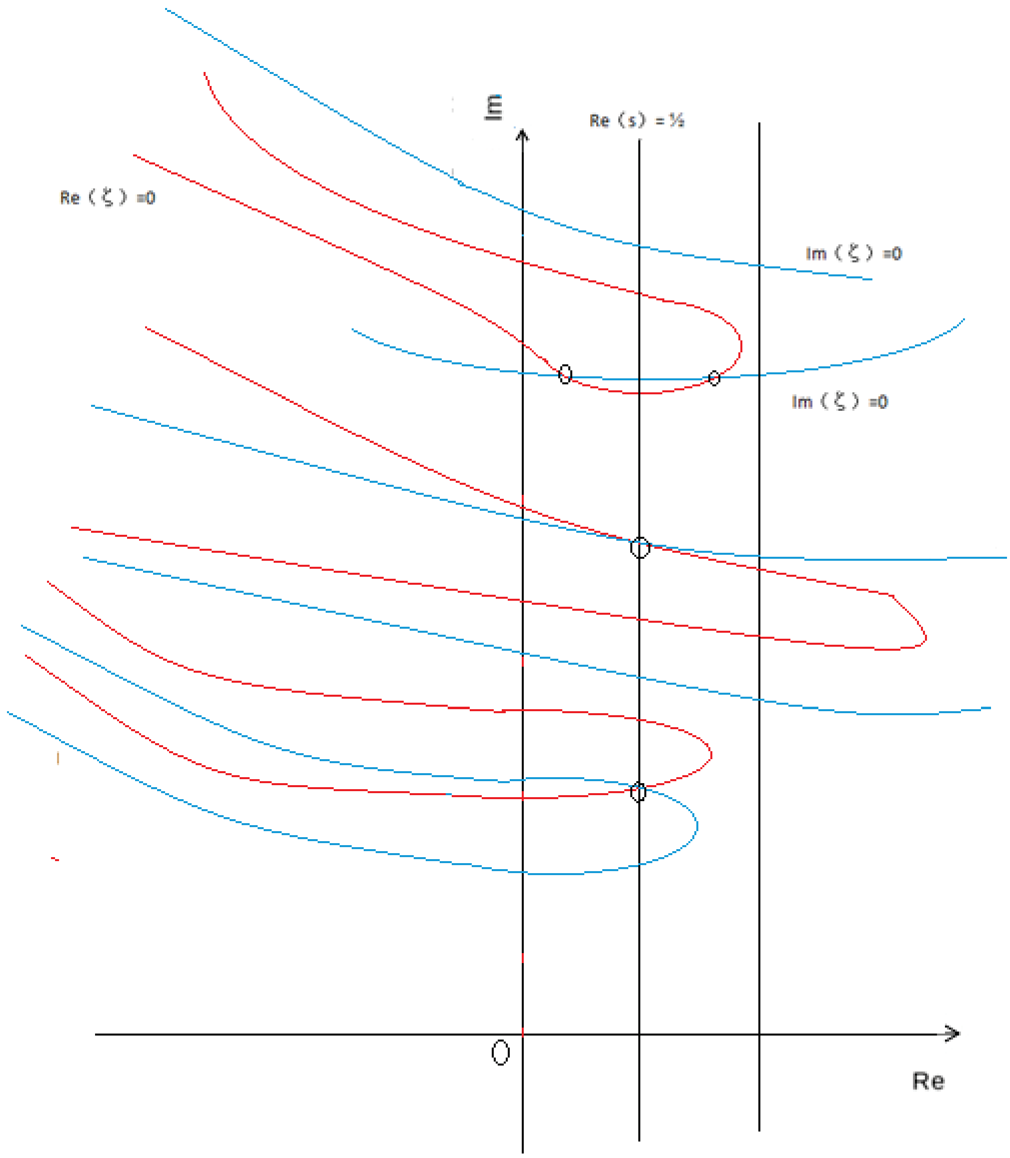


(Figure 10)

We cannot determine the exact situation of a symmetric zero point.

For this, I have to rely on Riemann ζ Add a strong constraint to the characteristics of the function. Any Re（ζ ）= 0 and Im（ζ ）= 0 can only have one intersection point located at Re (s)= ½， Or there may be two intersection points about Re (s)= ½ Symmetry. (Argument 4)

Argument 4 is a very strong viewpoint that I believe is correct, but it cannot be proven. Fortunately, this paper proves that the Riemann conjecture does not hold, and we can construct a counterexample through argument 4.



(Figure 11)

If there are Non trivial zeros of Re (s) ≠½, then in Figure 1, the alternating appearance of the blue and red lines changes. A blue or red line will be inserted, causing the curve in Figure 3 to reverse.

Therefore, the most important conclusion I propose is that if there exists Non trivial zeros of Re (s) ≠½, starting from the real number axis, along Re (s)= ½， Moving towards positive infinity, the rotation direction of the Im-Re curve at that non trivial zero point will change from clockwise to counterclockwise, or from counterclockwise to clockwise. (Argument 5)

There are countless non trivial zero point of Re (s) ≠½ ,and it can undergo countless reversals. (Argument 6)

Although mathematicians have calculated a large number of non trivial zeros at present, the efficiency is too low. If argument 5 holds, then we no longer need to calculate one zero point at a time, but can jump to a very large number to start calculating. If there is a reversal situation, it is determined that there is Re (s) $\neq$ ½ Find the value of the non trivial zero point by moving it.

In Re (s)= ½ Take any two points on a straight line that can have a significant difference in value, and solve for the rotation direction of the Im Re curve if there are different directions. So we can take two more points in the interval between these two points until we find the counterexample of the Riemann conjecture.
Of course, I need to provide a solution to the Riemann hypothesis. Firstly, I believe that the distribution of prime numbers is irregular, which inevitably leads to a very large number that makes the Riemann hypothesis untenable. What we need to do is to accelerate the efficiency of finding this number. This number should have a characteristic that distinguishes it from countless points that conform to the Riemann hypothesis.

Riemann ζ Functions are very complex in numerical calculations, but they are not inherently difficult. We can use the following example to illustrate this clearly.

$$f(x) = \sum_{r=1}^{\infty} \left(\sin \frac{\pi x}{r}\right) = 0$$

There exists a solution

X=0

Meanwhile, we also know that there is a solution to infinity

$$x = 1x2x3x4x\ldots n$$

Of course, neither of these solutions has much meaning. To find the remaining solutions, Taylor expansion is required, and the answer is obtained through approximate calculation.

I think Riemann ζ The function not only has non trivial zeros, but also an infinite number that is also zero, but no one has studied it.

For series, we know that there are three forms-

$$\sum_{r=1}^{\infty} \frac{1}{2^r}$$

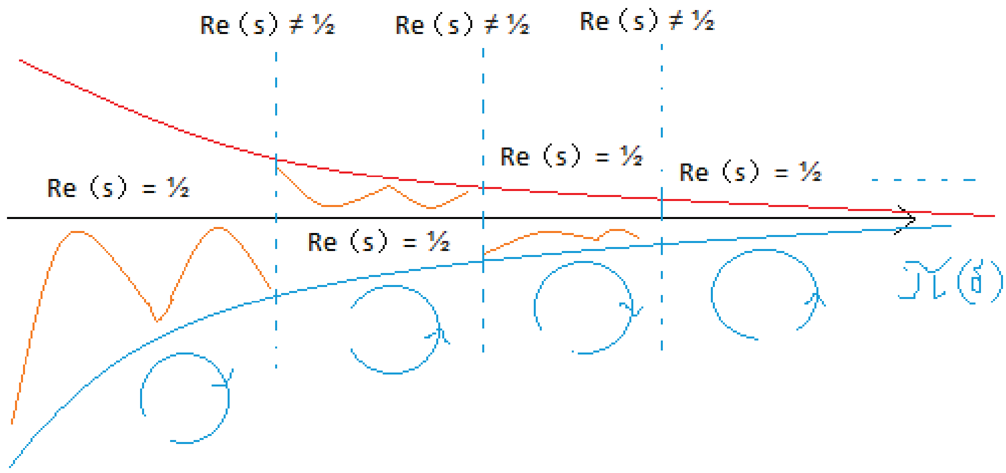
As r increases infinitely, the series continues to increase until the result reaches the limit of 1

$$f(x) = \sum_{r=1}^{\infty} \frac{1}{(-2)^r}$$

As r continues to increase, the situation where the series is larger than the limit and smaller than the limit alternately occurs

$$\zeta(s) = \frac{\Gamma(1-s)}{2\pi i} \int_C \frac{(-z)^s}{e^z - 1} \frac{dz}{z}$$

For Riemann ζ Functions have a great use in calculating the distribution of prime numbers, and mathematicians generally believe that non trivial zeros are located at Re (s)= ½.I think after a large number, there will be Non trivial zeros of Re (s) ≠½



(Figure 12)

The non trivial zeros of Re (s) ≠½ are due to a significant mutation in the distribution of prime numbers, which is the essence of nature and has no regularity. Therefore, it is impossible to construct complex operations through analytic number theory, and even if the calculation is done, the data will be gathered after knowing the answer. Although I am also putting a lot of effort into calculating Re (s) $\neq$½ Non trivial zeros, but no significant effects have been seen in the short term. At least through the rotation direction of the image, Non trivial zeros of Re (s) $\neq$½ can be quickly solved.

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