

The Riemann hypothesis has no counterexamples when imaginary part
below one million billion

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abstract

This article aims to identify counterexamples of the Riemann hypothesis. Although no upper bound was found for the counterexample, at least it was proven that there were no counterexamples when imaginary part below one million billion, significantly increasing the lower bound of the counterexample.

According to

$$\zeta(a+ib) = \left[\vec{V}_1 \cdot \cos(\theta_1) + \vec{V}_2 \cdot \cos(\theta_2) + \vec{V}_3 \cdot \cos(\theta_3) + \dots \right] + i \cdot \left[\vec{V}_1 \cdot \sin(\theta_1) + \vec{V}_2 \cdot \sin(\theta_2) + \vec{V}_3 \cdot \sin(\theta_3) + \dots \right]$$

We take a=0.5 and take the first 11 items to obtain

$$x = \frac{\cos(-t \ln 1)}{1} + \frac{\cos(-t \ln 2)}{1.41421356237} + \frac{\cos(-t \ln 3)}{1.73205080757} +$$

$$\frac{\cos(-t \ln 4)}{2} + \frac{\cos(-t \ln 5)}{2.2360679775} + \frac{\cos(-t \ln 6)}{2.44948974278} +$$

$$\frac{\cos(-t \ln 7)}{2.64575131106} + \frac{\cos(-t \ln 8)}{2.2843712475} + \frac{\cos(-t \ln 9)}{3} +$$

$$\frac{\cos(-t \ln 10)}{3.16227766017} + \frac{\cos(-t \ln 11)}{3.31662479036}$$

$$y = \frac{\sin(-t \ln 1)}{1} + \frac{\sin(-t \ln 2)}{1.41421356237} + \frac{\sin(-t \ln 3)}{1.73205080757} +$$

$$\frac{\sin(-t \ln 4)}{2} + \frac{\sin(-t \ln 5)}{2.2360679775} + \frac{\sin(-t \ln 6)}{2.44948974278} +$$

$$\frac{\sin(-t \ln 7)}{2.64575131106} + \frac{\sin(-t \ln 8)}{2.2843712475} + \frac{\sin(-t \ln 9)}{3} +$$

$$\frac{\sin(-t \ln 10)}{3.16227766017} + \frac{\sin(-t \ln 11)}{3.31662479036}$$

Using an intermediate variable t , when $y(t)=0$ and $x(t)=0$, finding the intersection point can yield the zero point

Due to the difficulty in finding a counterexample, we mainly focus on the y - x coordinate axis, with respect to the rotation direction of t .

Take $t=10^{11}, 10^{12}, 10^{13}, 10^{14}, 10^{15}$ respectively

The y - x coordinate axis rotates clockwise without any reverse rotation.

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video

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References

1. [viXra:2005.0284](#) The Riemann Hypothesis Proof **Authors:** [Isaac Mor](#)
2. [viXra:2401.0064](#) An Efficient Method to Prove that the Riemann Hypothesis Is Not Valid **Authors:** [Zhiyang Zhang](#)