The Riemann Hypothesis is false

By Viola Maria Grazia

Abstract: in this page I talk about convergence of zeta function.

The Riemann Hypothesis said that the zeta-function have all no trivial zeros on critical line that is the complex line 1/2+iy for all real y. But we proved the following theorem:

Theorem. Let the function \( \zeta(s) \) defined by \( \zeta(s) = \sum_{n=1}^{+\infty} \frac{1}{n^s} \), it converges for all \( s \) positive real number.

Proof. Let \( \frac{1}{m} : R^+ \to R^+ \) with \( 0 \leq m \) fixed, we prove:

Lemma. \( \lim_{x \to +\infty} \frac{1}{x^m} = a \) with \( 0 \leq m \) fixed and a real numbers

Proof. We suppose \( \lim_{x \to +\infty} \frac{1}{x^m} = +\infty \) that is

for all \( M > 0 \) exist \( S > 0 \) such that for \( x \geq S \Rightarrow \frac{1}{x^m} > M \)

for \( x \geq S > 0 \) we have \( \frac{1}{x^m} > 0 \) we obtain \( \frac{1}{x^m} > M \Rightarrow \frac{M}{x^m} < 1 \) so

for \( M > 0 \) and \( x \geq S > 0 \) \( \frac{M}{x^m} \to 0 < 1 \) ok

for \( M \to +\infty \) and \( x \geq S > 0 \) real \( \frac{M}{x^m} \to +\infty < 1 \) & for \( M \to +\infty \) \( x \to +\infty \) \( \frac{M}{x^m} \) (for \( M = \frac{1}{M_1} \), \( x = \frac{1}{x_1} \))

for \( M_1 \to +\infty \) \( x_1 \to +\infty \) \( \frac{1}{x^m} M_1 = (M_1 = dx_1 \text{ with } d > 0 ) = \frac{1}{x^m} \to +\infty \) absurd Q.E.D.

we have proved that \( \lim_{x \to +\infty} \frac{1}{x^m} = a \) with \( 0 \leq m \) and a real numbers

we have \( \frac{m}{l} a = \frac{m}{l} \lim_{x \to +\infty} \frac{1}{x^m} \) ( for Fundamental theorem of calculus) \( \geq \frac{m}{l} \lim_{x \to +\infty} \int_0^x \frac{1}{x^m} \) dt

For definition of Riemann integral \( \int_0^x \frac{1}{t^m} \) dt \( \geq \sum_{l=0}^{x-1} \min \frac{1}{t^m} \)

but \( \frac{1}{t^m} \) is a decreasing function so

\( \sum_{l=0}^{x-1} \min \frac{1}{t^m} = \sum_{l=1}^{x} \frac{1}{t^m} \)

So we have proved that for an \( d \) real \( d \geq \sum_{n=1}^{+\infty} \frac{1}{n^m} \) with \( 0 \leq m \) fixed Q.E.D.

We have proved that \( \zeta \)-function converges into complex half-plane of positive real numbers so it hasn’t zeros.