

Refutation of Riemann hypothesis by two zeta properties

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Abstract: Properties of the zeta function of the Riemann hypothesis are *not* confirmed as tautologous and hence refute it.

We assume the method and apparatus of Meth8/VL4 with Tautology as the designated *proof* value, **F** as contradiction, **N** as truthity (non-contingency), and **C** as falsity (contingency). Results are a 16-valued truth table in row-major and horizontal, or repeating fragments of 128-tables for more variables. (See ersatz-systems.com.)

LET $p, q, s: \zeta \text{ lc_zeta}, q, s;$
 \sim Not; $\&$ And; $+$ Or; $-$ Not Or; $>$ Imply; $=$ Equivalent; $@$ Not Equivalent;
 $\%$ possibility, for one or some; $\#$ necessity, for every or all;
 $(q@q)$ ordinal zero 0; $(\%q\>\#q)$ ordinal one 1.

From: Rigamonti, N. (2018). Two properties at the base of the Riemann hypothesis.
vixra.org/pdf/1812.0350v1.pdf nicolo.rigamonti1@gmail.com

$$\zeta(s)=\zeta(1-s) \tag{2.1}$$

$$(p\&s)=(p\&((\%q\>\#q)-s)); \quad \text{TNTN TNTN T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} \tag{2.2}$$

$$\zeta(\bar{s})=\overline{\zeta(s)} \tag{3.1}, (4.1)$$

$$(p\&\sim s)=\sim(p\&s); \quad \text{F\textbf{T}\textbf{F}\textbf{T} F\textbf{T}\textbf{F}\textbf{T} F\textbf{T}\textbf{F}\textbf{T} F\textbf{T}\textbf{F}\textbf{T} \tag{3.2}, (4.2)$$

Since $\zeta(s)=0, \overline{\zeta(s)}=0$ and so $\zeta(s)=\overline{\zeta(s)}$ (4A.2.1)

$$(((p\&s)=(q@q))>(\sim(p\&s)=(p@p)))>((p\&s)=\sim(p\&s)); \quad \text{T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} \tag{4A.2.2}$$

Since $\overline{\zeta(s)}=\zeta(\bar{s}), \zeta(s)=\overline{\zeta(\bar{s})}$ (4A.3.1)

$$(\sim(p\&s)=(p\&\sim s))>((p\&s)=(p\&\sim s)); \quad \text{T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} \tag{4A.3.2}$$

$$\zeta(s)=\zeta(\bar{s}) \tag{5.1}$$

$$(p\&s)=(p\&\sim s); \quad \text{T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} T\textbf{F}\textbf{T}\textbf{F} \tag{5.2}$$

$$\left. \begin{array}{l} \zeta(s)=\zeta(1-s) \\ \zeta(s)=\zeta(\bar{s}) \end{array} \right\} \begin{array}{l} \text{[Eq. 2.1]} \\ \text{[Eq. 5.1]} \end{array} \tag{6.1}$$

$$((p\&s)=(p\&((\%q\>\#q)-s)))=((p\&s)=(p\&\sim s)); \quad \text{T\textbf{C}\textbf{T}\textbf{C} T\textbf{C}\textbf{T}\textbf{C} T\textbf{T}\textbf{T}\textbf{T} T\textbf{T}\textbf{T}\textbf{T} \tag{6.2}$$

Remark 6.1: Eqs. 6.1 reduce to a more compact equivalence with the same truth table result in Eq. 6.2 as: $(p\&((\%q\>\#q)-s))=(p\&\sim s)$. (6.2.alt)

Eqs. 2-6 as rendered are *not* tautologous. This means properties of the zeta function of the Riemann hypothesis refute it.