Disproof of Riemann Hypothesis

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Abstract

In this short note, I am disproving the Riemann Hypothesis.

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There are opponents to Riemann Hypothesis, for example, the famous Dr. Littlewood. [3] In a 1947 lecture, the Danish mathematician Harald Bohr has said: "Nowadays, there are only three really great English mathematicians: Hardy and Littlewood". [4]

If Robin's inequality

$$F(n) < 1 \tag{1}$$

is true, where F is a certain function given in Ref. [1], Riemann's Hypothesis turns out to be true. And if there is at least one counter-example $n = n_c$ with $F(n_c) > 1$, then Riemann Hypothesis is false. Therefore, Robin's paper presents the equivalent formulation of the Riemann Hypothesis.

The problem begins, when the formula like $F(n) < 1 + B(n)$, [where $B(n) > 0$ is a certain function given in Ref. [2]] is also accepted as the equivalent formulation of Riemann's Hypothesis. Therefore, some n with

$$F(n) > 1 \tag{2}$$

are legitimate. But due to Eq.(1), they are wrong.

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[1] G. Robin, Grandes Valeurs de la fonction somme des diviseurs et hypothése de Riemann, J. Math. Pures Appl. **63**, 187–213 (1984); A. Akbary, Z. Friggstad, Superabundant numbers and the Riemann hypothesis, Am. Math. Monthly **116** (3), 273–275 (2009).

[2] J. C. Lagarias, An elementary problem equivalent to the Riemann hypothesis, The American Mathematical Monthly **109** (6), 534–543 (2002); C. E. Sandifer, How Euler Did It, MAA Spectrum, Mathematical Association of America, p. 206 (2007).

[3] J. E. Littlewood (1962), "The Riemann hypothesis", The scientist speculates: an anthology of partly baked idea, New York: Basic books; Aleksandar Ivić (2008), "On some reasons for doubting the Riemann hypothesis", in Borwein, Peter; Choi, Stephen; Rooney, Brendan; Weirathmueller, Andrea (eds.), The Riemann Hypothesis: A Resource for the Afficionado and Virtuoso Alike, CMS Books in Mathematics, New York: Springer, pp. 131–160, arXiv:math.NT/0311162.

[4] H. Bohr, "Looking Backward", Collected Mathematical Works. 1. Copenhagen: Dansk Matematisk Forening, xiii–xxxiv (1952).