Refutation of Riemann's hypothesis using the excluded middle

Abstract: The conjectured proof of the Riemann hypothesis using the excluded middle is refuted by the Meth8/VŁ4 modal logic model checker.

We assume the method and apparatus of Meth8/VŁ4 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, r, s: p, q, Riemann hypothesis (RH), s;
~ Not; > Imply; = Equivalent; @ Not Equivalent;
% possibility, for one or some; # necessity, for every or all;
(p=p) Tautology as designated *proof* value; (p@p) **F** as contradiction;
(%q>#q) N as truthity (non-contingency; (%s<#s) C as falsity (contingency).

From: Ireland, K.; Rosen, M. (1990). A classical introduction to modern number theory. 2nd ed. Springer. via en.wikipedia.org/wiki/Riemann_hypothesis

"Some consequences of the RH are also consequences of its negation, and are thus theorems. In their discussion of the Hecke, Deuring, Mordell, Heilbronn theorem, (Ireland & Rosen 1990, p. 359) say

The method of proof here is truly amazing. (1.0.0)
If the generalized Riemann hypothesis is true, then the theorem is true. (1.1.0)
If the generalized Riemann hypothesis is false, then the theorem is true. (1.2.0)
Thus, the theorem is true!! (punctuation in original)" (1.3.0)

We write Eqs. 1.0.1, 1.0.2, and 1.0.3 as:

If RH is equivalent to truthity, then RH is a tautology. (1.1.1)
(r=(%p>#p))>(r=(p=p)) ; NNNN TTTT NNNN TTTT (1.1.2)

If RH is equivalent to falsity, then RH is a tautology. (1.2.1)
(r=(%p<#p))>(r=(p=p)) ; CCCC TTTT CCCC TTTT (1.2.2)

RH is a tautology with Eq. 1.1.1 equivalent to Eq. 1.2.1. (1.3.1)
((r=(%p>#p))>(r=(p=p))) = ((r=(%p<#p))>(r=(p=p))) ;
FFFF TTTT **FFFF** TTTT (1.3.2)

Eq. 1.3.2 as rendered is *not* tautologous, meaning the conjectured proof of Eq. 1.0.3 is refuted.

Remark: Eqs. 1.1.1 and 1.2.1 can be written to avoid the distinction of truthity-falsity versus tautology-contradiction, that is to rely on the latter, with the same result of 1.3.2. (1.4.1)
((r=(p=p))>(r=(p=p))) = ((r=(p@p))>(r=(p=p))) ;
FFFF TTTT **FFFF** TTTT (1.4.2)