Refutation of Cantor's diagonal argument

From: en.wikipedia.org/wiki/Cantor%27s_diagonal_argument

"A generalized form of the diagonal argument was used by Cantor to prove Cantor's theorem: for every set *S*, the power set of *S*—that is, the set of all subsets of *S* (here written as ***P***(*S*))—has a larger cardinality than *S* itself. This proof proceeds as follows: Let *f* be any function from *S* to ***P***(*S*). It suffices to prove *f* cannot be surjective. That means that some member *T* of ***P***(*S*), i.e. some subset of *S*, is not in the image of *f*. As a candidate consider the set:

$T = \{ s \in S : s \notin f(s) \}$. [0.1]

For every *s* in *S*, either *s* is in *T* or not. If *s* is in *T*, then by definition of *T*, *s* is not in *f*(*s*), so *T* is not equal to *f*(*s*). [1.1]

On the other hand, if *s* is not in *T*, then by definition of *T*, *s* is in *f*(*s*), so again *T* is not equal to *f*(*s*) ..." [2.1]

We assume the apparatus of the Meth8 modal logic model checker implementing variant system VŁ4. Meth8 allows to mix four logical values with four analytical values. The designated *proo*f value is T.

Definition	Axiom	Symbol	Name	Meaning	2-tuple	Ordinal
1	p=p	T	Tautology	proof	11	3
2	p@p	F	Contradiction	absurdum	00	0
3	%p>#p	N	Non-contingency	truth	01	1
4	%p<#p	C	Contingency	falsity	10	2

LET: ~ Not; + Or; & And; \ Not and; > Imply; < Not imply, ∈; = Equivalent to; @ Not equivalent to; # all, every; % some, each; pqrs fTSs; *s*∉*f*(*s*) ~(*s*>*f*(*s*))

Results are the repeating proof table(s) of 16-values in row major horizontally.

q=((s<r)>~(s<(p&s))) ; `FFTT FFTT TFFT FFTT` (0.2)

(q=((s<r)>~(s<(p&s))))>(((#s<r)>((s<q)>~(s>(p&s))))>(q@(p&s))) ;
`TTTT TTTT FTTF TTTF` (1.2)

(q=((s<r)>~(s<(p&s))))>((~(#s<r)>((s<q)> (s>(p&s))))>(q@(p&s))) ;
`TTTT TTTT CTTF TTTF` (2.2)

Because Eqs. 1.2 and 2.2 result in the same consequent, they are rewritten to remove respective common terms and set as an equivalence according to Eqs. [1.1] and [2.1].

((#s<r)>((s<q)>~(s>(p&s)))) = (~(#s<r)>((s<q)> (s>(p&s)))) ;
`TTTT TTTT NCTT FTTT` (3.2)

Eqs. 1.2 and 2.2 as rendered are *not* tautologous. Hence Cantor's diagonal argument is not supported.