Refutation of Collatz conjecture

The Collatz conjecture is described at wikipedia.org/wiki/Collatz_conjecture, for which we decompose farther below:

> "[A] sequence defined as follows: start with any positive number *n*. Then each term is obtained from the previous term as follows: if the previous term is even, the next term is one half the previous term. If the previous term is odd, the next term is 3 times the previous term plus 1. The conjecture is that no matter what value of *n*, the sequence will always reach 1."

We assume the method and apparatus of Meth8/VŁ4 with `T`autology as the designated *proof* value, `F` as contradiction, `N` as truthity (non-contingency), and `C` as falsity (contingency). The 16-valued truth table is row-major and horizontal.

LET p, q, r, s: previous term (dividend), quotient, remainder, instant term;
+ Or, add; - Not Or, subtract; & And, multiply; \ Not And, divide;
> Imply, greater than; < Not Imply, lesser than; = Equivalent; @ Not Equivalent;
% possibility, possibly, for one or some; # necessity, necessarily, for all or every.
(%r>#r) ordinal one; (%r<#r) ordinal two; (r=r) ordinal three; (r@r) ordinal zero;

"[A] sequence defined as follows: start with any positive integer *n*.", that is, any previous term and instant term are both greater than zero. (0.0.1)

(%p&s)>(r@r) ; `TTTT TTTT NFNF NFNF` (0.0.2)

We define even number as:

If previous term and instant term are both greater than zero, then both (remainder is less than 1 and not(remainder is less than zero)) and both (previous term divided by one equals quotient plus remainder and remainder equals zero). (0.1.1)

((%p&s)>(r@r))>(((r<(%r>#r))&~(r<(r@r)))&(((p\(%r<#r))=(q+r))&(r=(r@r)))) ; `FFFF FFFF CTCT CTCT` (0.1.2)

Hence, odd number is not Eq. 0.0.1. (0.2.1)

~(((%p&s)>(r@r))>(((r<(%r>#r))&~(r<(r@r)))&(((p\(%r<#r))=(q+r))&(r=(r@r)))))=(r=r) ; `TTTT TTTT NFNF NFNF` (0.2.2)

We further decompose the description below.

"[I]f the previous term is even, the next term is one half the previous term. (1.1)

(p=(((%p&s)>(r@r))>(((r<(%r>#r))&~(r<(r@r)))&(((p\(%r<#r))=(q+r))&
(r=(r@r))))))>(s=(p\(%r<#r))) ; FTFT FTFT TNTN TNTN (1.2)

"If the previous term is odd, the next term is 3 times the previous term plus 1. (2.1)

(p=~(((%p&s)>(r@r))>(((r<(%r>#r))&~(r<(r@r)))&(((p\(%r<#r))=(q+r))&
(r=(r@r))))))>(s=((p&(r=r))+(%r>#r))) ; TFTF TFTF NTNT NTNT (2.2)

The conjecture is that no matter what value of *n*, the sequence will always reach 1."
We write this as: Eqs. 1.1 or 2.1 implies one. (3.1)

(((p=(((%p&s)>(r@r))>(((r<(%r>#r))&~(r<(r@r)))&(((p\(%r<#r))=(q+r))&
(r=(r@r))))))>(s=(p\(%r<#r))))
+
((p=~(((%p&s)>(r@r))>(((r<(%r>#r))&~(r<(r@r)))&(((p\(%r<#r))=(q+r))&
(r=(r@r))))))>(s=((p&(r=r))+(%r>#r)))))
>(%r>#r) ; NNNN NNNN NNNN NNNN (3.2)

Eq. 3.2 as rendered is *not* tautologous, refuting the Collatz conjecture. However, Eq. 3.2 does result in N non contingency as truthity.

Remark: We reiterate that with (p&s)>(r@r) the previous term or instant term are not equal to the placeholder of zero.