Refutation of the Löwenheim–Skolem theorem

We assume the apparatus and method of Meth8/VL4, with the designated *proo*f value of T. The 16-valued proof table is row-major and horizontal.

LET p, q, r, s: κ lc_kappa, M, N, σ lc_sigma;
~ Not; & And; + Or; > Imply, greater than; < Not Imply, less than;
= Equivalent; @ Not Equivalent; # necessity, for every; % possibility, for one;
(p@p) 0, zero; (s>(p@p)) |σ|; (q>(p@p)) |*M*|; (r>(p@p)) |*N*|; ~(p<q) (p≥q).

From: en.wikipedia.org/wiki/Löwenheim–Skolem_theorem

In its general form, the Löwenheim–Skolem theorem states that for every signature σ, every infinite σ-structure *M,* and every infinite cardinal number κ ≥ |σ|, (1.1)

#(s&((s&q)&(~(p<(s>(p@p)))))) ; FFFF FFFF FFNF FFNF (1.2)

there is a σ-structure *N* (2.1)

%(s&r) ; CCCC CCCC CCCC TTTT (2.2)

such that |*N*| = κ and
if κ < |*M*| then *N* is an elementary substructure of *M*; [and/or]
if κ > |*M*| then *N* is an elementary extension of *M*. (3.1)

(((r>(p@p))=p)&(((p<(q>(p@p)))>(q<r)) [&,+] ((p>(q>(p@p)))>(q>r)))) ;
FTFT TFTF FTFT TFTF (3.2)

Eqs. 1.1 implies 2.1. (4.1)
#(s&((s&q)&~(p<(s>(p@p)))))>%(s&r) ; TTTT TTTT TTCT TTTT (4.2)

Eqs. (1.1 implies 2.1) implies 3.2. (5.1)
(#(s&((s&q)&~(p<(s>(p@p)))))>%(s&r)) >
(((r>(p@p))=p)&(((p<(q>(p@p)))>(q<r))+((p>(q>(p@p)))>(q>r)))) ;
FTFT TFTF FTFT TFTF (5.2)

Eq. 1.2 as rendered is *not* tautologous, and not contradictory.

Eq. 4.1 is *not* tautologous due to one C falsity value.

Eq. 4.2 is *not* tautologous, and the same result table as Eq. 3.2.

This means the Löwenheim–Skolem theorem is refuted.