Refutation of the language of sets for model theory = universal algebra + mathematical logic

Abstract: A first order language of sets is proposed, but the first example *A*⊂*B* iff (*x*∈*A* then *x*∈*B*) is *not* tautologous. This refutes the conjecture of model theory = universal algebra + mathematical logic, which forms a *non* tautologous fragment of the universal logic VŁ4.

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). The 16-valued truth table is row-major and horizontal, or repeating fragments of 128-tables, sometimes with table counts, for more variables. (See ersatz-systems.com.)

LET ~ Not, ¬ ; + Or, ∨, ∪, ⊔ ; - Not Or; & And, ∧, ∩, ⊓ ,·; \ Not And;
> Imply, greater than, →, ⇒ , ↦, ≻, ⊃, ↠ ;
< Not Imply, less than, ∈, ≺, ⊂, ⊬, ⊭, ↞, ≲ ;
= Equivalent, ≡, :=, ⇐⇒, ↔, ≜, ≈, ≃ ; @ Not Equivalent, ≠;
% possibility, for one or some, ∃, ◊, M; # necessity, for every or all, ∀, □, L;
(z=z) T as tautology, ⊤, ordinal 3; (z@z) **F** as contradiction, Ø, Null, ⊥ , zero;
(%z>#z) N as non-contingency, Δ, ordinal 1;
(%z<#z) C as contingency, ∇, ordinal 2;
~(y < x) (x ≤ y), (x ⊆ y); (A=B) (A~B); (B>A) (A⊢B); (B>A) (A⊨B).
Note for clarity, we usually distribute quantifiers onto each designated variable.

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1.1. **What is Model Theory?** ... Model Theory introduces Mathematical Logic in the practice of Universal Algebra, so we can think it like Model Theory = Universal Algebra + Mathematical Logic. (1.1.1)

1.2. **Languages.** To start we fix a first order language L which contains exactly those symbols that we request in our interest and nothing else. … A simple example of a language is L_{sets} = {∈} the language of sets, note that we can define other symbols in Set Theory from ∈, for example *A* ⊂ *B* iff (*x* ∈ *A* then *x* ∈ *B*) (1.2.1.1)

LET p, q, r: A, B, x.

((r<p)>(r<q))>(p<q) ; **F**T**FF** **F**T**FF** **F**T**FF** **F**T**FF** (1.2.1.2)

Eq. 1.2.1.2 as rendered is *not* tautologous to refute the first order language of sets as proposed. What follows is that Eq. 1.1.1 model theory = universal algebra + mathematical logic is also refuted.