Set Theoretic Proof ~~X ≠ X

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Abstract

We prove that ~~X ≠ X where ~ = "not" in a logical/set-theoretic context (ALL mathematics and logic), X represents ANY logical statement equivalent to a set of associated facts (which many times is countably infinite or more), ~X, read "not X", represents the logical / set-theoretic complement of X, which is comprised of the complementary set of associated facts with respect to X. We give a proof by contradiction and the solitary exception to the rule regarding phi, the null/empty set.

~~X ≠ X
Proof:

An interesting set-definition of the number 1 follows. Let U be defined by {(0, 2)} which we know includes the point {1}. {1} is i.e., identically equal, to:
U - [set-One + set-Two] where
set-One i.e. {(0, 1)}
set-Two i.e. {(1, 2)}
and "+" and "-" are the standard set-theoretic usages NOT arithmetic usages. So set theoretically, {1} can be defined as above as the boundary between the two disjoint unit intervals in {(0, 2)}.

Now,
~One i.e. Two + {1}
~Two i.e. One + {1}
=>
~{Two, {1}} i.e. {One, {1}, ~{1}}
~{One, {1}} i.e. {Two, {1}, ~{1}}
=>
~{Two, {1}} i.e. {One, {1}, One, Two}
~{One, {1}} i.e. {Two, {1}, One, Two}
=>
~{Two, {1}} i.e. U
~{One, {1}} i.e. U
=>
~~One i.e. U ≠ One
~~Two i.e. U ≠ Two
=>
~~X ≠ X for ANY X Except phi, the null/empty set:
Corollary:
~~phi i.e. phi
Proof:
by standard definition, phi i.e. {•}, "the set with NO elements"; U i.e. phi^c, "the set of all sets" i.e. "the set with all elements". So, phi i.e. U^c, ~phi i.e. U, ~U i.e. phi, and finally ~~phi i.e. phi. But remember, this is the ONLY exception to the general logical rule:

"not not statement X is NOT equivalent
to statement X"
"~~X is equivalent to saying:
"all true statements are true"
which asserts NOTHING"
QED Corollary; QED main Proof