

## Meth8/VL4 self-proves in one variable for validity, consistency, completeness, and soundness

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We assume the method and apparatus of Meth8/VL4 with  $\tau$  as the designated *proof* value,  $F$  as contradiction,  $N$  as truthity (non-contingency), and  $C$  as falsity (contingency). Results are a 16-valued truth table in row-major and horizontal

LET:  $>$  Imply, greater than;  $<$  Not Imply, less than;  $=$  Equivalent;  $@$  Not Equivalent;  
 $\%$  possibility, for one or some;  $\#$  necessity, for every or all;  
 $(\%p>\#p)$  truthity;  $(\%p<\#p)$  falsity;  $(p=p)$  tautology;  $(p@p)$  contradiction.

We test Meth8/VL4 using itself in one variable for the four qualities of a perfect logic system:

1. Validity – Falsity (or contradiction) as consequent is not implied by truthity (or tautology) as antecedent. (1.0)

Truthity implying falsity is a falsity (1.1.1)

$(\%p>\#p)>(\%p<\#p))=(\%p<\#p)$  ; TTTT TTTT TTTT TTTT (1.1.2)

Tautology implying contradiction is a contradiction (1.2.1)

$((p=p)>(p@p))=(p@p)$  ; TTTT TTTT TTTT TTTT (1.2.2)

2. Consistency – Truthity (or tautology) conflicts with its opposite of falsity (or contradiction). (2.0)

Truthity is not equal to falsity (2.1.1)

$(\%p>\#p)@(\%p<\#p)$  ; TTTT TTTT TTTT TTTT (2.1.2)

Tautology is not equal to contradiction (2.2.1)

$(p=p)@(p@p)$  ; TTTT TTTT TTTT TTTT (2.2.2)

3. Completeness – Any truthity (or falsity) implies its tautology (or contradiction). (3.0)

Any truthity implies its tautology. (3.1.1)

$\#(\%p>\#p)>(p=p)$  ; TTTT TTTT TTTT TTTT (3.1.2)

Any falsity implies its contradiction. (3.2.1)

$\#(\%p<\#p)>(p@p)$  ; TTTT TTTT TTTT TTTT (3.2.2)

4. Soundness – Any tautology (or contradiction) implies its truthity (or falsity). (4.0)

Any tautology implies its truthity. (4.1.1)

$\#(p=p)>(\%p>\#p)$  ; TTTT TTTT TTTT TTTT (4.1.2)

Any contradiction implies its falsity. (4.2.1)

$\#(p@p)>(\%p<\#p)$  ; TTTT TTTT TTTT TTTT (4.2.2)

Eqs. 1, 2, 3, and 4 are tautologous. This means Meth8/VL4 proves itself, and in one variable.

**Remark:** This also serves as the contra-example to the incompleteness theorem of Gödel which states a logic system cannot prove itself (and certainly not in one variable).