

Student quiz denied as a paradox and refuted as a conjecture

© Copyright 2019 by Colin James III All rights reserved.

Abstract: We assume the teacher is veracious and evaluate the assertion “There is possibly a quiz next week on Monday, Tuesday, or Wednesday.” It is not tautologous, hence denying it is a paradox and refuting it as a conjecture. Therefore the student quiz paradox is a *non* tautologous fragment of the universal logic $\forall\mathcal{L}4$.

We assume the method and apparatus of Meth8/ $\forall\mathcal{L}4$ with \top tautology as the designated proof value, \mathbf{F} as contradiction, \mathbf{N} as truthity (non-contingency), and \mathbf{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 \sim Not, \neg ; $+$ Or, \vee , \cup , \sqcup ; $-$ Not Or; $\&$ And, \wedge , \cap , \sqcap , $;$; \backslash Not And;
 $>$ Imply, greater than, \rightarrow , \Rightarrow , \mapsto , \succ , \supset , \rightsquigarrow ;
 $<$ Not Imply, less than, \in , $<$, \subset , \prec , \preceq , \leq , \lesssim ;
 $=$ Equivalent, \equiv , $:=$, \Leftrightarrow , \leftrightarrow , \triangleq , \approx , \simeq ; $@$ Not Equivalent, \neq ;
 $\%$ possibility, for one or some, \exists , \diamond , \mathbf{M} ; $\#$ necessity, for every or all, \forall , \square , \mathbf{L} ;
 $(z=z)$ \top as tautology, \top , ordinal 3; $(z@z)$ \mathbf{F} as contradiction, \emptyset , Null, \perp , zero;
 $(\%z>\#z)$ \mathbf{N} as non-contingency, Δ , ordinal 1;
 $(\%z<\#z)$ \mathbf{C} as contingency, ∇ , ordinal 2;
 $\sim(y < x)$ ($x \leq y$), ($x \subseteq y$); $(A=B)$ ($A\sim B$); $(B>A)$ ($A\neq B$); $(B>A)$ ($A\neq B$).
 Note for clarity, we usually distribute quantifiers onto each designated variable.

The teacher asserts there is possibly a quiz next week on Monday, Tuesday, or Wednesday. (1.1)

Remark 1.1: We assume the teacher is veracious.

LET p, q, r, s : Monday, quiz, Tuesday, Wednesday.

$$\%(((q>((p+r)+s))+(\sim(q>p)>(q>(r+s))))+(\sim((q>p)\&(q>r))>(q>s)))=(p=p);$$

TTCT TTTT TTTT TTTT (1.2)

Should the student: Expect a quiz (and possibly on what day); Be surprised by a quiz; or Assume no quiz.

Because Eq. 1.2 is *not* tautologous, the student may safely choose indifference to the specter of a quiz. This means other solutions are not viable.