

FOL Deduction Question

Source: <http://coding.derkeiler.com/Archive/General/comp.theory/2004-12/0630.html>

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Hello,

Suddenly I found myself confused when thinking about FOL and Gentzen systems. I'd appreciate some help getting my thought back on track.

This sequent should be (easily) falsifiable, right?

|– Exists $x . P(x)$

(just consider the assignment that turns P into a function that always returns false)

But using a standard G system for Classical FOL – with the duplication rules merged with Exists on right and Forall on left[1] – the computation would never stop. We'd get,

|– Exists $x . P(x)$

|– $P(y_1)$, Exists $x . P(x)$

|– $P(y_1)$, $P(y_2)$, Exists $x . P(x)$

|– $P(y_1)$, $P(y_2)$, $P(y_3)$, Exists $x . P(x)$

etc.

To be able to say it's falsifiable, I'd need to get only atomic formulas in the sequent, but that will clearly never happen. I know I'm probably messing something up, though. Any comments?

Thanks,

Z

[1] Like the one presented at (pag 187):

<http://www.cis.upenn.edu/~jean/gbooks/logic.html>