[conjecture]

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Non-classical logic and undecidability

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Abstract

We elaborate a conjecture by applying the definition of Non-Axiomatic System [1] in Non-Classical Logic.

keywords: non-classical logic, undecidable proposition, non-axiomatic system

The most updated version of this paper is available at

<https://osf.io/h4f7p/download>

Introduction

1. Non-classical logic extends classical logic [2].

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Non-classical proposition

2. *This sentence is false.*
3. (2) can be expressed mathematically by $P \equiv \neg P$.
4. P is neither true nor false.
5. Let the truth value of *neither true nor false* be denoted by i , i.e., $\delta(P) = i$.
6. The truth value of a vacuously true sentence $\mathcal{V}_t$ is $\bar{\delta}(\mathcal{V}_t) = i$ [3].
7. Let $\mathcal{NC} = \{F_i : i \in \mathbb{N}\}$, where F_i are mathematical formulas such that $\bar{\delta}(F_i) \neq 0$ and $\bar{\delta}(F_i) \neq 1$.

Definitions

8. D = undecidable theorem
9. NAS = Non-Axiomatic System [1]
10. $\mathcal{NNC} = \mathcal{NC} \cap \mathcal{M}$

Conjecture

11. $((\exists \mathcal{M} \in \text{NAS}) \wedge (\mathcal{NNC} \neq \emptyset)) \rightarrow (\exists D : D \text{ is provable in } \mathcal{M})$

Open Invitation

*Review, add content, and **co-author** this paper [4, 5]. Join the **Open Mathematics Collaboration** (<https://bit.ly/ojmp-slack>). Send your contribution to mplobo@uft.edu.br.*

Open Science

The **latex file** for this paper together with other *supplementary files* are available [6].

Ethical conduct of research

This original work was pre-registered under the OSF Preprints [7], please cite it accordingly [8]. This will ensure that researches are conducted with integrity and intellectual honesty at all times and by all means.

Acknowledgement

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