Gödel Problem Set 1

Due: February 7, 2020

Answer each of the following problems. As always, you must attempt all of them. This time, you must complete all of the easy problems, and one of the hard problems. You need only typeset your complete problems. Good attempts can be submitted in handwritten form, bad attempts must be delivered in the form of interpretive dance.

1   Quiet Desperation (Easier Problems)

1. Rigorously prove propositions I, II, and III in section 2.

2. Establish, and prove, a bijection between all finite but unbounded sequences $\langle x_1, x_2, \ldots x_n \rangle$ where $x_i \in \mathbb{N}$ and $\mathbb{N}$.

3. Using **P**, construct a proof that $\sim a \vee a$ is a tautology.

2   What did we ever do to you? (Harder Problems)

1. Rigorously prove that **P** is equivalent to **PM**.

2. Fully expand all of the abbreviations used in the axioms into the language of **P**. Use your expansions to find the Gödel number of the 3 axioms in section I of the axioms.