Computability and Logic

HW 4

Due: Friday, March 13

Please submit LPL exercises using Submit! You can email to me all other Fitch files or other electronic files in a .zip file.

1. Formal Proofs in Arithmetic: LPL 16.31, 16.34, 16.35, 16.39, 16.41, 16.46. Submit with Grade Grinder.

2. Show that $\forall x\,(x \neq 0 \rightarrow \exists y\, s(y) = x)$ is not a FOL consequence of PA1 through PA6

3. Use mathematical induction to show that for any two numbers m and n, you can prove the FOL statement $\underline{m} \times \underline{n} = \underline{m \times n}$ from PA1 through PA6 in system F, where $\underline{n}$ is the FOL expression s(s(s(…(s(0)…))), i.e. n successive applications of the successor function symbol applied to the 0 constant symbol. In your proof, you can assume (as shown in class) that for any two numbers m and n, you can prove the FOL statement $\underline{m} + \underline{n} = \underline{m + n}$ from PA1 through PA6 in system F.