My logic exercises

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Contents

Part I

Chapter 1

Introduction

Chapter 2

Syntax of First-Order Languages

2.1 Alphabets

2.1.1

This exercise is handled in real analysis/set theory course, as well all other exercises in this section. First one was handled in NIP section of the real analsys course, second one is in set theory course and proof of which stems from the existence of injection from $\omega \times \omega$ to ω, and the third one was proven in both books under the section of Cantor's Theorem

2.2 The Alphabet of a First-Order Language

2.3 Terms and Formulas in First-Order Languages

2.4 Induction in the Calculi of Terms and of Formulas

2.4.1

(a) Let the calculus C_v consist of the following rules:

$$\overline{x \ \ x}$$

$$\frac{y \ \ t_i}{y \ \ ft_1...t_n} \ \textit{if } f \in S \textit{ is n-ary and } i \in \{1,...,n\}$$

Show that, for all variables x and all S-terms t, xt is derivable in C_v, iff $x \in var(t)$