

## MATHEMATICAL LOGIC — ASSIGNMENT THREE

- (1) Write down the notion of term in the Simple Theory of Types.
- (2) Prove Cantor's Theorem: for any set  $A$ ,  $A \prec \wp(A)$ .
- (3) Assume to know that if  $h: X \rightarrow Y$  is surjective then there is  $Z \subseteq X$  such that  $h$  restricted to  $Z$  is a bijection to  $Y$ .  
Show that if  $f: A \rightarrow B$  and  $g: B \rightarrow A$  are both surjective, then  $A \approx B$ .

Each question is worth 12 points. The points in all the four assignments will be added together and the result will be divided by 4, and this will be the final result. Remember to mark your answer sheet with your name.

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*Date:* May 15<sup>th</sup>, 2024.