

Logics and Mathematics – 3rd lecture

Exercise sheet

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Problem 1 Give the truth tables for the following formulas:

(1) $(A \wedge B) \rightarrow C$

(2) $A \rightarrow (B \rightarrow A)$

(3) $(A \rightarrow (B \rightarrow C)) \rightarrow ((A \rightarrow B) \rightarrow (A \rightarrow C))$

Problem 2 Give the negation of the following formula, and move the negation side as far inside as possible:

$$\forall x \in A \exists y \in B : P(x, y)$$

Problem 3 Prove the following formula (A, B, C are sets):

$$A \subseteq B \wedge B \subseteq C \rightarrow A \subseteq C$$

Problem 4 If is a natural number $n \geq 4$, then not all factors of $\{n, n + 2, n + 4\}$ are prime numbers.