

EXERCISE SHEET: PROPOSITIONAL PROOF THEORY

Exercise 1: Currying

Prove that for any $n \geq 1$, the following formula has a sequent calculus proof:

$$(A_1 \wedge (A_2 \wedge (\cdots \wedge A_n) \cdots) \rightarrow B) \rightarrow (A_1 \rightarrow A_2 \rightarrow \cdots \rightarrow A_n \rightarrow B)$$

Remember that $A \rightarrow B \rightarrow C = A \rightarrow (B \rightarrow C)$

Exercise 2: Natural Deduction can Simulate Sequent Calculus

Give a constructive proof that if $\Gamma \vdash_G \Delta$ then $\Gamma \vdash_N \bigvee \Delta$.

Exercise 3: Hilbert System

Prove that $\vdash_H F \wedge G \rightarrow G \wedge F$. You may use the deduction theorem.