

LING 130: Sample Quiz 1

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1. Natural Deduction: Propositional Logic

Use **pr** for premise and **as** for assumption.

Prove the following: $p \rightarrow q, r \rightarrow s \vdash p \wedge r \rightarrow q \wedge s$

2. Natural Deduction: First-order Logic

Use **pr** for premise and **as** for assumption.

Prove the following: $\forall x[P(x) \wedge Q(x)] \vdash \forall x[P(x)] \wedge \forall x[Q(x)]$

3. First-order Logic Translation

Translate into a first-order expression.

No student attended every lecture.

4. Propositional Logic Truth-table

Fill in the truth table for the following expression: $(p \vee q) \rightarrow \neg r$

5. Types and Type Derivations

Give the type and semantic expression for each of the following words:

- a. *friend*
- b. *admire*
- c. *slowly*
- d. *any*

6. Quantifiers and Entailment

Explain why the quantifier *a* allows for deductions involving \wedge -elimination.