

Review Sheet: Exam 1

PROBLEMS

1. **Axiomatic proofs** in propositional logic: know how to do basic axiomatic proofs (both showing that a particular formula is a theorem, and that a particular formula is provable from a given set.)
2. **Propositional logic validity proofs**: know how to establish that a particular formula is valid, and that a particular formula is a semantic consequence of a given set of formulas.
3. **Sequent proofs**: make sure you know the sequent rules, and can do sequent proofs.
4. **Nonstandard symbolizations**: know how to symbolize sentences using Polish notation, and using the Sheffer stroke.
5. **Three-valued logic**: know how to do truth tables in all three systems.
6. **Predicate logic validity and invalidity proofs** in all our systems of predicate logic (standard predicate logic, identity, function symbols, and definite descriptions (ι)). The validity proofs require general reasoning about models, assignments to variables, etc.; invalidity proofs require constructing countermodels.
7. **Predicate logic symbolizations** in all our systems of predicate logic. Know how to eliminate definite descriptions using Russell's method.

CONCEPTS

8. **Basic concepts** of metalogic: logical constants, logical particles, metalanguage versus object language, extensions versus deviations versus variations, etc.
9. **Grammar** of propositional logic and predicate logic: definition of a wff, definition of a term, official versus unofficial connectives.
10. **Provability**, basic concepts. Know the definition of a theorem in an axiomatic system, and the definition of a provable sequent. Know the axioms and rules of our axiomatic system for propositional logic, and know the rules of proof in our natural deduction system (sequents).
11. **Semantics**, basic concepts. Know the definition of a PL interpretation, and the definition of a model for our various predicate logic systems. Know the definition of denotation, the definition of truth in an interpretation, the definition of an assignment to the variables, etc.
12. **Semantic metatheorems**: know what soundness and completeness mean.
13. **Adequate connective sets**: know what it means to say that a truth function can be expressed with given connectives, and be familiar with arguments that a certain truth function *cannot* be expressed given certain connectives.
14. **Metalanguage proofs**: understand the basic idea of proofs by induction, and be able to do elementary inductive proofs.