MATH 110   Final Exam Study Guide

The final exam will be 2 hours long and will consist of 12 problems (some with multiple parts).

The exam is cumulative, so review all the concepts, properties, and examples covered in this course. Use the following list as a guide. It is also a good idea to review all homework and exam problems.

1. Truthtellers and liars puzzle.
2. Statements, truth values of statements, open statements.
3. Logical connectives (operations), order of operations.
4. Truth tables.
5. Expressing operations in terms of others.
6. Logical equivalence.
7. Fundamental logical equivalences.
8. Proving other logical equivalences from the fundamental ones.
9. Tautology, contradiction.
10. Axioms, Modus Ponens, deriving tautologies from axioms.
11. Sets, subsets.
12. Cardinality of a set, power set.
13. Set operations.
14. Indexed collection of sets, operations with it.
15. Venn diagram.
16. Proving a set identity.
17. Fundamental identities in set theory.
18. Similarities between logical and set operations.
19. Interpretation of formulas in sets.
20. Formulas valid in sets.
21. Quantifiers.
22. Negations of quantified statements.
23. Nested quantifiers.
24. Properties of quantified statements.

25. Proving quantified statements.

26. Paradoxes in logic and set theory.

27. Modal operators box and diamond, their interpretations.

28. Axioms, Necessitation Rule.

29. Proving formulas from axioms.

30. Modal logics, sublogic relationships.

31. Topological spaces.

32. Open and closed sets, interior and closure.

33. Interior and complement problem.

34. Interpretations of modal logics in topological spaces.

35. Formulas valid in topological spaces.

36. Soundness and completeness of S4 over all topological spaces.