Review for Exam 1

MATH 135: First Steps into Advanced Mathematics

Some Types of Problems:

Below are listed **some** of the types of problems that may appear on the exam. After most of them is listed a place to look for an example of such a problem. Note that there are variations of most of these types of problems that will not be covered by one example.

(1) construct a truth table for a statement and use it to explain some characteristics about the statement (Section 2.4: 4(b))

(2) write the contrapositive and converse of a statement (2.3 Check Yourself: 6)

(3) write a statement in if-then form (2.3 Check Yourself: 3) and know the equivalent forms (See Hammack's book page 43)

(4) negate a statement (2.3 Check Yourself: 8; Section 2.4: 2)

(5) given a statement, state the assumptions and final conclusion you would make if proving the statement by direct proof, proof by contraposition and proof by contradiction (Groupwork on February 9)

(6) prove a statement with one of the methods above or find a counterexample to the statement

(7) given a set, list its power set (2.2 Check Yourself: 5)

(8) use element arguments to prove statements about sets or power sets of sets (Groupwork on January 31-February 2, and February 7)

(9) decide what is an element and what is a subset of a power set (Groupwork on February 7)

(10) given a proof, correct or evaluate its accuracy

(11) solve counting problems using the sum and product principles (Section 1.7: 1, 2, 5, 6, 9,...)

(12) solve questions using the Pigeonhole Principle (Section 1.7: 11, 17, 22, 24, 25)

(13) find unions and intersections of sets (Groupwork on February 16)

Be sure to...

(1) review your definitions (you should have a vocabulary list in your journal with words/phrases like vacuously true, subset, etc.) and theorems.

(2) practice problems with**out** your book or notes or collaborators.

(3) explicitly state which type of proof you are using (especially contraposition and contradiction).

(4) bring a pencil (or several!) with a good eraser.

(5) ask me questions if you are stuck or need clarification.

(6) breathe!

NOTE: There may be true/false and short answer questions in addition to problems. For example, I may ask you to give an example of something (like a true statement whose converse is false) or show there are no such examples. I could also ask you to explain the definition of a term.

NOTE: This is a **rough** guideline. The exam will be over chapters 1 and 2. You should be sure to review all of your homeworks, groupwork, journal and notes from these chapters.

REMEMBER: As you know from the syllabus, our exam will be Tuesday, February 21 from 7:15PM until 9:15PM in Napier 101.

REMEMBER: Bring your journal (a composition book) with you to the exam to be submitted. Catch up on any unfinished journal work and/or revise the work you have done as a review for the exam. Mark each entry clearly by exercise, problem or theorem number, or by question and highlight that mark. Make it clear which are rough drafts and which are final drafts if you entered an exercise more than once.