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 44)

(4) negate statements (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 11)

(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 30 and February 9)

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

(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 including of indexed sets (Groupwork on February 18)

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, group work, journal and notes from these chapters.

REMEMBER: Our exam will be Tuesday, February 25 during our regular class time; we can begin as soon as everyone is present.