TEST 1 - STUDY GUIDE

Bridge - MGF 3301 - Section 001

When? The first test will take place on **Wednesday February 12 at 9:30 am** in CMC 118.

Topics: **Sections 1.1, 1.2, 1.3, 1.4** of the textbook *A Transition to Advanced Mathematics*, by Smith, Eggen & St. Andre, 8th edition.

Office hours:

- Monday February 10: 11am-12pm
- Tuesday February 11: 4-5:30pm.

For the first test, you need to be able to:

- Attribute the truth value to easy propositions.
- Know the truth tables of the five logical connectives: $\sim P$, $P \wedge Q$, $P \vee Q$, $P \Rightarrow Q$, $Q \Leftrightarrow P$.
- Write down the truth table of a propositional form.
- Determine whether two propositional forms are equivalent, whether a propositional form is a tautology, whether a propositional form is a contradiction.
- Use De Morgan's Laws.
- Write the converse and the contrapositive of a conditional sentence.
- Determine the truth set of an open sentence.
- Use the quantifiers $\forall$, $\exists$ and $\exists!$
- Determine the truth value of propositions such as "$\forall\, x, P(x)$", "$\exists\, x$ such that $P(x)$", "$\exists!\, x$ such that $P(x)$", by justifying properly the answer.
- Write non-trivial denials of different kinds of propositions (also containing quantifiers).
- Make use of definitions in a proof.
- Prove directly conditional sentences.
- Solve problems such as the in-class activity *Murder Mistery*.
- Know all the definitions that appear in the next page.

Review:

- Quizzes 1,2,3 (and their solutions).
- Homework 1,2,3,4.
- In-class activity *Murder Mistery*.
- Read again all the notes and/or Sections 1.1, 1.2, 1.3, 1.4 of the textbook.

Definitions

- Two propositional forms are **equivalent** if and only if they have the same truth tables.
- A **tautology** is a propositional form that is true for every assignments of truth values for its components.
- A **contradiction** is a propositional form that is false for every assignments of truth values for its components.
- Let P and Q be propositions. The **converse** of $P \Rightarrow Q$ is $Q \Rightarrow P$. The **contrapositive** of $P \Rightarrow Q$ is $(\sim Q) \Rightarrow (\sim P)$.
- An integer n is said to be **even** if and only if $\exists\, k$ in $\mathbb{Z}$ such that $n = 2k$.
- An integer n is said to be **odd** if and only if $\exists\, k$ in $\mathbb{Z}$ such that $n = 2k + 1$.
- Given m and n in $\mathbb{Z}$, the integer n is said to be **divisible by** m if and only if $\exists\, k$ in $\mathbb{Z}$ such that $n = km$.