Review for Exam 1, Thursday, October 3, 2019

MATH 110: Discovering in Mathematics

Notes:

(1) To prepare for the exam, be sure that you have reviewed all class notes and chapters one and two in the text. Below is a list of some types of problems you should know. This is not meant to be exhaustive.

(2) Remember that HOW you solve the problems is more important than what your final answers are. Be sure to justify ALL your work. Read the directions carefully! **Most solutions will require sentences!**

(3) Bring a pencil (or several!) with a good eraser.

(4) Neatness is a plus! Make sure I can follow your work on your exam.

(5) Remember that your journal is due at the exam. Double check to make sure you have completed all problems listed for your journal work. Doing these will help you review for the exam. I will be grading three to four problems completely and checking to see whether you have worked on the rest. Be sure your journal follows the guidelines to obtain credit!

(6) I will provide you with a non-graphing calculator for the exam.

(7) There will be randomized seating at the exam. You may want to wait until the names have been laid out on desks before taking a seat.

Some Types of Problems:

For all of these problems you should be able to explain the process and show the details, not just obtain a final answer.

(1) Solve a logic problem and describe how Polya's method helps/applies to your work. Details about Polya should be in your notes from the first day of class!

(2) Use the Pigeonhole Principle to answer a question. Be sure to use its name and identify the "pigeons" and the "holes" whenever you apply it. You may not be explicitly asked to use it, but you should realize when it applies.

(3) Discuss the Fibonacci numbers and apply your knowledge of them.

(4) Explain what the Golden Ratio is and one of the places where it appears.

(5) Play a game of Fibonacci Nim, figure out what the next move is given a set of first moves, and so on, given the strategy proved in class.

(6) Know the Division Algorithm and the Prime Factorization Theorem and how to apply them.

(7) Explain what a conjecture is and describe some famous, long unsolved ones.

(8) Perform modular arithmetic.

(9) Check whether a UPC symbol is correct, find a missing digit, explain an error, etc.

(10) Any problem that is like a journal problem!