MATH 101 FINAL EXAM STUDY GUIDE

COMMENTS: I wrote this up because I wanted to provide you with a list of things to be absolutely sure to know as you prepare. I am hoping this will help you focus your studies, as preparing for a cumulative exam in a transfer-level mathematics class can be a daunting task! Please note that is intended to be a help, but it is not a promise or absolute certainty that exactly and only these things will be included, but if you do know these things you should do very well!

Know all of the things that WE DISCOVERED - this includes especially the rules for when a graph is traversable (i.e. when it has an Euler Graph or an Euler Circuit) - and information about polygon angle measures and which polygons tessellate.

GRAPH THEORY - know about Steiner Points and how to find the shortest network - know about traversability of graphs - know about Hamiltonian Circuits and how to find cheap routes - know about determining whether or not graphs are identical (whether or not they look the same) - be able to take an image, such as the Konigsberg Bridge problem or one of the 'room' problems from your extended syllabus, and draw a graph that represents it.

FRACTALS - be able to draw fractals - be able to draw stage 2 if you are given stages 0 and 1 - be able to draw stages 0 and 1 if you are given stage 2 - be able to find the self-similarity dimensions of a fractal - be able to find the area of a fractal - be able to count the number of smaller copies of the original in a fractal - be able to determine the relative size of smaller pieces in a fractal

NUMBER THEORY - be able to find factors of numbers - be able to determine if numbers are prime, composite, abundant, deficient, perfect, and/or Mersenne - be able to multiply in Egyptian - be able to count in other bases - be able to add and subtract in other bases - be able to convert numbers into and out of base 10

POLYGONS - know the formulas for angle measures and know where they come from and what they mean - know which regular polygons tessellate and which ones do not and why - know how to find angle measures in shapes (including star shapes, but other, related shapes as well)

LOGIC - be able to do deal with problem-solving situations such as were in your extended syllabus (pages 49-61), things like the light bulb problem and the telephone number problem - be able to identify work as being inductive or deductive reasoning - know the symbols used in logic, and be able to translate back and forth between statements and symbols - be able to determine whether or not something is a statement - be able to evaluate syllogisms for validity - be able to fill in truth tables - be able to use truth tables to determine if two statements of logic are equivalent

SET THEORY - know how to use Cantor's definition to show that sets are infinite or finite - know what subsets and proper subsets are - know how to shade in Venn Diagrams - be able to use Venn Diagrams to determine if two set theory statements are equivalent - know how to read and use set-builder notation - know the notation used in set theory - be able to do 'counting problems' (such as determining the number of possible license plates of a given form and other such problems)

FOURTH DIMENSION - know some stuff about the fourth dimension, such as how to draw a hypercube, how to find how many faces, edges, etc. a hypercube has, and know what sorts of seemingly magical things you could do if you could move freely into the fourth dimension.

HISTORY - There WILL be a section on math history very much like the one on the sample test I have posted online. Be sure to have your notes in order (and read over this part at least) before the exam so that you can readily identify the described mathematician. (It would be a good idea to go through these notes ahead of time and for each mathematician highlight their major math contribution, one interesting life fact and the year of birth.)

REMEMBER TO STUDY FOR THIS TEST EVEN THOUGH IT IS OPEN NOTE. IF YOU COME IN NOT HAVING STUDIED YOU ARE GOING TO HAVE A VERY HARD TIME FINDING WHAT YOU NEED IN ALL YOUR NOTES THAT YOU'VE TAKEN OVER THE COURSE OF A SEMESTER. GO THROUGH YOUR NOTES PRIOR TO THE FINAL AND MARK THE IMPORTANT PARTS (WITH TABS, HIGHLIGHTING, PAPER CLIPS, WHATEVER) SO YOU CAN FIND THEM QUICKLY AND EASILY WHEN THE TEST IS IN FRONT OF YOU!