

MATH 219 - Study Guide for Final Exam

General Remarks

Study class notes, tests, graded homework solutions, other homework
Be able to use ALL definitions, propositions, theorems, corollaries

Be able to state and use

Definitions from counting, graph theory, posets, lattice theory

Theorems With Names:

Binomial Theorem	Bridge Theorem
Euler's Theorem ($v-e+f=2$)	Four and Five Color Theorems
Union Theorem	Edge Theorem
Euler's Circuit/Path Theorems	Topological Sorting Algorithm
Poset Representation Theorem	Antichain Theorem
Dilworth's Chain Theorem	Principle of Duality

Lattice Theory Theorems:

Be able complete the statements of Theorem 1 through
Theorem 6 given partial statements

Be able to

Do counting problems and use the Binomial Theorem
Determine if a graph is planar, is a tree, or has bridge
Determine if two graphs are isomorphic
Determine the chromatic number and chromatic polynomial of a graph
Determine if a graph has an Eulerian circuit or path
Draw a Hasse diagram of a poset
Find maximal and minimal elements of a poset
Determine length and width of a poset
Partition a poset into chains and antichains (using the theorems)
Determine lubs, glbs, sublattices, complements
Give and use examples of lattices: $\mathcal{P}(X)$, $\mathbf{2}$, $\mathbf{3}$, $\mathbf{2}^n$, M_3 , N_5 , etc.
Use Boolean algebras to simplify and redraw circuits

Lattice Proof to Know

Theorem 2, the Lemma before Theorem 3, and
Propositions 1 and 2 before Theorem 6