Math 199 Study Guide for Final

Study: notes, tests, graded homework, homework sheets, old finals

Main Topics:
Sets and Functions
Mathematical Induction
Equivalence Relations and Partitions
Size of Sets

Know how to:
state definitions
do graded homework and homework sheet problems
give examples and work examples
show sets are countable or uncountable

Types of proofs to know:
subset / equality of sets if, then if and only if
and / or statements for all / there exists contrapositive
contradiction 1-1 / onto irrationality of numbers
invertibility direct / inverse image induction
equivalence relations isomorphism countability / uncountability

Know definitions and terminology:
converse contrapositive contradiction
natural number integer rational number
real number irrational number subset
union intersection difference
power set even integer odd integer
cartesian product function graph
domain codomain composition
one-to-one onto invertible function
inverse function inverse image direct image
basis for induction induction step induction hypothesis
d divides n equivalence relation equivalence class
the quotient of X by R congruence (mod n) partition
bijection isomorphic finite
infinite countable uncountable

Big Proofs:
Theorem 3: $\mathbb{Q}$ is countable.
Theorem 4: $\mathbb{R}$ is uncountable.

Remark: The final exam will include a reference page of statements of the major propositions, theorems, and corollaries from the last two weeks of class.