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	contadiction
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.