

List of Theorems for Mth 435 Final

Parts of the proofs of the following theorems could appear on the final exam.

Real Analysis

1. Theorem 0.7
Equivalence of well-ordering principle, mathematical induction and strong induction.
2. Theorem 1.16
The Archimedean Principle.
3. Theorem 1.25
A countable union of countable sets is countable.
4. Theorem 2.10
A bounded monotone sequence is convergent.
5. Theorem 2.13
A sequence of real numbers is convergent if and only if it is Cauchy.
6. Theorem 3.16
The Intermediate Value Theorem
7. Theorem 3.17
The Extreme Value Theorem
8. Theorem 3.28
 f continuous on $[a, b] \implies f$ uniformly continuous on $[a, b]$.
9. Theorem 4.11
Rolle's Theorem
10. Theorem 4.12
The Mean Value Theorem

Metric Spaces

1. Theorem I.9
An arbitrary union of open sets is open and a finite intersection of open sets is open.
2. Theorem II.7
 F closed iff all points adherent to F are in F .
3. Theorem II.8
 x adherent to F iff there exists a sequence in F converging to x .
4. Theorem II.9
 F closed iff all convergent sequences in F have limit in F .
5. Theorem III.6
The inverse image of an open set under a continuous function is open.
6. Theorem III.7
A composition of continuous functions is continuous.
7. Theorem IV.6
A closed subset of a complete metric space is complete.