List of Real Analysis topics for Test 1

1. Definitions of ordered field, function, domain, and range. Absolute value as a distance. Triangle inequality with proof.

2. Definitions of real numbers, upper and lower bounds, least upper bound, and greatest lower bound of a set, maximum and minimum. Axiom of completeness.

3. Lemma 1.3.8 (Characterization of the supremum of a set) with proof.

4. Theorem 1.4.1 (Nested Interval Property) with proof.

5. Theorem 1.4.2 (Archimedian Property) with proof.

6. Theorem 1.4.3 (Density of rational numbers) with proof.

7. Definitions of one-to-one, onto functions. Equivalence relation on sets, cardinality, examples of countable and uncountable sets.

8. Proof that real numbers are uncountable.

9. Statement of Schroder-Bernstein theorem.

10. Definitions 2.2.3 and 2.2.3 B of convergence of a sequence.

11. Every convergent sequence is bounded (with proof), Algebraic Limit Theorem (with proof). Order Limit Theorem (with proof).

12. Monotone Convergence Theorem (with proof).

Good luck!