List of Real Analysis topics for Test 2

1. Definition of convergence of a series, sum of an infinite geometric progression (with proof). Cauchy Condensation Test (with proof).

2. Definition of subsequence. Subsequences of a convergent sequence converge (with proofs). Bolzano-Weierstrass Theorem (with proof).

3. Definition of a Cauchy sequence. Cauchy sequences are bounded (with proof). Sequence converges if and only if it is Cauchy (Cauchy Criterion) (with proof).

4. Algebraic Limit Theorem for series. Cauchy Criterion for series. Necessary condition of convergence (Theorem 2.7.3 with proof). Comparison test (Theorem 2.7.4 with proof). Absolute convergence test (with proof). Alternating series test (with proof). Definitions of absolute and of conditional convergence.

5. Definitions of open set, limit point, isolated point, closed set, closure of a set, complement of a set. Theorem 3.2.3 (unions and intersections of open sets, with proof), Theorem 3.2.5 (characterization of a limit point, with proof), Theorem 3.2.8 (with proof), Theorem 3.2.13 (with proof), Theorem 3.2.14 (with proof).

6. Definitions of a compact set, bounded set, open cover, finite subcover. Theorem 3.3.4 (Heine-Borel Theorem with proof), Theorem 3.3.5 (compact nested sets, with proof), statement of Theorem 3.3.8 (characterization of compact sets).

Good luck!