List of Real Analysis topics for Test 3

1. Definitions of a compact set, bounded set, open cover, finite subcover. Theorem 3.3.4 (Characterization of compactness with proof), Theorem 3.3.5 (Nested Compact Set Property, with proof), statement of Theorem 3.3.8 (Heine-Borel theorem).

2. Definitions 4.2.1 and 4.2.1B (Functional Limit). Theorem 4.2.3 (Sequential criterion for functional limits, with proof), Corollary 4.2.4 (Algebraic limit theorem, with proof), Corollary 4.2.5 (Divergence criterion for functional limits).

3. Definition 4.3.1 (continuity at a point), Theorem 4.3.2 (Characterization of Continuity), Corollary 4.3.3 (Criterion for discontinuity), Theorem 4.3.4 (Algebraic continuity theorem), Theorem 4.3.9 (Composition of continuous functions, with proof).

4. Theorem 4.4.1 (Preservation of compact Sets, with proof), Theorem 4.4.2 (Extreme value theorem, with proof). Definition 4.4.4 (Uniform continuity), Theorem 4.4.5 (Sequential criterion for nonuniform continuity, with proof), Theorem 4.4.7 (Uniform continuity on a compact set, with proof).

5. Theorem 4.5.1 (Intermediate value theorem, with proof).

6. Definition 5.2.1 (Differentiability), Theorem 5.2.3 (Differentiability implies continuity, with proof), Theorem 5.2.4 (Algebraic Differentiability Theorem, with proof).

Good luck!