Guidelines for Exam 1

MATH 471

- **Theorems you are expected to be able to prove**:
  1. If a sequence $\{a_n\}_{n=1}^{\infty}$ is convergent, then $\{a_n\}_{n=1}^{\infty}$ is bounded.
  2. The Monotone Convergence Theorem
  3. A sequence converges to a point a if and only if every subsequence converges to the same limit a.
  4. The Extreme Value Theorem for continuous functions
  5. A continuous function on a closed and bounded set is uniformly continuous.
  6. A Lipschitz function is uniformly continuous.
- **Theorems you are expected to be able to apply**:
  1. All of the above
  2. Operations on sequences: sum, difference, product, etc. of convergent sequences is also convergent.
  3. Comparison Theorem, Sandwich/Squeeze Theorem
  4. The Bolzano-Weierstrass Theorem
  5. The sum, difference, product, and ratio of continuous functions is continuous.
  6. The composition of two continuous functions is continuous.
  7. The Intermediate Value Theorem for continuous functions.
- **Must be able to clearly state all the definitions:** For example: convergent sequence, bounded sequence, greatest lower bound, least upper bound, monotone increasing/decreasing sequence, subsequences, closed set, continuous function, uniformly continuous function, limit of a function, etc.
- **Be familiar with all the examples and counter-examples discussed in class.**
- **Be familiar with all the problems from Homeworks 1-3. Consider going over the solutions provided for each homework.**