Guidelines for Exam 1

MATH 472

- **Results you are expected to be able to prove**:

  1. Geometric Series Formula: For a number r such that $|r| < 1$,

  $$\sum_{k=0}^{\infty} r^k = \frac{1}{1-r}.$$

  2. If the series $\sum_{n=1}^{\infty} a_n$ converges then $\lim_{n\to\infty} a_n = 0$.
  3. The Comparison Test
  4. If $\{f_n\}$ is a sequence of continuous functions that converges uniformly to the function f then the limit function f is also continuous.
  5. If $\{f_n\}$ is a sequence of integrable functions that converges uniformly to a function f then the limit f is integrable and $\lim_{n\to\infty} \int_a^b f_n = \int_a^b f$.

- **Theorems you are expected to be able to apply**:

  1. All of the above
  2. The Integral Test
  3. The p-Test
  4. The Alternating Series Test
  5. The Ratio and Root tests
  6. Theorem on uniform convergence of a sequence of continuously differentiable functions

- **Must be able to clearly state all the definitions**
- **Be familiar with all the examples and counter-examples discussed in class.**
- **Be familiar with all the problems from Homeworks 1-3.**