MAT 319 Spring 2015
Review for Midterm 2

This midterm will cover material in Ross, through §16 (except §§12 and 13). There will be questions in which students are asked to give one of the following definitions:

- The sequence (s_n) converges to s. (Ross, Definition 7.1)
- The sequence (s_n) is a Cauchy sequence. (Ross, Def. 10.8)
- The series $\sum_0^\infty a_n$ converges. (Ross, §14.2)
- State the Ratio Test. (Notes on series and Ratio Test)

and to prove one of the following theorems:

- The limit of a sequence is unique. (Ross, end of §7)
- Every monotone, bounded sequence converges. (Ross, 10.2)
- If a series $\sum a_n$ converges, then $\lim a_n = 0$. (Notes on series and Ratio Test)
- Geometric series: $\sum_{k=0}^\infty ar^k$ converges to $a/(1-r)$ if $|r| < 1$ and diverges otherwise. (Ross, §14, Example 1)
- $e = \sum_{k=0}^\infty \frac{1}{k!}$ is irrational. (Ross, §16, Example 6)
- An infinite decimal corresponds to a rational number if and only if it repeats. (Ross, 16.5)

Other problems will include applications of the Comparison Test, the Ratio Test, the Integral Test, and the Alternating Series Test to various specific series. Review Exercises 14.1-4 and 15.1-4.