Study Guide for Midterm 1

- Sec. 7.1:
  Find the limit of a sequence. Determine the convergence of a sequence.
  Examples:2-12. Practice Problems:11,31,43,53,65.

- Sec. 7.2:
  Convergence and divergence of a series; geometric series; p-series; k-th term test for divergence.
  ExamplesExamples: 1-7. Practice Problems:1, 13, 17, 37, 39, 41.

- Sec. 7.3:
  Integral Test; Comparison Test; Limit Comparison Test.
  Examples: 1-9. Practice Problems:1, 11, 37, 41, 45, 57.

- Sec. 7.4:
  Alternating Series Test; Error estimate.
  Examples: 1-6. Practice Problems:1, 11, 41, 43.

- Sec. 7.5:
  Absolute Convergence and Conditional Convergence; Ratio Test; Root Test.
  Examples: 1-8. Practice Problems: 7, 13, 25, 35, 40.

- Sec. 7.6:
  Interval and Radius of Convergence; Term-by-term differentiation and integration.
  Examples: 1-6. Practice Problems: 1, 3, 11, 21, 39.

- Sec. 7.7:
  Taylor's Theorem; Derive a Taylor series or polynomial; Find new Taylor series from old ones.
  Examples: 1-8. Practice Problems: 1, 5, 33, 41.

- Sec. 7.8:
  Use Taylor polynomials to approximate a function, to find the limit and to approximate an integral. Examples: 1-5. Practice Problems: 7, 11, 13, 15.

- Sec. 7.9:
  Find a Fourier series expansion of a function.
  Examples: 1-2. Practice Problems: 9, 13. (Note: Change the interval to $[\pi, \pi]$

- Sec. 7.10:
  Use series to solve differentiation equations; Find the recurrence relation; Determine the general terms.
  Examples: 1-3. Practice Problems: 1.

- Sec. 8.3:
  The dot product; Projections.
  Examples: 1-5. Practice Problems: 1, 7, 11, 17, 21.

- Sec. 8.5:
  Parametric equations and symmetric equations of a line.
  Examples: 1, 2. Practice Problems: 1.