

## Study guide for Midterm 01

Midterm problems include both the lecture contents and homework problems.

1. Review study guide for quiz 01-04 (section 8.8, 10.1-10.8(Part I)). In particular, pay attention to the items listed in the study guides but did not appear in the quizzes (due to time constraint).
2. Section 10.8 (Part II):  
Memorize an example with  $T_{f,a}(x) \neq f(x)$  on  $x \neq a$ .  
Study how to generate  $T_{f,a}(x)$  alternatively using Theorem A in Lecture 09.
3. Section 10.9:  
Study the statement of Taylor's Theorem (Taylor's formula).  
Study the Remainder Estimation Theorem and application on elementary functions.
4. Section 10.10:  
Memorize the binomial series and the Taylor series of basic functions in Table 10.1 (page 658).
5. Section 10.10: Review the application of Taylor series in
  - (a) Approximating functions and integrals and the error estimate (such as section 10.10, problems 15-28).
  - (b) Indeterminate forms (section 10.10, problems 29-40 and Chap 10, Practice Exercises, problems 73-79).
  - (c) Identifying a function from its power series representation. Practice on variants of the functions in Table 10.1: Perform differentiation/integration on them and see if you can recognize the resulting new series. Then practice on examples such as section 10.10, problems 41-52 and Chap 10, Practice Exercises, problems 51-56.