MATH112Z CALCULUS II, FALL 2019
MIDTERM 2 REVIEW

Midterm 2 covers topics in Section 9.1–9.5 (differential equations) and Section 11.1–11.3 (sequences and series). More specific topics are listed below.

(1) Sec. 9.1 and 9.4: understand basic concepts of differential equations (e.g. solution, equilibrium solution, etc.); know how to set up differential equations.

(2) Sec. 9.2: identify direction fields for differential equations; be able to apply Euler's method to obtain approximate solutions.

(3) Sec. 9.3 and 9.4: find solutions of separable equations (both general solution and solution of IVP); find and understand the solutions of population models (natural growth model and logistic model).

(4) Sec. 9.5: solve linear equations using integrating factor method; be able to find differential equations after substitution; know how to setup and solve mixing problems.

(5) Sec. 11.1: understand the convergence of sequence; determine whether a sequence converges or diverges using various theorems; be able to apply bounded monotone convergence theorem.

(6) Sec. 11.2: understand the definition of convergence of series; be able to use telescoping series and geometric series.

(7) Sec. 11.3: be able to apply integral test and obtain error estimates.

Some suggestions:

- Make sure you understand all the topics listed above.
- Make sure you can do all the homework problems without external helps. There are many exercises similar to the hw problems in the textbook. Please practice and find help if there is any trouble.
- Notice that some problems may take time to solve. You should be familiar with the methods to save time in the exam.

Date: Updated October 27, 2019.