

**Dartmouth College**  
Mathematics 23 - Assignment 4

1. Boyce and DiPrima: Section 2.3: 4
2. Boyce and DiPrima: Section 2.3: 8
3. (Lebl 1.4.9) Suppose there are two lakes located on a stream. Clean water flows into the first lake, water from the first lake flows into the second lake, and water from the second lake flows further downstream. The in and out flow from each lake is 500 liters per hour. The first lake contains 100,000 liters of water and the second lake contains 200,000 liters of water. A truck with 500kg of toxic substance crashes into the first lake. Assume that the water is being continually mixed perfectly by the stream.
  - (a) Find the concentration of toxic substance as a function of time in both lakes.
  - (b) When will the concentration in the first lake be below 0.001 kg per liter?
  - (c) When will the concentration in the second lake be maximal?