Assignment 3

MATH2380 – MATHEMATICS FOR THE ENVIRONMENT – SPRING 2013

Due Friday, January 25 Name: _____

Notice that the due date for this assignment is pushed back as we do not have class on Monday.

Text Problems:

1. Exercise 1.4 (Edison's Algorithm and Lists of Rules) part (i)

Other Problems:

2. At a meeting of the Boulder County Flood and Hurricane Preparedness Association (a fictional group), a man in a cowboy hat claiming to be Marty Walter, never seen before around these meetings, takes the floor to offer his solution to potential flooding of the Barker Reservoir. Given that an uncontrolled flood of that reservoir would send water gushing down Boulder Canyon and onto the helpless people of Boulder (as well as their fluffy pets, their organic gardens, their hybrid cars, their Apple products, their beloved house of tea, and – ultimately – their happiness), the board members of the association decide to allow Marty to speak.

   Marty proposes the following: Several million pounds of rocks, sourced nearby, shall be floated on a barge at the center of Barker Reservoir. In the event of a potential flood situation where the dam at the reservoir's end is near its breaking point, the barge will simply drop the entire load of rocks into the reservoir. Marty claims that this will relieve enough pressure from the dam to avert a flood.

   Reasonably, the board members are puzzled. They turn to you, and ask you to use your knowledge of Edison's Algorithm to state whether or not Marty's proposal might work. As in class, you should start with a smaller problem (please avoid the destruction of Boulder) and you should try to construct an experiment in your own home that may give you working data that may lead to a conclusion. Is Marty correct, or not?

   As with many of the problems I will assign, you may use class time to discuss this with your classmates and I encourage you to do so. I will help guide you, but I will not provide a solution. The point here is that mathematics is more about reasoning, logic, communication of ideas, and truth than it is about everyday calculator sort of computation. There is a logical conclusion to examining Marty's argument (it is provably correct or incorrect) and I'm asking you to find it.

3. What is the sum of the integers from 1 to 200? (If you weren't in class during this discussion, please come to my office hours.)