

Math 307 Quiz 4

October 10, 2014

Problem 1. Give an example of an initial value problem with no solution.

Problem 2. Give an example of an initial value problem with more than one solution.

Problem 3. A zombie outbreak occurs in the city of Seattle! The population P of Seattle initially is 652,404 humans and 1 zombie (patient zero), for a total initial population $P(0) = 652,405$. Each day, the horrifying reality causes human Seattleites to flee the city to safe, remote regions of the Yukon, at a rate equal to $0.01P$, where P is the population of the city (both human and zombie combined). Furthermore, 1 percent of the remaining population H of human Seattleites is zombified each day.

- (a) Set up an initial value problem describing the population P of Seattle (including both humans and zombies) as a function of time
- (b) By solving (a), determine the population P of Seattle (including both humans and zombies) as a function of time
- (c) Using (b) set up (but do NOT solve) an initial value problem describing the population H of human Seattleites as a function of time