MATH 611

Homework 7

1. Exercise 6.9 (Roger and Casella, pg. 196) parts b and c.

1. For each case of the simulation experiment in question 1, compute the acceptance rate.
2. For the situation described in Exercise 5.15 (Roger and Casella, pg. 163), derive the MLE of the model parameters, using the function *gammamixEM* from the R-package ‘*mixtools*’.
3. A person can be in one of four states of mental illness (I: chronically insane and hospitalized, II: dead, III: sane and IV: mildly insane and unhospitalized). States I and II are absorbing states. Of the people in state III, 1.9% will be in state II after one year, 98% will stay in state III and the rest will be in state IV. Of the people in state IV, after one year, 2% will be in state I, 3% in state II and 95% stay in state IV.
   1. Determine the probability that a person who is currently sane, will eventually be chronically insane.
   2. For a person in state III, determine the expected number of years, for which the person will be in state III.