Mathematics 469 - Spring, 2006 - Homework 11

Due April 24.

1. An object has lifetime given by an exponential random variable with mean 7 years. A policy will pay $x$ if the object’s lifetime is less than 1 year and will pay $0.5x$ if the object’s lifetime is at least 1 year but less than 3 years. The expected amount paid by this policy is 200. Find $x$.

2. Suppose with probability 0.7, a policyholder files no claims in a given year. Otherwise, the total size of the claims filed in the year is an exponential random variable with mean 50. Find the probability that the total claims filed in the year is no more than 25.

3. An actuary divides a group of people into 3 categories. Category A consists of 15% of the people, category B consists of 25% of the people, and category C consists of the remaining people. 40% of those in category A, 20% of those in category B, and 15% of those in category C file a claim in a year-long time period. What is the probability that a random person is in category C given that the person does not file a claim in this year-long time period?