

Math 115, Make-up Quiz 4

Name:

Date: Monday November 25

Duration: 20 min.

PROBLEM 1:

A card is drawn and replaced 3 times from an ordinary 52-card deck.

1. Find the probability that 3 hearts were drawn.
2. We repeat the previous experiment 100 times (that is, each experiment consists in drawing and replacing a card 3 times from an ordinary 52 deck). Find the expected number of times 3 hearts are drawn.

PROBLEM 2:

Find the mean, variance and standard deviation:

x	1	4	12
f(x)	1/3	1/2	1/6

PROBLEM 3:

Suppose the life expectancy T (in months) of a laptop's battery is a random variable with density function

$$f(t) = \begin{cases} 0, & t \leq 0, \\ c_1 e^{-t/10}, & 0 < t < 10, \\ c_2 e^{-t/100}, & t > 10. \end{cases}$$

1. Find c_1 and c_2 if the probability that the battery's life is less than 10 months is $1/10$.
2. What is the probability that the battery's life is between 10 and 100 months?
3. If our laptop's battery breaks down before 10 months, we get a compensation of \$800. If it breaks down between 10 and 100 months, the compensation is \$300, and after that there is not compensation. What is the expected compensation the company has to pay per laptop's battery?