

Tutorial 3

October 8, 2020

Question 1

Let N be a Poisson random variable with parameter b , and consider a sequence of N independent Bernoulli trials, each with probability p for success.

Let X be the total number of successes. Find the distribution of X .

Question 2

A random variable X has PDF:

$$f(x) = \begin{cases} cxe^{-x} & x > 0 \\ 0 & \text{otherwise} \end{cases}$$

- (a) Find the value of c which makes $f(x)$ a valid PDF.
- (b) Find the CDF of X .

Question 3

Consider a random variable, X , with a triangular distribution:

$$f(x) = \begin{cases} x & 0 < x < 1 \\ 2 - x & 1 \leq x < 2 \\ 0 & \text{otherwise} \end{cases}$$

Find the mean and variance.

Question 4

A random variable, X , has PDF:

$$f(x) = \begin{cases} x/2 & 0 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$$

Find $\mathbf{P}(X > 1.5 | X > 1)$.

Question 5

A stick of length 1 is split at a point U that is uniformly distributed over $(0,1)$. Determine the expected length of the piece that contains the point p , $0 \leq p \leq 1$.