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12. Exercise: Exponential CDF

Exercises due Mar 13, 2020 05:29 IST Completed

Exercise: Exponential CDF

2/2 points (graded)

Let X be an exponential random variable with parameter 2.

Find the CDF of X. Express your answer in terms of x using standard notation. Use 'e' for the base of the natural logarithm (e.g., enter e^{-3*x}) for e^{-3x}).

a) For
$$x \leq 0$$
, $F_X(x) = egin{bmatrix} 0 & & \\ \hline 0 & & \\ \hline 0 & & \\ \end{bmatrix}$ Answer: 0

b) For
$$x>0$$
, $F_X\left(x\right)=egin{array}{c} & & & \\ & & &$

STANDARD NOTATION

Solution:

- a) Since X is a nonnegative random variable, $F_{X}\left(x
 ight)=\mathbf{P}\left(X\leq x
 ight)=0$ for $x\leq0$.
- b) We have seen that for an exponential random variable with parameter λ and for any a>0, we have $\mathbf{P}\left(X\geq a\right)=e^{-\lambda a}$. Therefore, $F_X\left(x\right)=\mathbf{P}\left(X\leq x\right)=1-\mathbf{P}\left(X\geq x\right)=1-e^{-\lambda x}=1-e^{-2x}$.

Submit

You have used 2 of 3 attempts

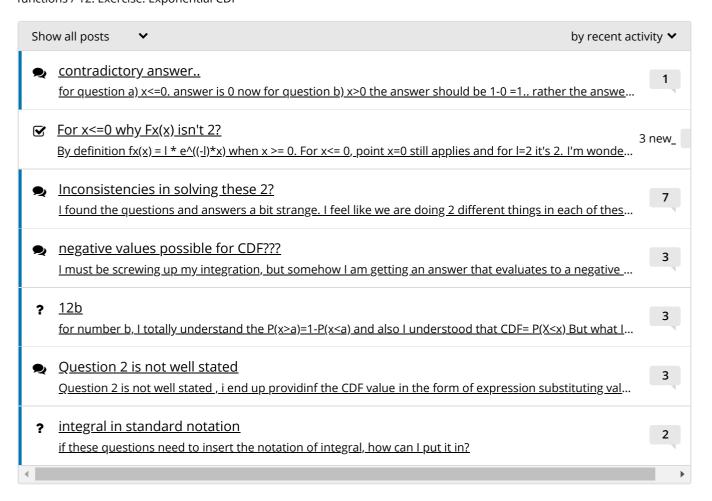


1 Answers are displayed within the problem

Discussion

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Topic: Unit 5: Continuous random variables:Lec. 8: Probability density functions / 12. Exercise: Exponential CDF



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