

Name:

Quiz 5 – 10/4/2023

Instructions. You have 10 minutes to complete this quiz. You may use your plebe-issue TI-36X Pro calculator. You may not use any other materials.

Show all your work. To receive full credit, your solutions must be completely correct, sufficiently justified, and easy to follow.

Problem	Weight	Score
1	1	
2	1	
3	1	
4	1	
Total		/ 40

Problem 1. Let $Y \sim \text{Poisson}(5)$. Compute $\Pr\{Y > 3\}$.

Problem 2. Let $Y \sim \text{Poisson}(73)$. Compute $E[Y]$.

Problem 3. Let $T \sim \text{Erlang}(6, 1/2)$. Compute $\Pr\{T \leq 2\}$.

Problem 4. Let $G \sim \text{Exponential}(1/5)$. Compute $\Pr\{4 < G < 6\}$.

	$X \sim \text{Poisson}(\mu)$	$X \sim \text{Exponential}(\lambda)$	$X \sim \text{Erlang}(n, \lambda)$
pmf / pdf	$p_X(a) = \begin{cases} \frac{e^{-\mu} \mu^a}{a!} & \text{if } a = 0, 1, 2, \dots \\ 0 & \text{o/w} \end{cases}$	$f_X(a) = \begin{cases} \lambda e^{-\lambda a} & \text{if } a \geq 0 \\ 0 & \text{o/w} \end{cases}$	$f_X(a) = \begin{cases} \frac{\lambda(\lambda a)^{n-1} e^{-\lambda a}}{(n-1)!} & \text{if } a \geq 0 \\ 0 & \text{o/w} \end{cases}$
cdf	$F_X(a) = \sum_{k=0}^{\lfloor a \rfloor} \frac{e^{-\mu} \mu^k}{k!}$	$F_X(a) = \begin{cases} 1 - e^{-\lambda a} & \text{if } a \geq 0 \\ 0 & \text{o/w} \end{cases}$	$F_X(a) = \begin{cases} 1 - \sum_{k=0}^{n-1} \frac{e^{-\lambda a} (\lambda a)^k}{k!} & \text{if } a \geq 0 \\ 0 & \text{o/w} \end{cases}$
expected value	$E[X] = \mu$	$E[X] = \frac{1}{\lambda}$	$E[X] = \frac{n}{\lambda}$
variance	$\text{Var}(x) = \mu$	$\text{Var}(X) = \frac{1}{\lambda^2}$	$\text{Var}(X) = \frac{n}{\lambda^2}$