Exponential Probability Formula & Memoryless Property

Problem Setup: Let us examine the times it takes call centre specialists to resolve incoming calls:

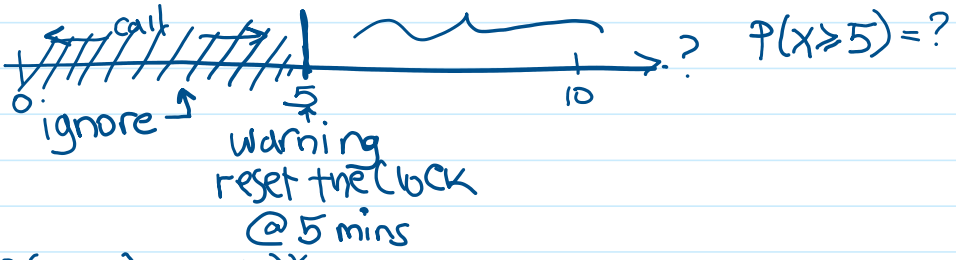
- The times follow an exponential distribution.
- It takes, on average, 2.5 minutes to resolve each call.
- After 5 minutes of being on a call, the specialist has a warning pop up on their screen urging them to wrap up the phone call.

Question: What is the probability, after receiving the warning, that it takes at least another 5 minutes to wrap up the call?

- time units = minutes
- λ (lambda) = average # / time unit

$$\lambda = \frac{1 \text{ call}}{2.5 \text{ minutes}} = \frac{1}{2.5} = 0.4 \ \frac{\text{calls}}{\text{minute}}$$

- x-range?



- $P(x \geq 5) \rightarrow P(x \geq X) = e^{-\lambda x}$

$$P(x \geq 5) = e^{-0.4(5)} = e^{-2} = 0.1353$$

13.53% chance that the call will last at least another 5 minutes