

$$\begin{aligned}
 & P(X > s+t \mid X > s) \\
 &= \frac{P(X > s+t, X > s)}{P(X > s)} = \frac{P(X > s+t)}{P(X > s)} = \frac{e^{-\lambda(s+t)}}{e^{-\lambda s}} \\
 &= e^{-\lambda t} = P(X > t)
 \end{aligned}$$

$$\begin{aligned}
 \text{For any } t > 0 : P(M \geq t) &= P(X_1 \geq t, X_2 \geq t, \dots, X_n \geq t) \\
 &= P(X_1 \geq t) P(X_2 \geq t) \dots P(X_n \geq t) = e^{-\lambda_1 t} \cdot e^{-\lambda_2 t} \dots e^{-\lambda_n t} \\
 &= e^{-(\lambda_1 + \lambda_2 + \dots + \lambda_n)t} \quad M \sim \text{EXPONENTIAL}(\lambda_1 + \lambda_2 + \dots + \lambda_n)
 \end{aligned}$$