Recitation 15 Solutions
April 7, 2005

1. The criminal will be caught if the first two officers both come by in fewer than t seconds. If X_1, X_2 are the respective interarrival times of the two officers, by the memoryless property of the exponential (recall that the interarrivals for a Poisson arrival process are exponentially distributed) we have:

$$\begin{aligned}\mathbf{P}(X_1 + X_2 \leq t) &= \int_0^t \int_0^{t-x_1} \left(\frac{\lambda}{60}\right)^2 e^{-\frac{\lambda}{60}(x_1+x_2)} dx_2 dx_1 \\ &= 1 - e^{-\frac{\lambda}{60}t}(\frac{\lambda}{60}t + 1).\end{aligned}$$

   (Note that the rate λ is given per minute, so the rate per second is $\lambda/60$.)

2. See online solutions.

3. See online solutions.