

3.128

Note that over a one-minute period, $Y = \#$ of cars that arrive at the toll booth is Poisson with $\lambda = 80/60 = 4/3$. Then, $P(Y \geq 1) = 1 - P(Y = 0) = 1 - e^{-4/3} = .7364$.

3.129

Following the above exercise, suppose the phone call is of length t , where t is in minutes. Then, $Y = \#$ of cars that arrive at the toll booth is Poisson with $\lambda = 4t/3$. Then, we must find the value of t such that

$$P(Y = 0) = 1 - e^{-4t/3} \geq .4.$$

Therefore, $t \leq -\frac{3}{4} \ln(.6) = .383$ minutes, or about $.383(60) = 23$ seconds.