STA312F07 Quiz 7

The Poisson distribution has probability mass function

$$p(y) = \frac{e^{-\lambda}\lambda^y}{y!},$$

where $\lambda > 0$ and y is a non-negative integer. You may use the fact that the MLE of λ is $\bar{y}$; you don't have to prove this.

Given two independent random samples, $X_1, \ldots, X_{n_1} \overset{i.i.d.}{\sim} \text{Poisson}(\lambda_1)$ and $Y_1, \ldots, Y_{n_2} \overset{i.i.d.}{\sim} \text{Poisson}(\lambda_2)$, we are interested in testing $H_0 : \lambda_1 = \lambda_2$.

1. What is Θ?
2. What is Θ_0?
3. Construct and *simplify* the large-sample likelihood ratio test statistic G.
4. Given $n_1 = 60$, $n_2 = 40$, $\bar{x} = 4.733$ and $\bar{y} = 9.35$, what is the value of G?

Total Marks = 10 points