Large-Sample Normal Approximation to the Posterior

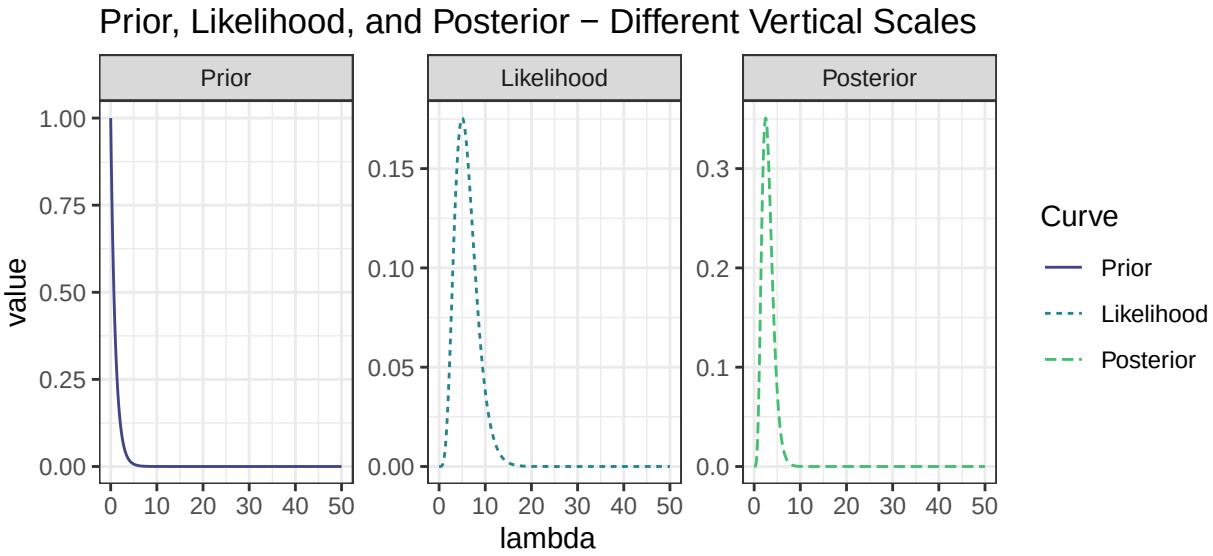
First Observaton: for large n, the prior doesn't matter

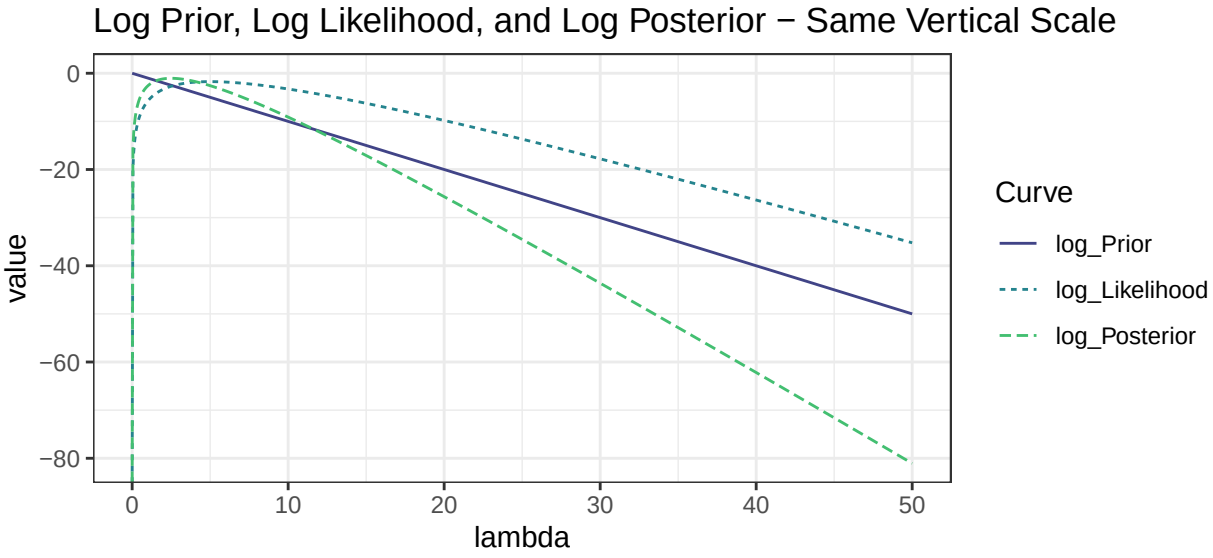
Poisson Model

- Observe $X_1, \ldots, X_n$; X_i is the number of seedlings in quadrat number i.
- Data Model: $X_i|\Lambda = \lambda \overset{\text{i.i.d.}}{\sim} \text{Poisson}(\lambda)$
- Suppose we use a Gamma prior for Λ
  - Example: $\Lambda \sim \text{Gamma}(1, 0.01)$ is fairly non-informative
- Think of the posterior pdf in terms of contributions from the prior and the likelihood

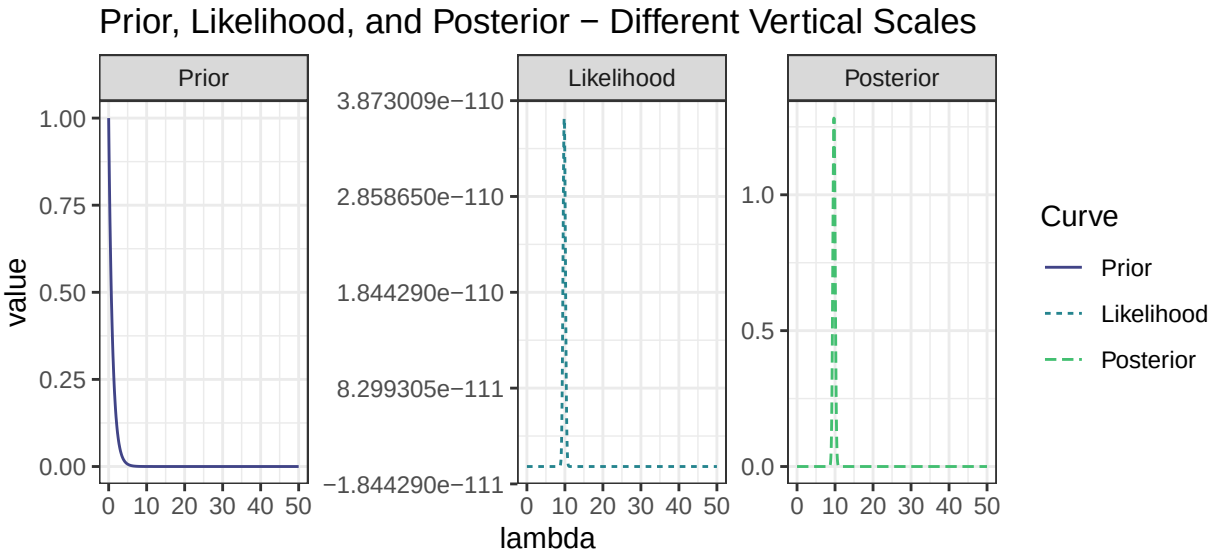
Simulation: Suppose $\lambda = 10$

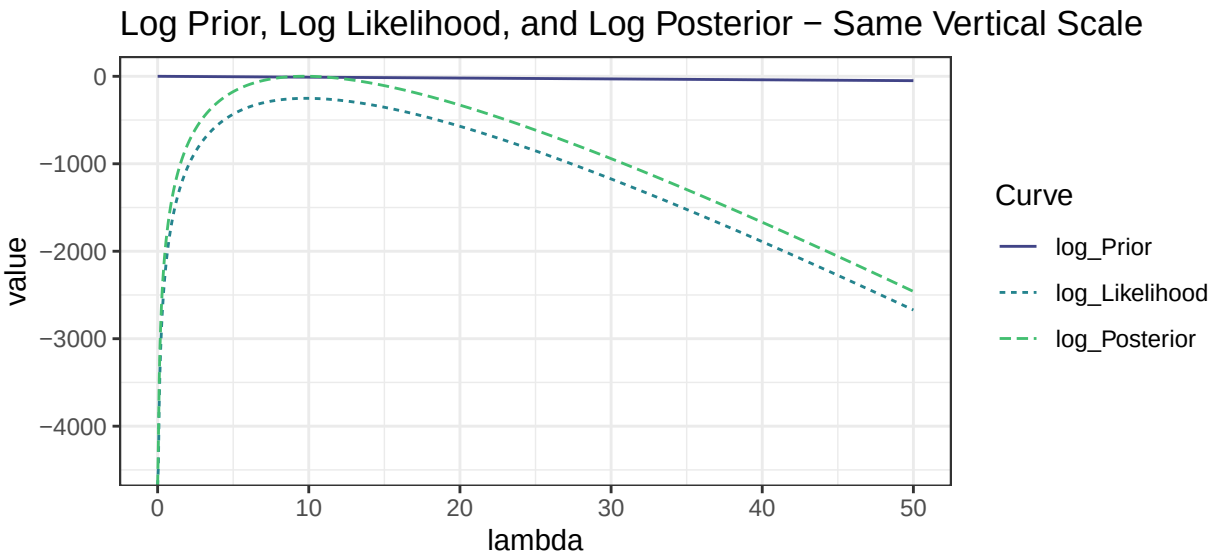
$n = 1$





$\mathbf{n = 100}$


Prior, Likelihood, and Posterior − Different Vertical Scales
Prior
Likelihood
Posterior
value
lambda
Curve
Prior
Likelihood
Posterior


Log Prior, Log Likelihood, and Log Posterior − Same Vertical Scale
value
lambda
Curve
log_Prior
log_Likelihood
log_Posterior