Text: Gelman’s *Bayesian Data Analysis*.

1. Text: Problem 2.19

   Part (a).

   Part (b).

   (c) Find the Bayes estimator when \( L(\sigma^2, a) = (\sigma^2 - a)^2 \).

   (d) Find the Bayes estimator when \( L(\sigma^2, a) = (\sigma^2 - a)^2/\sigma^2 \).

2. Text: Problem 3.10. Also, find a 100(1 - \( \alpha \))% credible interval for \( \sigma_1^2/\sigma_2^2 \).

3. Let \( y_1, \cdots, y_n \) be a random sample from exponential distribution with mean \( 1/\lambda \), where \( \lambda > 0 \) is unknown. Assume the Gamma \((a, b)\) prior.

   (a) Under the loss function, \( L_1(\lambda, a) = (a - \lambda)^2 \), find the Bayesian estimator.

   (a) Under the loss function, \( L_2(\lambda, a) = \left( \frac{a}{\lambda} - 1 \right)^2 \), find the Bayesian estimator.

   (a) Under the loss function, \( L_3(\lambda, a) = |a - \lambda| \), find the Bayesian estimator.