168. Consider $X_1, ..., X_n$ be IID from an exponential(λ) distribution where λ has the conjugate inverted gamma prior with parameters α and β, so that the prior PDF is

$$\pi(\lambda|\alpha,\beta) = \frac{1}{\Gamma(\alpha)\beta^\alpha}\left(\frac{1}{\lambda}\right)^{\alpha+1} e^{-1/(\beta\lambda)}, \quad 0 < \lambda < \infty.$$

In that, a $1-\alpha$ credible set was the set A satisfying

$$P(\lambda \in A|y) = \int_A \pi(\lambda|y)d\lambda.$$

Show how to find a $1-\alpha$ Bayes highest posterior density (HPD) credible set for λ.