

BY HENGJIAN CUI

Write (copy) the required excises, then give solutions by *yourself*.

Copy excises each other is NOT permitted!

EX13-1.

1. Let $X_1, X_2, \dots, X_n (n > 1)$ iid. $\sim N(\mu_0, \sigma^2)$ and $\theta = 1/\sigma^2$, where μ_0 is known.

- (1). Find the MLE $\hat{\theta}_M$ of θ .
- (2). Find the Fisher information $I(\theta)$.
- (3). Suppose $\theta \sim \Gamma(\alpha, \beta)$, find out the Bayesian estimation $\hat{\theta}_B$ of θ .
- (4). Is $\hat{\theta}_B$ consistent as $n \rightarrow \infty$? Why?
- (5). Are $\hat{\theta}_M$ and $\hat{\theta}_B$ asymptotic efficiency as $n \rightarrow \infty$? Why?