

考試科目 Course	數學統計學	開課系級 Dept, & Class	日期 Date, Period	月 第	日 節	試題編號 CourseNo.
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1. Let X_1, X_2, \dots, X_n be iid from $N(0, \sigma^2)$ σ known. For estimating θ under the squared error loss.
- (a) Is \bar{X} the Bayes solution with respect to a proper prior? Why?
- (b) Is \bar{X} minimax? Prove or disprove it.
- (c) Prove that \bar{X} is admissible.
- (d) Suppose that we know $\theta > \theta_0$. What can we say about the admissibility and minimaxity of \bar{X} ?

Note: State briefly the theorems or Lemmas you use in answering the questions.

2. Let X_1, X_2, \dots, X_n be a random sample from the exponential density $f(x; a, b) = a^{-1} e^{-(x-b)/a}$ $x \geq b$

- (a) For testing $b=0$, there exists UMPU test given by the acceptance region

$$0 \leq \frac{n \min(X_1, \dots, X_n)}{\sum [X_i - \min(X_1, \dots, X_n)]} \leq C$$

- (b) When $b=0$, the test statistic has probability density

$$p(u) = \frac{n-1}{(1+u)^n} \quad u \geq 0$$