Homework 4 - October 6, 2016. Questions.

Intermediate Statistics (Carnegie Mellon University)

Homework 4
36-705
Due: Thursday October 6 by 3:00

1. Let $X_1, \ldots, X_n \sim N(\mu, \Sigma)$ where $X_i \in \mathbb{R}^d$, $\mu \in \mathbb{R}^d$ and Σ is $d \times d$.
   (a) Find a minimal sufficient statistic.
   (b) Show that $X_1 + X_2$ is not a sufficient statistic.
2. Let $X_1, X_2 \sim \text{Uniform}(0, \theta)$ where $\theta > 0$.
   (a) Find the distribution of (X_1, X_2) given T where $T = \max\{X_1, X_2\}$.
   (b) Show that $X_1 + X_2$ is not sufficient.
3. Let $X_1, \ldots, X_n \sim \text{Uniform}(-\theta, 2\theta)$ where $\theta > 0$. Find the likelihood function.
4. Chapter 6, problem 1.
5. Chapter 6, problem 3.
6. Chapter 9, Problem 2 (a,b,c).