HOMEWORK 9, STAT 6332

1. Consider a Binomial random variable $X$ with $n = 15$ and the probability of success $p$. Find the UMP test for testing $H_0 : (p \leq .2) \cup (p \geq .7)$ versus $H_a : .2 < p < .7$ when $\alpha = .1$.

2. Suppose that we have a sample of size $n$ from $Unif(0, \theta)$. Determine (when it is possible) the UMP test with level of significance $\alpha$:
   (i) $H_0 : \theta = \theta_0$ versus $H_a : \theta > \theta_0$.
   (ii) $H_0 : \theta = \theta_0$ versus $H_a : \theta < \theta_0$.
   (iii) $H_0 : \theta = \theta_0$ versus $H_a : \theta \neq \theta_0$.
   (iv) $H_0 : \theta < \theta_1$ or $\theta > \theta_2$ versus $H_a : \theta \in [\theta_1, \theta_2]$.

3. Consider a sample from $X = \theta + \xi$ where $xi$ is $Exponential(1)$. Solve the same problems as in Problem 2.