Homework 6 - October 27, 2016. Questions.

Intermediate Statistics (Carnegie Mellon University)

Homework 6
36-705
Due: Thursday October 27 by 3:00

1. Chapter 10, problem 2.

2. Let $X_1, \ldots, X_n \sim \text{Exponential}(\theta)$. Thus

$$p(x;\theta) = \theta e^{-x\theta} \quad \text{for } x > 0.$$

We want to test:

$$H_0 : \theta = 1 \quad \text{versus} \quad \theta > 1.$$

Consider the following test: reject H_0 if $\widehat{\theta}_n > c$ where $\widehat{\theta}_n$ is the mle.

(a) Find c so that the test has level α.

(b) Find the power function.

3. Chapter 10, problem 9.

4. Chapter 10, problem 14. (You can use asymptotic approximations.)

5. Let $X_1, \ldots, X_n \sim N(\theta, 1)$. Consider testing:

$$H_0 : \ \theta \leq 1 \qquad \text{versus} \qquad H_1 : \theta > 1.$$

Suppose we reject H_0 when $\overline{X}_n > c$. Find c so that the test has size α. Find the power function.