36 - 226 Introduction to Statistical Inference

Homework assignment 12

Due: Wednesday, April 17, 2013

- Write your full name, the course number, and the homework number at the top of each page.
- **STAPLE** your entire assignment together with a staple.
- Write clearly. Electronic submission of homework assignments is not accepted.

1. Wackerly 10.94.

2. Wackerly 10.95.

3. Wackerly 10.96.

4. Wackerly 10.100.

5. Wackerly 10.102.

6. Suppose $Y_1, \ldots, Y_n$ are i.i.d. from $f_y(y) = \theta y^{\theta-1}$, where $\theta > 0$ and $0 < y < 1$.

   (a) Show that $-\log(Y) \sim Exp(1/\theta)$. *Hint: Consider the method of distribution functions.*

   (b) Show that $-2\theta \sum_{i=1}^{n} \log(Y_i) \sim \chi^2_{2n}$. *Hint: Consider the method of moment-generating functions.*

   (c) Find the MP test for $H_0 : \theta = 2$ $H_a : \theta = \theta_a$, $\theta_a < \theta_0$, at $\alpha = .05$ if $n = 10$.

7. Wackerly 11.1.