STAT 341 - Worksheet
2/01/2019

Your Name (scribe): _____

Partner Name(s): _____

1. Let $Y_1, Y_2, ..., Y_n$ be a random sample of size n from the pdf $f_Y(y;\theta) = \frac{2y}{\theta^2}, 0 \le y \le \theta$.

   a. Find a formula for the method of moments estimate for θ .

   b. Compare the variance of this estimator to the Cramer-Rao lower bound (use square of first derivative to calculate the CR lower bound).

   c. Is your result in b a contradiction to the Cramer-Rao theorem? Why or why not?

2. An owner of a car wash wants to know how many cars are coming in at a particular slow time of day, 9am-10am Sun-Fri. For a week, she records the number of cars to be 3, 0, 5, 1, 2, and 1. Assume that number of car washes at this time are Poisson with some rate λ and each day is independent of days before it.

    a. What is the population? What is the parameter?

    b. What variable are we measuring? What is the sample?

    c. Derive the method of moments estimators to estimate the rate of car washes during this slow time. Estimate λ using this estimator and the data provided.

    d. Can you come up with another estimator for λ?