

Instructions: Answer each question as thoroughly as possible. Round answers to 4 decimal places as needed. Exact answers are best when possible. Be sure to answer all parts of each question.

1. A weather researcher measured the temperature everyday in the month of July one year and found a mean high temperature of 91.7 in a particular city with a standard deviation of 5.6 degrees. Construct an 80% confidence interval for the mean high temperature in July in the same city for any year. (July has 31 days.)
2. A poll is conducted and found that among 850 survey takers, 10% of respondents did not identify as right-handed. Construct a 95% confidence interval for the proportion of the population that is not right-handed.
3. Explain why a confidence interval is preferred over a point estimate.
4. An exponential distribution has a mean of $E(X) = \frac{1}{\lambda}$. Data from an exponential distribution is collected: {3.12, 5.17, 12.06, 18.72, 11.35, 8.04, 4.53, 21.07, 6.61}. Use the maximum likelihood function to estimate the parameter λ .