Name: ______________________________

Please submit the answers to the following questions using R. Upload a file with your R commands to CCLE.

Note: Probabilities or percentiles of distributions must be computed using the functions `pnorm`, `qnorm`, etc.

1. Suppose $X \sim N(50, 5)$. Find $P(60 < X < 65)$.

2. Suppose $X_1, X_2, \ldots, X_{50}$ denotes a random sample from $N(100, 10)$. Find $P\left(\frac{49S^2}{100} > 61\right)$. ($S^2$ is the sample variance).

3. Find the 13th percentile of $N(50, 5)$.

4. The number of patients arrive at a clinic follows the Poisson distribution with parameter $\lambda = 20$ per hour. Find the probability that in the next hour we observe more than 25 patients.

5. Access the data:

   ```
   a <- read.table("http://www.stat.ucla.edu/~nchristo/statistics13/jura.txt", header=TRUE)
   ```

   Create a new data set with the following variables: $x$, $y$, $Cd$, $Ni$, $Cr$.

6. In a hypothesis testing for the mean with unknown standard deviation it was found that $t = 1.15$. The sample size was $n = 46$ and the hypothesis to test was $H_0 : \mu = 50$
   $H_a : \mu > 50$

   Find the p-value for this test.

7. Use the data in question 5. Consider the variable $Cd$. Do the following: (a). Compute the summary statistics. (b). Construct its histogram and boxplot. (c). Construct a bubble plot.

8. Consider the data in question 5. Run the regression of $Cd$ on $Cr$, plot $Cd$ against $Cr$, and fit the regression line through the scatterplot.

9. Consider the data in question 5. Construct the distribution of the sample mean when repeated samples of size $n = 100$ are selected from the variable $Cd$. Use 10000 samples.

10. Suppose you roll two dice 20 times. Find the probability of obtaining at most 5 sums of 7.