STA 2023   REVIEW III

1. True/False

_____ The width of a confidence interval increases as the sample size decreases, everything else held constant.

_____ It is desirable for the width of a confidence interval to be large.

_____ A type I error is committed whenever the null hypothesis is incorrectly rejected.

_____ For an upper-tailed hypothesis test, if the critical value of z is 2.33 and the test statistic is 2.57, the null hypothesis should be accepted.

2. If a 90% confidence interval for p is (.35, .45), what is meant by "90% confidence"?

3. In a random sample of 150 clerical workers, 30 exhibit an intense dislike for their jobs. Calculate a 94% confidence interval for the proportion of clerical workers who exhibit an intense dislike for their jobs.

4. A telephone answering service records the length of each call. A random sample of 12 reports yields a mean length of 3.2 minutes with a standard deviation of .7 minute. Calculate a 95% confidence interval for the mean length of phone calls for this answering service.

5. A market research firm wishes to determine the mean number of hours families in a particular community watch television per week. A random sample of 300 families results in a mean viewing time of 26.8 hours with a standard deviation of 7.3. Do you have enough evidence to conclude the mean viewing time in this community exceeds 25 hours? Use $\alpha = .07$.

6. Define a Type I and Type II error in terms of problem # 5.

7. In a random sample of 200 college students, 45 had taken Statistics in high school. Using $\alpha = .04$, do you have enough evidence to conclude the proportion of college students who have not taken Statistics in high school differs from .75?

8. Find the p-value for problem #7.

KEY

1. T, F, T, F
2. In repeated sampling, 90% of the intervals constructed will contain p.
3. (.139, .261)
4. (2.76, 3.64)
5. z = 4.27, yes
6. Type I: Conclude the mean viewing time per family in this community is greater than 25 hours when in fact it is less than or equal to 25 hours.

   Type II: Conclude the mean viewing time per family in this community is equal to (or less than) 25 hours when in fact it is greater than 25 hours.
7. z = .82, no
8. .4122