

Name_____

SHORT ANSWER. Write your answer in the space provided or on a separate sheet of paper.

Provide an appropriate response.

1) Explain the difference between descriptive and inferential statistics.

2) Define a point estimate. What is the best point estimate for μ ?

3) When determining the sample size needed to achieve a particular error estimate you need to know σ .
What are two methods of estimating σ if σ is unknown?

4) Under what circumstances can you replace σ with s in the formula $E = z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}}$.

5) When determining sample size we need to know \hat{p} . If we have no prior information, what are two methods that can be used?

6) What is the best point estimate for the population proportion? Explain why that point estimate is best.

7) Under what three conditions is it appropriate to use the t distribution in place of the standard normal distribution?

Use the given data to find the minimum sample size required to estimate the population proportion.

8) Margin of error: 0.09; confidence level: 99%; \hat{p} and \hat{q} unknown

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p .

9) When 334 college students are randomly selected and surveyed, it is found that 103 own a car. Find a 99% confidence interval for the true proportion of all college students who own a car.

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ . Assume that the population has a normal distribution.

10) A sociologist develops a test to measure attitudes towards public transportation, and 27 randomly selected subjects are given the test. Their mean score is 76.2 and their standard deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects.

Use the given information to find the minimum sample size required to estimate an unknown population mean μ .

11) How many weeks of data must be randomly sampled to estimate the mean weekly sales of a new line of athletic footwear? We want 99% confidence that the sample mean is within \$200 of the population mean, and the population standard deviation is known to be \$1400.

Use the confidence level and sample data to find a confidence interval for estimating the population μ . Round your answer to the same number of decimal places as the sample mean.

12) A random sample of 108 light bulbs had a mean life of $\bar{x} = 547$ hours with a standard deviation of $\sigma = 36$ hours. Construct a 90% confidence interval for the mean life, μ , of all light bulbs of this type.

Answer Key

Testname: DISCUSSION 4

- 1) Descriptive statistics summarizes or describes important characteristics of known population data. Inferential statistics uses sample data to make inferences or generalizations about a population.
- 2) A point estimate is a single value used to approximate a population parameter. The sample mean \bar{x} is the best point estimate of μ .
- 3) 1) Use the range rule of thumb.
2) Conduct a pilot study and base your estimate of σ on the first collection of at least 31 randomly selected values.
- 4) Provided $n > 30$, s can be used in place of σ . If $n \leq 30$, the population must be normal and σ must be known to use the formula.
- 5) Use a result from a prior study or use $\hat{p} = 0.5$.
- 6) The sample proportion \hat{p} .
 - 1) \hat{p} is unbiased (does not consistently overestimate or underestimate p).
 - 2) \hat{p} is most consistent (has the least variation of all the measures of central tendency).
- 7) 1) $n \leq 30$
2) σ is unknown, and
3) the parent population is essentially normal
- 8) 205
- 9) $0.243 < p < 0.373$
- 10) $67.7 < \mu < 84.7$
- 11) 325
- 12) $541 \text{ hr} < \mu < 553 \text{ hr}$