Chapter 8: Estimating Single Population Parameters

Multiple Choice

This activity contains 11 questions.

1. **A single number determined from a sample that is used to estimate the corresponding population parameter is called a**

[Hint]

- point estimate.
- sample point.
- sample space.
- statistic.

2. **The difference between a value (a statistic) computed from a sample and the corresponding value (a parameter) computed from the population is known as**

[Hint]

- point estimate.
- confidence interval.
- confidence level.
- sampling error.

3. **The average amount of cola in a sample of 80 bottles was 101.2 mL. An earlier study suggested that the standard deviation of the bottles is 1.4 mL. Determine the 95% confidence interval for the estimate of the population mean.**

[Hint]

- (100.943, 101.457)
- (100.893, 101.507)
- (100.836, 101.564)
- (100.679, 101.721)

4. **The percentage of all possible confidence intervals that will contain the true population parameter is known as**

[Hint]

- margin of error.
- a point estimate.
- a confidence level.
- sampling error.

5. **Which of the following is <u>not</u> a way to reduce the margin of error?**

[Hint]

- Decrease the sample size.
- Increase the sample size.
- Reduce the confidence level.
- Reduce the standard deviation.

6. **Develop a 95% confidence interval for the mean when the sample mean is 90.3, the sample standard deviation is 11.6, and the sample size is 25. Assume the population is normally distributed.**

[Hint]

- (87.980, 92.620)
- (86.484, 94.116)
- (85.512, 95.088)
- (84.964, 95.636)

7. [Hint] **Which of the following is not one of the conditions necessary to use $\bar{x} \pm t \frac{s}{\sqrt{n}}$ to find the confidence interval?**

- μ is known.
- the distribution is approximately normal.
- σ is not known.
- $n < 30$.

8. [Hint] **A consumer group wishes to estimate the average electric bills for the month of July for single-family homes in a large city. Based on studies conducted in other cities, the population standard deviation is $25. The group wants to estimate the average bill for July to within $5 of the true average with 90% confidence. What sample size is needed?**

- 52
- 68
- 75
- 82

9. [Hint] **Which of the following is not an approach for determining a sample size when σ is not known?**

- Use a value for σ which is at least as large as the true σ.
- Use the value of σ associated with $n = 30$.
- Estimate σ from a pilot sample.
- Estimate σ by dividing the range by 6.

10. [Hint] **A researcher found that 62 of the 85 people randomly selected were in favor of reducing the sales tax. Compute the 90% confidence interval estimate for п.**

- (0.635, 0.823)
- (0.650, 0.808)
- (0.615, 0.843)
- (0.606, 0.852)

11. **A researcher did a pilot sample of 25 individuals and found *p* to be 0.20. How many <u>more</u> must he survey to develop a 95% confidence interval that has a 0.03 margin of error?**

[Hint]

- 643
- 647
- 651
-

True or False

This activity contains 10 questions.

1. **The margin of error is increased if the confidence level is increased.**

[Hint]

- True
- False

2. **All confidence interval estimations require that the population of interest follows the normal probability distribution.**

[Hint]

- True
- False

3. **The confidence interval estimate of the population mean is constructed around the sample mean.**

[Hint]

- True
- False

4. **For a sample size greater than 30, we can expect that 95% of all sample means will fall within the range**

[Hint]

$$\mu - 1.645\frac{\sigma}{\sqrt{n}} \text{ ------ } \mu + 1.645\frac{\sigma}{\sqrt{n}}.$$

- True
- False

5. **As the degrees of freedom increase, *t*-values decrease and approach a limit of 0.**

[Hint]

- True
- False

6. **If one needs to estimate the population mean with a sample size exceeding 30, a conventional option is to find the critical value in the *z*-table then use the equation $\bar{x} \pm z \frac{s}{\sqrt{n}}$ to develop the interval estimate.**

[Hint]

- True
- False

7. **If the population standard deviation is unknown when we are trying to determine the required sample size for estimating the population mean, we can collect a pilot sample from the population to estimate the population standard deviation.**

[Hint]

- True
- False

8. **To determine the sample size required to estimate a proportion within a given margin of error, the value for *p* that will give the largest sample is 0.5.**

[Hint]

- True
- False

9. **The confidence interval obtained might not correctly estimate the population parameter.**

[Hint]

- True
- False

10. **A 95% confidence interval was calculated from a sample of 100 commuters to estimate the average number of miles a person drives to work each day and was found to be 10.2 --------- 16.5 miles. Based on this information, we can conclude that there is a 95% probability that the true population mean for people commuting to work is between 10.2 and 16.5 miles.**

[Hint]

- True
- False