Sample Size & Assumptions

Latest Submission Grade 100%

1. A poll was done at a public University asking undergraduate students whether they are an in state student or out of state student. A sample of 232 undergraduate students at the University were asked and it was revealed that 43% of students were from out of state. From the results, a 95% confidence interval was calculated to be (0.3663, 0.4937). **1 / 1 point**

Which of the following corresponds to the value of 43%? (Select all that apply)

- [x] Statistic

  Correct
  Correct.

- [ ] Parameter

- [x] Sample proportion

  Correct
  Correct.

- [ ] Population proportion

- [x] Estimate of the population proportion

  Correct
  Correct.

- [ ] Test statistic

2. **In order to make the above confidence interval researchers first had to check their assumptions. Select all the appropriate assumptions that are needed to create a one population proportion confidence interval.** **1 / 1 point**

- [ ] The population proportion comes from data that is considered a simple random sample
- [x] The sample proportion comes from data that is considered a simple random sample

Correct
Correct.

- [x] The number of respondents who replied "out of state" must be at least 10

Correct
Correct.

- [x] The number of respondents who replied "in state" must be at least 10

Correct
Correct.

- [ ] The distribution of our population proportion must be normally distributed

3. **1 / 1 point**

What is the margin of error for the given 95% confidence interval above?

- ○ 1.96
- ○ 0.00106

- ○ 0.0325
- ◉ 0.0637
- ○ 0.1274

✓ **Correct**

4. A larger sample was taken and the same sample proportion was found. How would the width of the 95% confidence interval change from our initial interval? **1 / 1 point**

- ○ Widen
- ◉ Shorten
- ○ Stay the same
- ○ Unable to tell

✓ **Correct**

5. If the researcher would like to have their confidence interval be narrower, more precise, which of the following would achieve this? **1 / 1 point**

- ◉ Change the confidence level to 90%
- ○ Change the confidence level to 99%
- ○ Calculate a conservative 95% confidence interval

✓ **Correct**

6. **What minimum sample size does the researcher need in order to create a 95% conservative confidence interval with a margin of error of no more than 4%?** **1 / 1 point**

- ○ 24.5
- ○ 25
- ○ 600
- ○ 600.25
- ◉ 601

✓ **Correct**

7. **What minimum sample size does the researcher need in order to create a 98% conservative confidence interval with a margin of error of no more than 3%?** **1 / 1 point**

- ○ 1067.11
- ○ 1068
- ○ 1502.85
- ◉ 1503

✓ **Correct**

8. **Which of the following would be considered an appropriate interpretation of the given 95% confidence interval?** **1 / 1 point**

- ○ We estimate, with 95% confidence that the sample proportion of out of state undergraduate students at this University is between (0.3663, 0.4937)
- ◉ We are 95% confident that the population proportion of out of state undergraduate students at this University is between 36.63% and 49.37%
- ○ There is a 95% chance that the population proportion of out of state undergraduate students at this University is between 36.63% and 49.37%
- ○ If we repeated this study many times we would expect to obtain the true population proportion of out of state undergraduate students at this University 95% of the time in the resulting confidence interval of (0.3663, 0.4937)

✓ **Correct**

9. Which of the following best describes the confidence level in the context of the problem? **1 / 1 point**

- ○ If we repeated this study many times, each time producing a new sample (of the same size) from which a 95% confidence interval is computed, then we would expect the population proportion of out of state undergraduate students at this University to be contained within the (0.3663, 0.4937) interval 95% of the time.
- ○ If we repeated a similar study many times, each time producing a new sample (of various sizes) from which a 95% confidence interval is computed, then 95% of the resulting confidence intervals would be expected to contain the population proportion of out of state undergraduate students at this University.
- ○ If we repeated this study many times, each time producing a new sample (of the same size) from which a 95% confidence interval is computed, then 95% of the resulting confidence intervals would be expected to contain the sample proportion of out of state undergraduate students at this University.
- ◉ If we repeated this study many times, each time producing a new sample (of the same size) from which a 95% confidence interval is computed, then 95% of the resulting confidence intervals would be expected to contain the population proportion of out of state undergraduate students at this University.

Correct

10. **Based on the reported 95% confidence interval (and no additional calculations), does it appear there is a minority of undergraduate students at the University that are from out of state?** **1 / 1 point**

- ○ Yes, because 43% is below 50%
- ○ No, because our sample size is not large enough
- ○ No, because the entire interval is below 50%
- ◉ Yes, because the entire interval is below 50%
- ○ Unable to tell

Correct