

Review Questions for Inference About two Populations

You are asked to check whether the popularity of a candidate increased after a sequence of television ads. Before the ads were shown on TV you asked a sample of 750 adults about the candidate of their choice and 315 preferred your candidate. After the broadcast you interviewed 650 adults and 312 favored your candidate. Answer the following seven questions based on this information.

1. Find the upper limit of the 90% confidence interval for the proportion increase after the ads.
a. 0.094 *b. 0.104 c. 0.112 d. 0.124 e. none of the above
2. Find the lower limit of the 90% confidence interval for the proportion increase after the ads.
a. 0.026 *b. 0.016 c. 0.008 d. -0.004 e. none of the above

You are asked to check whether the proportion of support for your candidate increased after the ads were aired with 90% confidence.

3. Find the statistic:
a. 1.932 b. 2.168 *c. 2.254 d. 2.573 e. none of the above
4. Find the critical value:
*a. 1.282 b. 1.645 c. 1.960 d. 2.326 e. none of the above
5. Can you say with 90% confidence that the proportion of support for your candidate increased after the ads were aired?
*a. Yes b. No c. Inconclusive d. None of the above
6. What is the significance (p-value) of the test?
*a. 0.0122 b. 0.0244 c. 0.0488 d. cannot be accurately determined by the tables in the book
e. none of the above

You instituted new auditing procedures in your company. Before the new procedure you sampled 260 forms and found 13 of them to contain inaccuracies. After the new auditing procedures were instituted you sampled 260 forms and found that 26 of them contain inaccuracies. You are asked to check whether the proportion of found inaccuracies now (p_2) is higher than the proportion of found inaccuracies before the new procedures were instituted (p_1) with 95% confidence.

7. Find the statistic:
a. 1.02 b. *2.16 c. 1.13 d. 2.62 e. none of the above
8. Find the critical value:
*a. 1.645 b. 1.960 c. 2.326 d. 2.576 e. none of the above
9. Can you say with 95% confidence that proportion now is greater than before?
*a. Yes b. No c. Inconclusive d. None of the above

10. What is the significance (p-value) of the test?
a. 0.0076 *b. 0.0154 c. 0.0308 d. cannot be determined accurately by the tables in the book
e. none of the above

You are asked to check whether home prices in two neighborhoods are significantly different. You selected 3 homes in the first neighborhood and 5 homes in the second neighborhood all with the same number of bedrooms, the same square footage, so that they can be considered equivalent. The mean price in the first neighborhood (in thousands of dollars) was 217 with a standard deviation of 20 and the mean price in the second neighborhood was 234 with a standard deviation of 17. Answer the following seven questions based on this information.

11. Find the upper limit of the 99% confidence interval for the difference in the prices between the two neighborhoods (subtract the price for the first neighborhood from the second one).
a. 47.7 b. 51.0 c. 58.4 *d. 65.9 e. none of the above
12. Find the lower limit of the 99% confidence interval for the difference in the prices between the two neighborhoods (subtract the price for first neighborhood from the second one).
a. -13.7 b. -17.0 c. -24.4 *d. -31.9 e. none of the above

You are asked to check whether home prices in the two neighborhoods are different with 90% confidence.

13. Find the statistic:
*a. 1.29 b. 1.68 c. 1.97 d. 2.23 e. none of the above
14. Find the critical value:
a. 1.645 b. 1.440 c. 1.282 *d. 1.943 e. none of the above
15. Can you say with 90% confidence that home prices in the two neighborhoods are different?
a. Yes *b. No c. Inconclusive d. None of the above
16. What is the significance (p-value) of the test?
a. 0.0239 b. 0.0478 c. 0.0596 *d. cannot be determined accurately by the tables in the book
e. none of the above

You made a change in your production process. Before the change you checked the production rate for 8 days and found an average of 347.2 products per day with a standard deviation of 45.8. After the change you checked the production rate for 10 days and found an average of 386.2 products per day with a standard deviation of 32.7. Answer the following five questions based on this information.

17. Find the upper limit of the 99% confidence interval for the difference in daily production rates after the change minus before the change.
a. 68.0 b. 85.6 c. 78.2 *d. 93.0 e. none of the above

You are asked to check whether the production rate after the change is higher than the production rate before the change with 95% confidence.

18. Find the statistic:
a. 2.26 b. 2.35 *c. 2.11 d. 2.23 e. none of the above
19. Find the critical value:
a. 1.645 *b. 1.746 c. 2.120 d. 1.960 e. none of the above
20. Can you say with 95% confidence that production rate increased after the change?
*a. Yes b. No c. Inconclusive d. None of the above
21. What is the significance (p-value) of the test?
a. 0.0146 b. 0.0292 c. 0.0584 *d. cannot be determined accurately by the tables in the book
e. none of the above

You conducted an advertisement campaign of your product. Before the ad campaign you interviewed 800 shoppers and 320 of them bought your product. After the campaign you interviewed 1200 shoppers and 540 bought your product. You are asked to find with 90% confidence whether there was a change in shoppers behavior following the ad campaign. Answer the following five questions based on this information.

22. Find the upper limit of the 90% confidence interval for the difference in the proportion of shoppers after and before the ad campaign(subtract the proportion after from the proportion before).
a. 0.079 b. 0.081 *c. 0.087 d. 0.089 e. none of the above

You are asked to check whether shopping behavior changed following the ad campaign with 90% confidence.

23. Find the statistic:
a. 1.873 *b. 2.213 c. 2.354 d. 2.576 e. none of the above
24. Find the critical value:
*a. 1.645 b. 1.282 c. 1.960 d. 2.110 e. none of the above
25. Can you say with 90% confidence that shopping behavior changed following the ad campaign?
*a. Yes b. No c. Inconclusive d. None of the above
26. What is the significance (p-value) of the test?
a. 0.0136 *b. 0.0272 c. 0.0544 d. cannot be determined accurately by the tables in the book
e. none of the above

For many years the standard deviation of students grades was 0.43 and you have no reason to believe that it has changed. You have two classes one with 12

students whose GPA was 2.57 and another class of 14 students whose GPA was 2.71. Answer the following five questions based on this information. You are asked to check whether the two classes have a different GPA with 95% confidence.

27. Find the statistic:
*a. 0.83 b. 0.95 c. 1.13 d. 1.43 e. none of the above
28. Find the critical value:
a. 1.711 b. 1.645 *c. 1.960 d. 2.064 e. none of the above
29. Can you say with 90% confidence that the proportion of support for your candidate increased after the ads were aired?
a. Yes *b. No c. Inconclusive d. None of the above
30. What is the significance (p-value) of the test?
a. 0.2033 b. 0.3196 *c. 0.4066 d. cannot be accurately determined by the tables in the book
e. none of the above