Section D: Extending Your Comprehension
(Answers below)

20. A politician has voted against abortion rights in the past but decides to change his voting pattern if significantly more than half the voters in his district are pro-choice. He takes a random sample of 100 voters and finds that 59 of these 100 are pro-choice. Should he change his voting pattern? [Hint: This requires a little thought. Use the general formula for the test statistic; the sample statistic is \( p \), the sample proportion. The standard error of a proportion was derived at the end of Chapter 8.]

21. Assume that the null hypothesis is \( \mu = 10 \) and that \( \sigma \) is unknown. Create a data set that has five points such that we reject the null hypothesis if \( \alpha = .05 \) but fail to reject it if \( \alpha = .01 \).

22. Is it possible to create a data set where we reject \( H_0 \) using \( \alpha = .01 \) but fail to reject it when \( \alpha = .05 \)? Explain.

23. Assume that the null hypothesis is \( \mu = 10 \) and that \( \sigma \) is unknown. Create a data set that has five points such that we reject the null hypothesis if the test is directional but fail to reject it if the test is nondirectional.

24. Is it possible to create a data set where we reject \( H_0 \) if the test is nondirectional but fail to reject it if the test is directional? Explain.

Section E: Computer Explorations

25. Have the computer take a random sample of size \( n = 5 \) from the population of IQ scores (\( \mu = 100, \sigma = 15 \)). Then test the nondirectional null hypothesis \( H_0: \mu = 96 \). Did you reject \( H_0 \)? Was it a “close call” or was the decision clear?

26. (Exercise 25 continued) Repeat the procedure of Exercise 25, except let \( n = 200 \). Now did you reject \( H_0: \mu = 96 \)? Was it a “close call” or was the decision clear?

27. Explain the similarities and differences between your results in Exercises 25 and 26.

28. (a) Have the computer take a random sample of size \( n = 10 \) from the population of IQ scores (\( \mu = 100, \sigma = 15 \)).

(b) Add 20 points to each score in the sample (use \textit{Edit Variable} in DataGen or \textit{Transform} in SPSS).

(c) Test the nondirectional null hypothesis \( H_0: \mu = 100 \).

(d) What constant must be added to or subtracted from all these values so that the null hypothesis is just barely rejected? [Hint: Think about the confidence interval.]
Answers to Selected Additional Exercises for Chapter 10

Section D: Extending Comprehension

20. Yes; he should change; $s_p = 0.0494$, $t_{obs} = 1.821$, $t_{cv} = 1.666$ (directional)

21. Hint: Choose any five-point data set. How does $s$ change if you add (or subtract) the same constant to each of the five points? How does the numerator of $t$ change under the same alterations? How does $s$ change if you add a constant to the highest value and subtract the same constant from the lowest value? How does the numerator of $t$ change under the same alterations?

22. No; it is impossible. Crossing the higher hurdle implies crossing the lower hurdle.

23. See the hint for Exercise 21.

24. Yes; only if the observed value is in the opposite tail from the critical value of the directional test.