5. Listed below are the costs (in dollars) of repairing the front ends and rear ends of different cars when they were damaged in controlled low-speed crash tests (based on data from the Insurance Institute for Highway Safety). The cars are Toyota, Mazda, Volvo, Saturn, Subaru, Hyundai, Honda, Volkswagen, and Nissan. Are the data independent or dependent?

Front repair cost	936	978	2252	1032	3911	4312	3469	2598	4535
Rear repair cost	1480	1202	802	3191	1122	739	2769	3375	1787

6. Refer to the sample data given in Exercise 5 and identify the null and alternative hypotheses resulting from the claim that the mean of the differences is greater than zero so that front repair costs are greater than the corresponding rear repair costs. Express those hypotheses in symbolic form.

7. When testing the hypotheses from Exercise 6, we get the test statistic $t = 1.302$ and the P-value of 0.2293. What should we conclude?

8. Which distribution is used to test the claim that the standard deviation of the ages of California voters is equal to the standard deviation of voters in Texas (normal, t, chi-square, F, binomial)?

9. Determine whether the following statement is true or false: When testing the claim that the mean annual income of statistics professors in New York is equal to the mean annual income of statistics professors in Illinois, either the two population standard deviations must be known or both samples must include more than 30 values.

10. Determine whether the following statement is true or false: When using the methods of this chapter to test a claim that two population proportions are equal, each of the two samples must satisfy the requirement that $np \geq 5$ and $nq \geq 5$.

Review Exercises

1. Carpal Tunnel Syndrome Carpal tunnel syndrome is a common wrist complaint resulting from a compressed nerve, and it is often caused by repetitive wrist movements. In a randomized controlled trial, among 73 patients treated with surgery and evaluated one year later, 67 were found to have successful treatments. Among 83 patients treated with splints and evaluated one year later, 60 were found to have successful treatments (based on data from "Splinting vs Surgery in the Treatment of Carpal Tunnel Syndrome," by Gerritsen, et al., *Journal of the American Medical Association,* Vol. 288, No. 10). In a journal article about the trial, authors claimed that "treatment with open carpal tunnel release surgery resulted in better outcomes than treatment with wrist splinting for patients with CTS (carpal tunnel syndrome)." Use a 0.01 significance level to test the stated claim. What treatment strategy is suggested by the results?

2. Carpal Tunnel Syndrome Construct a confidence interval suitable for testing the claim from Exercise 1. What feature of the resulting confidence interval leads to the same conclusion from Exercise 1?

3. Airbags Save Lives In a study of the effectiveness of airbags in cars, 11,541 occupants were observed in car crashes with airbags available, and 41 of them were fatalities. Among 9853 occupants in crashes with airbags not available, 52 were fatalities (based on data from "Who Wants Airbags?" by Meyer and Finney, *Chance*, Vol. 18, No. 2). Use a 0.05 significance level to test the claim that the fatality rate of occupants is lower for those in cars equipped with airbags.

4. Are Flights Cheaper When Scheduled Earlier? Listed below are the costs (in dollars) of flights from New York (JFK) to San Francisco for US Air, Continental, Delta, United,