7.12 You will have complete sales information for last month in a week, but right now you have data from a random sample of 40 stores. The mean change in sales in the sample is +3.8% and the standard deviation of the changes is 12%. Are average sales for all stores different from last month?
(a) State appropriate null and alternative hypotheses. Explain how you decided between the one- and two-sided alternatives.
(b) Find the $t$ statistic and its $P$-value. State your conclusion.
(c) If the test gives strong evidence against the null hypothesis, would you conclude that sales are up in every one of your stores? Explain your answer.

7.33 A bank wonders whether omitting the annual credit card fee for customers who charge at least $3000 in a year would increase the amount charged on its credit card. The bank makes this offer to an SRS of 500 of its existing credit card customers. It then compares how much these customers charge this year with the amount that they charged last year. The mean increase is $565, and the standard deviation is $267.
(a) Is there significant evidence at the 1% level that the mean amount charged increases under the no-fee offer? State $H_0$ and $H_a$ and carry out a $t$ test.
(b) Give a 95% confidence interval for the mean amount of the increase.

8.5 Gambling is an issue of great concern to those involved in intercollegiate athletics. Because of this concern, the National Collegiate Athletic Association (NCAA) surveyed student-athletes concerning their gambling-related behaviors. There were 5594 Division I male athletes in the survey. Of these, 3547 reported participation in some gambling behavior. This includes playing cards, betting on games of skill, buying lottery tickets, betting on sports, and similar activities.
(a) Find the sample proportion and the large-sample margin of error for 95% confidence. Explain in simple terms the meaning of the 95%.

8.45 A study was designed to find reasons why patients leave a health maintenance organization (HMO). Patients were classified as to whether or not they had filed a complaint with the HMO. We want to compare the proportion of complainers who leave the HMO with the proportion of those who do not file complaints but who also leave the HMO. In the year of the study, 639 patients filed complaints, and 54 of these patients left the HMO voluntarily. For comparison, the HMO chose an SRS of 743 patients who had not filed complaints. Twenty-two of these patients left voluntarily. Give an estimate of the difference in the two proportions with a 95% confidence interval.

8.46 In the previous exercise you examined data from a study designed to find reasons why patients leave an HMO. There you compared the proportion of complainers who leave the HMO with the proportion of noncomplainers who leave. In the year of the study, 639 patients filed complaints and 54 of these patients left the HMO voluntarily. For comparison, the HMO chose an SRS of 743 patients who had not filed complaints. Twenty-two of those patients left voluntarily. We expect a higher proportion of complainers to leave. Do the data support this expectation? State hypotheses, find the test statistic and its $P$-value, and state your conclusion.
8.58 Following complaints about the working conditions in some apparel factories both in the United States and abroad, a joint government and industry commission recommended in 1998 that companies that monitor and enforce proper standards be allowed to display a "No Sweat" label on their products. Does the presence of these labels influence consumer behavior? A survey of U.S. residents aged 18 or older asked a series of questions about how likely they would be to purchase a garment under various conditions. For some conditions, it was stated that the garment had a "No Sweat" label; for others, there was no mention of such a label. On the basis of the responses, each person was classified as a "label user" or a "label nonuser." There were 296 women surveyed. Of these, 63 were label users. On the other hand, 27 of 251 men were classified as users.

(a) Give a 95% confidence interval for the difference in the proportions.

(b) You would like to compare the women with the men. Set up appropriate hypotheses, and find the test statistic and the P-value. What do you conclude?

8.72 Gastric freezing was once a recommended treatment for ulcers in the upper intestine. A randomized comparative experiment found that 28 of the 82 patients who were subjected to gastric freezing improved, while 30 of the 78 patients in the control group improved.

(a) State the appropriate null hypothesis and a two-sided alternative. Carry out a z test. What is the P-value?

(b) What do you conclude about the effectiveness of gastric freezing as a treatment for ulcers? (See Example 3.5 on page 197 for a discussion of gastric freezing.)