c. Based on the results, does there appear to be a difference between the hit rates of New York City police and Los Angeles police?

15. Headache Treatment In a study of treatments for very painful "cluster" headaches, 150 patients were treated with oxygen and 148 other patients were given a placebo consisting of ordinary air. Among the 150 patients in the oxygen treatment group, 116 were free from headaches 15 minutes after treatment. Among the 148 patients given the placebo, 29 were free from headaches 15 minutes after treatment (based on data from "High-Flow Oxygen for Treatment of Cluster Headache," by Cohen, Burns, and Goadsby, *Journal of the American Medical Association,* Vol. 302, No. 22). We want to use a 0.01 significance level to test the claim that the oxygen treatment is effective.

a. Test the claim using a hypothesis test.

b. Test the claim by constructing an appropriate confidence interval.

c. Based on the results, is the oxygen treatment effective?

16. Spending Large and Small Bills In the same study cited in Example 1, another trial was conducted with 75 women in China given a 100-Yuan bill, while another 75 women in China were given 100 Yuan in the form of smaller bills (a 50-Yuan bill plus two 20-Yuan bills plus two 5-Yuan bills). Among those given the single bill, 60 spent some or all of the money. Among those given the smaller bills, 68 spent some or all of the money. We want to use a 0.05 significance level to test the claim that when given a single large bill, a smaller proportion of women in China spend some or all of the money when compared to the proportion of women in China given the same amount in smaller bills.

a. Test the claim using a hypothesis test.

b. Test the claim by constructing an appropriate confidence interval.

c. If the significance level is changed to 0.01, does the conclusion change?

17. Lefties In a random sample of males, it was found that 23 write with their left hands and 217 do not. In a random sample of females, it was found that 65 write with their left hands and 455 do not (based on data from "The Left-Handed: Their Sinister History," by Elaine Fowler Costas, Education Resources Information Center, Paper 399519). We want to use a 0.01 significance level to test the claim that the rate of left-handedness among males is less than that among females.

a. Test the claim using a hypothesis test.

b. Test the claim by constructing an appropriate confidence interval.

c. Based on the results, is the rate of left-handedness among males less than the rate of left-handedness among females?

18. Marathon Finishers In a recent New York City marathon, 25,221 men finished and 253 dropped out. Also, 12,883 women finished and 163 dropped out (based on data from the *New York Times*). We want to use a 0.01 significance level to test the claim that the rate of those who finish is the same for men and women.

a. Test the claim using a hypothesis test.

b. Test the claim by constructing an appropriate confidence interval.

c. Based on the results, do men and women finish the New York City marathon at the same rate?