

1. The inference procedure for evaluating a claim made about a proportion is called a “one-sample z -test for p ”.
 - a. Why does the name of the procedure include “one-sample”?
 - b. Why does the name of the procedure include “ z ”?
 - c. Why does the name of the procedure include “test”?
 - d. Why does the name of the procedure include “for p ”?

2. Just before an election in a large city, a news organization polled a random sample of registered voters. 62% of the registered voters in the sample favored a proposal that would increase funding for the local library. To determine if there is convincing evidence that the proposal will pass, the news organization performs a hypothesis test of $H_0 : p = 0.50$ versus $H_a : p > 0.50$, where p = the true proportion of all registered voters in the city who are in favor of the proposal. The p -value for the hypothesis test is 0.19.

- a. Explain in words the meaning of the alternative hypothesis.
- b. Do the results from the sample provide some evidence that the proposal will pass?
- c. Do the results from the sample provide convincing evidence that the proposal will pass?
- d. Explain how results can have some evidence for a claim, but not convincing evidence for the claim.

3. A recent online article claimed that 33% of American adults have never built a snowman. André, an AP Stats student in Canada, wonders if this claim is different for Canadian adults. He selects a random sample of 200 Canadian adults and finds that 50 of them have never built a snowman.
- a. Is there convincing statistical evidence, at $\alpha = 0.05$, that the true proportion of all Canadian adults who have never built a snowman is different than the proportion for Americans? Complete the appropriate inference procedure to support your answer.
- b. A 95% confidence interval for the true proportion of all Canadian adults who have never built a snowman is (0.19, 0.31). Explain how the confidence interval is consistent with the conclusion in part (a).
4. A fair coin that is randomly tossed would show “heads” 50% of the time in the long run. For each pair of results, which one gives more convincing evidence that a coin is unfair? Explain.
- a. Result 1: 10 coin tosses. 3 show heads.
Result 2: 10 coin tosses. 9 show heads.
- b. Result 1: 10 coin tosses. 9 show heads.
Result 2: 100 coin tosses. 90 show heads.

5. A manager at the Department of Motor Vehicles wonders if less than 50% of young adults (ages 16-18 years) have a driver's license. The manager selects a random sample of 300 young adults and finds that 42% of them have a driver's license. For the manager to perform a hypothesis test and calculate a p -value, what claim will be assumed to be true?
- A) The proportion of all young adults who have a driver's license is 0.42.
 - B) The proportion of all young adults who have a driver's license is less than 0.42.
 - C) The proportion of all young adults who have a driver's license is 0.50.
 - D) The proportion of all young adults who have a driver's license is less than 0.50.
6. In the United States, about 2% of new car sales are convertibles. A market researcher believes that the proportion of new car sales that are convertibles is greater in the state of California. The researcher selects a random sample of 600 new car sales in California and finds that 18 of them are convertibles. The researcher performs a hypothesis test and calculates a p -value of 0.04. At $\alpha = 0.01$, what conclusion should be made?
- A) Reject H_0 . There is convincing evidence that the true proportion of all new car sales in California that are convertibles is greater than 0.02.
 - B) Reject H_0 . There is not convincing evidence that the true proportion of all new car sales in California that are convertibles is greater than 0.02.
 - C) Fail to reject H_0 . There is convincing evidence that the true proportion of all new car sales in California that are convertibles is greater than 0.02.
 - D) Fail to reject H_0 . There is not convincing evidence that the true proportion of all new car sales in California that are convertibles is greater than 0.02.