

- Question # 1.** How many standard errors around the hypothesized value should we use to be 99.44 percent certain that we accept the hypothesis when it is true?
- Question # 2.** An automobile manufacturer claims that a particular model gets 28 miles to the gallon. The Environmental Protection Agency, using a sample of 49 automobiles of this model, finds the sample mean to be 26.8 miles per gallon. From previous studies, the population standard deviation is known to be 5 miles per gallon. Could we reasonably expect (within 2 standard errors) that we could select such a sample if indeed the population mean is actually 28 miles per gallon?
- Question # 3.** Given the following hypothesis:
 $H_0: \mu = 400$
 $H_1: \mu \neq 400$
 For a random sample of 12 observations, the sample mean was 407 and the sample standard deviation 6. Using the .01 significance level:
 A. State the decision rule.
 B. Compute the value of the test statistics.
 C. What is your decision regarding the null hypothesis?
- Question # 4.** The following hypotheses are given.
 $H_0: \pi \leq .70$
 $H_1: \pi > .70$
 A sample of 100 observations revealed that $p = .75$. At the .05 significance level, can the null hypothesis be rejected?
 A. State the decision rule.
 B. Compute the value of the test statistic
 C. What is your decision regarding the null hypothesis?
- Question # 5.** The following hypotheses are given:
 $H_0: \pi = .40$
 $H_1: \pi \neq .40$
 A sample of 120 observations revealed that $p = .30$. At the .05 significance level, can the null hypothesis be rejected?
 A. State the decision rule.
 B. Compute the value of the test statistic.
 C. What is your decision regarding the null hypothesis?
- Question # 6.** The manufacturer of The X-15 steel-belted radial truck tire claims that the mean mileage the tire can be driven before the tread wears out is 60,000 miles. The population standard deviation of the mileage is 5,000 miles. Crosset Truck Company bought 48 tires and found that the mean mileage for its trucks is 59,500 miles. Is Crosset's experience different from that claimed by the manufacturer at the .05 significance level?
- Question # 7.** At the time she was hired as a server at the Grumney Family Restaurant, Beth Brigden was told, "You can average more than \$80 a day in tips." Assume the standard deviation of the population distribution is \$3.24. Over the first 35 days she was employed at the restaurant, the mean daily amount of her tips was \$84.85. At the 0.1 significance level, can Ms. Brigden conclude that she is earning an average of more than \$80 in tips?

Question # 8. Research at the University of Toledo indicates that 50 percent of students change their major area of study after their first year in a program. A random sample of 100 students in the College of Business revealed that 48 had changed their major area of study after their first year of the program. Has there been a significant decrease in the proportion of students who change their major after the first year in this program? Test at $\alpha = 0.05$.

Question # 9. The McFarland Insurance Company Claims Department reports the mean cost to process a claim is \$60. An industry comparison showed this amount to be larger than most other insurance companies, so the company instituted cost-cutting measures. To evaluate the effect of the cost-cutting measures, the Supervisor of the Claims Department selected a random sample of 26 claims processed last month. The sample information is reported below.

\$45	\$49	\$62	\$40	\$43	\$61
48	53	67	63	78	64
48	54	51	56	63	69
58	51	58	59	56	57
38	76				

At the .01 significance level is it reasonable to conclude that mean cost to process a claim is now less than \$60?