

This is a test from a previous semester. Remember, the content may not line up exactly every semester. This test was given before I covered chapter 18.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use the confidence level and sample data to find a confidence interval for estimating the population μ . Round your answer to the same number of decimal places as the sample mean.

- 1) A group of 66 randomly selected students have a mean score of 22.4 with a population standard deviation of 2.8 on a placement test. What is the 90% confidence interval for the mean score, μ , of all students taking the test? 1) _____
- A) $21.8 < \mu < 23.0$ B) $21.6 < \mu < 23.2$ C) $21.7 < \mu < 23.1$ D) $21.5 < \mu < 23.3$

Use the confidence level and sample data to find the margin of error E. Round your answer to the same number of decimal places as the sample mean unless otherwise noted.

- 2) College students' annual earnings: 99% confidence; $n = 76$, $\bar{x} = \$3016$, $\sigma = \$872$ 2) _____
- A) \$258 B) \$891 C) \$196 D) \$233

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ . Assume that the population has a normal distribution.

- 3) A savings and loan association needs information concerning the checking account balances of its local customers. A random sample of 14 accounts was checked and yielded a mean balance of \$664.14 and a standard deviation of \$297.29. Find a 98% confidence interval for the true mean checking account balance for local customers. 3) _____
- A) $\$453.59 < \mu < \874.69 B) $\$493.71 < \mu < \834.57
C) $\$492.52 < \mu < \835.76 D) $\$455.65 < \mu < \872.63

Assume that a sample is used to estimate a population mean μ . Use the given confidence level and sample data to find the margin of error. Assume that the sample is a simple random sample and the population has a normal distribution. Round your answer to one more decimal place than the sample standard deviation.

- 4) 95% confidence; $n = 91$; $\bar{x} = 16$, $s = 9.1$ 4) _____
- A) 4.10 B) 1.90 C) 1.63 D) 1.71

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

- 5) Define P-values. Explain the two methods of interpreting P-values. 5) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 6) Suppose that you wish to test a claim about a population mean. Which distribution should be used given that the sample is a voluntary response sample, σ is unknown, $n = 15$, and the population is normally distributed? 6) _____
- A) Neither the normal nor the t-distribution
B) t-distribution
C) Normal distribution

Solve the problem.

- 7) True or False: In a hypothesis test regarding a population mean, the probability of a type II error, β , depends on the true value of the population mean. 7) _____
- A) True B) False

Express the null hypothesis and the alternative hypothesis in symbolic form. Use the correct symbol(μ , p , σ) for the indicated parameter.

8) A researcher claims that the amounts of acetaminophen in a certain brand of cold tablets have a mean different from the $\mu = 3.3$ mg claimed by the manufacturer. 8) _____

- A) $H_0: \mu = 3.3$ mg B) $H_0: \mu \geq 3.3$ mg C) $H_0: \mu \neq 3.3$ mg D) $H_0: \mu \leq 3.3$ mg
H₁: $\mu \neq 3.3$ mg H₁: $\mu < 3.3$ mg H₁: $\mu = 3.3$ mg H₁: $\mu > 3.3$ mg

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Test the given claim. Use the P-value method or the traditional method as indicated. Identify the null hypothesis, alternative hypothesis, test statistic, critical value(s) or P-value, conclusion about the null hypothesis, and final conclusion that addresses the original claim.

9) A simple random sample of 15-year old boys from one city is obtained and their weights (in pounds) are listed below. Use a 0.01 significance level to test the claim that these sample weights come from a population with a mean equal to 149 lb. Assume that the standard deviation of the weights of all 15-year old boys in the city is known to be 16.2 lb.

147 138 162 151 134 189 157 144 175 127 164

Assume that a simple random sample has been selected from a normally distributed population and test the given claim. Use either the traditional method or P-value method as indicated. Identify the null and alternative hypotheses, test statistic, critical value(s) or P-value (or range of P-values) as appropriate, and state the final conclusion that addresses the original claim.

10) A cereal company claims that the mean weight of the cereal in its packets is 14 oz. The weights (in ounces) of the cereal in a random sample of 8 of its cereal packets are listed below. 10) _____

14.6 13.8 14.1 13.7 14.0 14.4 13.6 14.2

Test the claim at the 0.01 significance level.

Answer Key

Testname: MATH 1231 TEST 3 SG

- 1) A
- 2) A
- 3) A
- 4) B
- 5) A P-value is the probability of getting a value of the sample test statistic that is at least as extreme as the one found from the sample data, assuming that the null hypothesis is true.
 - 1) Compare the P-value to α and reject if $p < \alpha$.
 - 2) State the P-value and leave the conclusion of significance to the reader.
- 6) A
- 7) A
- 8) A
- 9) $H_0: \mu = 149$ lb
 $H_1: \mu \neq 149$ lb
Test statistic: $z = 0.91$
Critical-values: $z = \pm 2.575$
Do not reject H_0 ; At the 1% significance level, there is not sufficient evidence to warrant rejection of the claim that these sample weights come from a population with a mean equal to 149 lb.
- 10) $H_0: \mu = 14$ oz. $H_1: \mu \neq 14$ oz. Test statistic: $t = 0.408$. Critical values: $t = \pm 3.499$. Fail to reject H_0 . There is not sufficient evidence to warrant rejection of the claim that the mean weight is 14 ounces.