

Name _____

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

Solve the problem.

- 1) If the standard deviation of a set of data is zero, what can you conclude about the set of values? 1) _____
 A) The sum of the deviations from the mean is zero.
 B) All values are equal to zero.
 C) The sum of the values is zero.
 D) All values are identical.

- 2) The heights of the adults in one town have a mean of 67.5 inches and a standard deviation of 3.4 inches. What can you conclude from Chebyshev's theorem about the percentage of adults in the town whose heights are between 60.7 and 74.3 inches? 2) _____
 A) The percentage is at most 95% B) The percentage is at most 75%
 C) The percentage is at least 75% D) The percentage is at least 95%

- 3) The weights of the fish in a certain lake are normally distributed with a mean of 12 lb and a standard deviation of 12. If 16 fish are randomly selected, what is the probability that the mean weight will be between 9.6 and 15.6 lb? 3) _____
 A) 0.4032 B) 0.6730 C) 0.0968 D) 0.3270

- 4) In a game, you have a $\frac{1}{42}$ probability of winning \$67 and a $\frac{41}{42}$ probability of losing \$7. What is your expected value? 4) _____
 A) -\$6.83 B) \$1.60 C) -\$5.24 D) \$8.43

Express the null hypothesis H_0 and the alternative hypothesis H_1 in symbolic form. Use the correct symbol (μ , p , σ) for the indicated parameter.

- 5) The manufacturer of a refrigerator system for beer kegs produces refrigerators that are supposed to maintain a true mean temperature, μ , of 48°F, ideal for a certain type of German pilsner. The owner of the brewery does not agree with the refrigerator manufacturer, and claims he can prove that the true mean temperature is incorrect. 5) _____
 A) $H_0: \mu = 48^\circ$ B) $H_0: \mu \leq 48^\circ$ C) $H_0: \mu \neq 48^\circ$ D) $H_0: \mu \geq 48^\circ$
 $H_1: \mu \neq 48^\circ$ $H_1: \mu > 48^\circ$ $H_1: \mu = 48^\circ$ $H_1: \mu < 48^\circ$

- 6) Human heights are normally distributed. Assume the average height for women is 63.6 inches with a standard deviation of 2.5 inches; find the height that separates the bottom 40% of all women from the top 60%. 6) _____
 A) 52.753 B) 72.115 C) 62.975 D) 64.123

- 7) Find the p-value: For a two-tailed test with test statistic, $z = 2.89$ 7) _____
 A) 0.0019 B) 0.0020 C) 0.0039 D) 0.0001

Find the z-score corresponding to the given value and use the z-score to determine whether the value is unusual. Consider a score to be unusual if its z-score is less than -2.00 or greater than 2.00. Round the z-score to the nearest tenth if necessary.

- 8) A weight of 220 pounds among a population having a mean weight of 161 pounds and a standard deviation of 23.5 pounds. 8) _____
A) 58.8; unusual B) 2.5; not unusual
C) -2.5; not unusual D) 2.5; unusual

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

Test the given claim using the traditional method of hypothesis testing. Assume that the sample has been randomly selected from a population with a normal distribution.

- 9) A test of sobriety involves measuring the subject's motor skills. Twenty randomly selected sober subjects take the test and produce a mean score of 41.0 with a standard deviation of 3.7. At the 0.01 level of significance, test the claim that the true mean score for all sober subjects is equal to 35.0. 9) _____

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

- 10) What kind of test will be conducted if we want to test a claim that the mean is greater than seven? 10) _____
A) half tailed B) right tailed C) two tailed D) left tailed

- 11) If we concluded to not reject the null hypothesis in a test of hypothesis, what kind of error might we have committed? 11) _____
A) type I B) Not enough information
C) type II D) type III

- 12) If the variance for a set of numbers is small this means the numbers are close together or far apart? 12) _____
A) close B) far apart

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.

- 13) A sociologist develops a test to measure attitudes about public transportation, and 27 randomly selected subjects are given the test. Their mean score is 76.2 and their standard deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects. 13) _____
A) $74.6 < \mu < 77.8$ B) $67.7 < \mu < 84.7$ C) $64.2 < \mu < 88.2$ D) $69.2 < \mu < 83.2$

Find the margin of error.

- 14) 95% confidence interval; $n = 21$; $\bar{x} = 0.44$; $s = 0.44$ 14) _____
A) 0.171 B) 0.212 C) 0.200 D) 0.180

Assume that the data has a normal distribution and the number of observations is greater than fifty. Find the critical z value used to test a null hypothesis.

- 15) $\alpha = 0.05$ for a two-tailed test. 15) _____
A) ± 1.645 B) ± 1.96 C) ± 2.575 D) ± 1.764
- 16) If the p-value for a test is 0.0056 and the significance level is 1%, what is your initial conclusion? 16) _____
A) do not support the alternative B) do not reject the null
C) not enough information D) reject the null

Use the given information to find the P-value.

- 17) The test statistic in a two-tailed test is $z = 1.95$. 17) _____
A) 0.0244 B) 0.0512 C) 0.3415 D) 0.4423

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

Identify the null hypothesis, alternative hypothesis, test statistic, P-value, conclusion about the null hypothesis, and final conclusion that addresses the original claim.

- 18) A random sample of 100 pumpkins is obtained and the mean circumference is found to be 40.5 cm. Assuming that the population standard deviation is known to be 1.6 cm, use a 0.05 significance level to test the claim that the mean circumference of all pumpkins is equal to 39.9 cm. (Note: they use the smallest table value for the p-value since the test stat is off the charts.) 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 .

- 19) A random sample of 79 light bulbs had a mean life of $\bar{x} = 400$ hours with a standard deviation of $\sigma = 28$ hours. Construct a 90 percent confidence interval for the mean life, μ , of all light bulbs of this type. 19) _____
A) $395 < \mu < 405$ B) $393 < \mu < 407$ C) $394 < \mu < 406$ D) $392 < \mu < 408$

Assume that a hypothesis test of the given claim will be conducted. Identify the type I or type II error for the test.

- 20) An entomologist writes an article in a scientific journal which claims that fewer than 16 in ten thousand male fireflies are unable to produce light due to a genetic mutation. Identify the type I error for the test. 20) _____
A) The error of rejecting the claim that the true proportion is at least 16 in ten thousand when it really is at least 16 in ten thousand.
B) The error of rejecting the claim that the true proportion is less than 16 in ten thousand when it really is less than 16 in ten thousand.
C) The error of failing to reject the claim that the true proportion is at least 16 in ten thousand when it is actually less than 16 in ten thousand.
- 21) For a left tailed test at the 5% significance level, what is the probability of a type one error? 21) _____
A) at most 5% B) exactly 5% C) at least 5% D) more than 5%

Answer Key

Testname: SAMPLEFINAL

- 1) D
- 2) C
- 3) B
- 4) C
- 5) A
- 6) C
- 7) C
- 8) D
- 9) Test statistic: $t = 7.252$. Critical values: $t = -2.861, 2.861$. Reject the null hypothesis. There is sufficient evidence to warrant rejection of the claim that the mean is equal to 35.0.
- 10) B
- 11) C
- 12) A
- 13) B
- 14) C
- 15) B
- 16) D
- 17) B
- 18) $H_0: \mu = 39.9; H_1: \mu \neq 39.9$. Test statistic: $z = 3.75$. P-value: 0.0001. Reject H_0 . There is sufficient evidence to warrant rejection of the claim that the mean equals 39.9 cm.
- 19) A
- 20) A
- 21) A