

Provide an appropriate response.

- 1) A _____ is a statement or claim regarding a characteristic of one or more populations. 1) _____
 A) conjecture B) fact C) conclusion D) hypothesis

- 2) The _____ hypothesis contains the "=" sign. 2) _____
 A) explanatory B) conditional C) alternative D) null

- 3) A hypothesis test is a "two-tailed" if the alternative hypothesis contains a _____ sign. 3) _____
 A) < B) > C) ≠ D) +

- 4) Given $H_0: \mu \leq 25$ and $H_a: \mu > 25$, determine whether the hypothesis test is left-tailed, right-tailed, or two-tailed. 4) _____
 A) two-tailed B) right-tailed C) left-tailed

- 5) A brewery claims that the mean amount of beer in their bottles is at least 12 ounces. Determine whether the hypothesis test for this claim is left-tailed, right-tailed, or two-tailed. 5) _____
 A) two-tailed B) left-tailed C) right-tailed

- 6) A car maker claims that its new sub-compact car gets better than 47 miles per gallon on the highway. Determine whether the hypothesis test for this is left-tailed, right-tailed, or two-tailed. 6) _____
 A) left-tailed B) right-tailed C) two-tailed

- 7) The owner of a professional basketball team claims that the mean attendance at games is over 25,000 and therefore the team needs a new arena. Determine whether the hypothesis test for this claim is left-tailed, right-tailed, or two-tailed. 7) _____
 A) left-tailed B) two-tailed C) right-tailed

- 8) A researcher claims that 73% of voters favor gun control. Determine whether the hypothesis test for this claim is left-tailed, right-tailed, or two-tailed. 8) _____
 A) two-tailed B) right-tailed C) left-tailed

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

- 9) The manufacturer of a refrigerator system for beer kegs produces refrigerators that are supposed to maintain a true mean temperature, μ , of 43°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. 9) _____
 A) $H_0: \mu \geq 43^\circ$ B) $H_0: \mu \leq 43^\circ$ C) $H_0: \mu = 43^\circ$ D) $H_0: \mu \neq 43^\circ$
 $H_1: \mu < 43^\circ$ $H_1: \mu > 43^\circ$ $H_1: \mu \neq 43^\circ$ $H_1: \mu = 43^\circ$

- 10) A researcher claims that 62% of voters favor gun control. 10) _____
 A) $H_0: p = 0.62$ B) $H_0: p \geq 0.62$ C) $H_0: p < 0.62$ D) $H_0: p \neq 0.62$
 $H_1: p \neq 0.62$ $H_1: p < 0.62$ $H_1: p \geq 0.62$ $H_1: p = 0.62$

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.

- 11) $\alpha = 0.05$ for a two-tailed test. 11) _____
 A) ± 1.764 B) ± 2.575 C) ± 1.96 D) ± 1.645

- 12) $\alpha = 0.09$ for a right-tailed test. 12) _____
 A) ± 1.96 B) 1.96 C) 1.34 D) ± 1.34
- 13) $\alpha = 0.05$ for a left-tailed test. 13) _____
 A) -1.96 B) ± 1.96 C) ± 1.645 D) -1.645
- 14) $\alpha = 0.1$ for a two-tailed test. 14) _____
 A) ± 1.645 B) ± 1.4805 C) ± 2.052 D) ± 2.33
- 15) $\alpha = 0.08$; H_1 is $\mu \neq 3.24$ 15) _____
 A) 1.75 B) ± 1.75 C) 1.41 D) ± 1.41

Provide an appropriate response.

- 16) Find the critical value for a right-tailed test with $\alpha = 0.01$ and $n = 75$. 16) _____
 A) 2.33 B) 1.645 C) 2.575 D) 1.96
- 17) Find the critical value for a two-tailed test with $\alpha = 0.01$ and $n = 30$. 17) _____
 A) ± 1.645 B) ± 2.575 C) ± 1.96 D) ± 2.33
- 18) Find the critical value for a left-tailed test with $\alpha = 0.05$ and $n = 48$. 18) _____
 A) -1.96 B) -2.575 C) -1.645 D) -2.33
- 19) Find the critical value for a two-tailed test with $\alpha = 0.10$ and $n = 100$. 19) _____
 A) ± 2.33 B) ± 1.96 C) ± 2.575 D) ± 1.645
- 20) Find the critical value for a two-tailed test with $\alpha = 0.06$ and $n = 36$. 20) _____
 A) ± 1.96 B) ± 1.88 C) ± 2.575 D) ± 2.33
- 21) Find the critical values for a sample with $n = 10$ and $\alpha = 0.05$ if $H_0: \mu \geq 20$. 21) _____
 A) -1.833 B) -3.250 C) -1.383 D) -2.262

Determine whether the hypothesis test involves a sampling distribution of means that is a normal distribution, Student t distribution, or neither.

- 22) Claim: $\mu = 981$. Sample data: $n = 24$, $\bar{x} = 972$, $s = 26$. The sample data appear to come from a normally distributed population with $\sigma = 28$. 22) _____
 A) Normal B) Neither C) Student t
- 23) Claim: $\mu = 120$. Sample data: $n = 11$, $\bar{x} = 100$, $s = 15.2$. The sample data appear to come from a normally distributed population with unknown μ and σ . 23) _____
 A) Neither B) Normal C) Student t
- 24) Claim: $\mu = 82$. Sample data: $n = 20$, $\bar{x} = 100$, $s = 15.1$. The sample data appear to come from a population with a distribution that is very far from normal, and σ is unknown. 24) _____
 A) Normal B) Student t C) Neither

Provide an appropriate response.

- 25) If we reject the null hypothesis when the null hypothesis is true, then we have made a 25) _____
 A) Type I error B) Correct decision
 C) Type α error D) Type II error

- 26) If we do not reject the null hypothesis when the null hypothesis is in error, then we have made a _____
 A) Correct decision B) Type I error
 C) Type β error D) Type II error
- 27) The level of significance, α , is the probability of making a _____
 A) Type β error B) Type II error
 C) Correct decision D) Type I error
- 28) You wish to test the claim that $\mu \leq 38$ at a level of significance of $\alpha = 0.01$ and are given sample statistics $n = 40$, $\bar{x} = 39.8$, and $s = 4.3$. Compute the value of the standardized test statistic. Round your answer to two decimal places. _____
 A) 2.12 B) 3.51 C) 1.96 D) 2.65
- 29) Suppose you want to test the claim that $\mu > 25.6$. Given a sample size of $n = 42$ and a level of significance of $\alpha = 0.1$, when should you reject H_0 ? _____
 A) Reject H_0 if the standardized test statistic is greater than 1.96.
 B) Reject H_0 if the standardized test statistic is greater than 1.645.
 C) Reject H_0 if the standardized test statistic is greater than 1.28.
 D) Reject H_0 if the standardized test statistic is greater than 2.575.
- 30) Find the critical values for a sample with $n = 25$ and $\alpha = 0.005$ if $H_0: \mu > 20$. _____
 A) 2.797 B) 2.064 C) 2.492 D) 1.711
- 31) Find the standardized test statistic t for a sample with $n = 10$, $\bar{x} = 7.9$, $s = 1.3$, and $\alpha = 0.05$ if $H_0: \mu \geq 8.8$. Round your answer to three decimal places. _____
 A) -3.010 B) -2.189 C) -2.617 D) -3.186
- 32) Find the standardized test statistic t for a sample with $n = 15$, $\bar{x} = 7$, $s = 0.8$, and $\alpha = 0.05$ if $H_0: \mu \leq 6.7$. Round your answer to three decimal places. _____
 A) 1.728 B) 1.312 C) 1.631 D) 1.452
- 33) Find the standardized test statistic t for a sample with $n = 25$, $\bar{x} = 21$, $s = 3$, and $\alpha = 0.005$ if $H_a: \mu > 20$. Round your answer to three decimal places. _____
 A) 1.997 B) 1.239 C) 1.667 D) 1.452
- 34) Find the standardized test statistic t for a sample with $n = 12$, $\bar{x} = 17.4$, $s = 2.1$, and $\alpha = 0.01$ if $H_a: \mu \neq 17.9$. Round your answer to three decimal places. _____
 A) -0.825 B) -0.381 C) -0.037 D) -0.008
- 35) The business college computing center wants to determine the proportion of business students who have personal computers (PC's) at home. If the proportion exceeds 25%, then the lab will scale back a proposed enlargement of its facilities. Suppose 200 business students were randomly sampled and 65 have PC's at home. Find the rejection region for this test using $\alpha = 0.01$. _____
 A) Reject H_0 if $z < -2.33$. B) Reject H_0 if $z > 2.33$.
 C) Reject H_0 if $z > 2.575$ or $z < -2.575$. D) Reject H_0 if $z = 2.33$.

- 36) A survey claims that 9 out of 10 doctors (i.e., 90%) recommend brand Z for their patients who have children. To test this claim against the alternative that the actual proportion of doctors who recommend brand Z is less than 90%, a random sample of 100 doctors results in 94 who indicate that they recommend brand Z. The test statistic in this problem is approximately: 36) _____
- A) 1.83 B) -1.33 C) 1.67 D) 1.33

- 37) Find the standardized test statistic to test the hypothesis that $\mu_1 = \mu_2$. Two samples are randomly selected from each population. The sample statistics are given below. Use $\alpha = 0.05$. 37) _____
- $n_1 = 40$ $n_2 = 35$
 $\bar{x}_1 = 13$ $\bar{x}_2 = 14$
 $s_1 = 2.5$ $s_2 = 2.8$
- A) -1.6 B) -1.0 C) -2.6 D) -0.8

- 38) Find the standardized test statistic to test the hypothesis that $\mu_1 > \mu_2$. Two samples are randomly selected from each population. The sample statistics are given below. Use $\alpha = 0.05$. 38) _____
- $n_1 = 100$ $n_2 = 125$
 $\bar{x}_1 = 480$ $\bar{x}_2 = 465$
 $s_1 = 45$ $s_2 = 25$
- A) 0.91 B) 1.86 C) 2.81 D) 2.98

Assume that you want to test the claim that the paired sample data come from a population for which the mean difference is $\mu_d = 0$. Compute the value of the t test statistic. Round intermediate calculations to four decimal places as needed and final answers to three decimal places as needed.

- 39) The following table shows the weights of nine subjects before and after following a particular diet for two months. You wish to test the claim that the diet is effective in helping people lose weight. What is the value of the appropriate test statistic? 39) _____

Subject	A	B	C	D	E	F	G	H	I
Before	168	180	157	132	202	124	190	210	171
After	162	178	145	125	171	126	180	195	163

- A) 9.468 B) 0.351 C) 3.156 D) 1.052

- 40) A farmer has decided to use a new additive to grow his crops. He divided his farm into 10 plots and kept records of the corn yield (in bushels) before and after using the additive. The results are shown below. 40) _____

Plot:	1	2	3	4	5	6	7	8	9	10
Before	9	9	8	7	6	8	5	9	10	11
After	10	9	9	8	7	10	6	10	10	12

You wish to test the following hypothesis at the 1 percent level of significance.

$H_0: \mu_d = 0$ against $H_1: \mu_d \neq 0$.

What is the value of the appropriate test statistic?

- A) 5.014 B) 2.033 C) 1.584 D) 2.536