First Name:_____ Last Name:_____ **Section 8.3-8.4** Class Time: M Tu W Th math10 - **HW9**

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

1) What are the critical value for a two-tailed t test when $\alpha = 0.02$ and $n = 19$? 1) _____
    A) ±2.110   B) ±2.552   C) ±2.567   D) ±2.878

2) Find the critical values for the following values of the significance level α, sample 2) _____
size n, and alternate hypothesis H_1.

    $\alpha = 0.01, n = 8, H_1: \mu \neq \mu_0$

    A) -2.998, 2.998   B) -2.326, 2.326   C) -3.499, 3.499   D) -3.355, 3.355

3) What is the critical value for a right-tailed t test when $\alpha = 0.025$ and $n = 13$? 3) _____
    A) 0.695   B) 2.201   C) 2.179   D) 0.697

4) Find the critical value for the following values of the significance level α, sample size n, 4) _____
and alternate hypothesis H_1.

    $\alpha = 0.05, n = 7, H_1: \mu < \mu_0$

    A) -1.943   B) -1.895   C) -2.447   D) -1.645

5) The mean annual tuition and fees for a sample of 12 private colleges was $36,800 with 5) _____
a standard deviation of $5000. A dotplot shows that it is reasonable to assume that the
population is approximately normal. You wish to test whether the mean tuition and fees
for private colleges is different from $33,700.

    Compute the value of the test statistic and state the number of degrees of freedom.
    A) 2.148; 12 degrees of freedom   B) 0.620; 12 degrees of freedom
    C) 0.620; 11 degrees of freedom   D) 2.148; 11 degrees of freedom

6) According to *Beautiful Bride* magazine, the average age of a groom is now 26.2 years. 6) _____
A sample of 16 prospective grooms in Chicago revealed that their average age was 26.6
years with a standard deviation of 5.3 years. What is the test value for a t test of the
claim?
    A) 1.81   B) 0.59   C) 2.13   D) 0.30

7) Sam Ying, a career counselor, claims the average number of years of schooling for an 7) _____
engineer is 15.8 years. A sample of 16 engineers had a mean of 15.0 years and a
standard deviation of 1.5 years. The test value used in evaluating the claim would be
-2.68.
    A) True   B) False

8) The mean annual tuition and fees for a sample of 11 private colleges was $34,100 with a standard deviation of $5400 A dotplot shows that it is reasonable to assume that the population is approximately normal. You wish to test whether the mean tuition and fees for private colleges is different from $35,700.

8) _____

State a conclusion regarding H_0. Use the $\alpha = 0.10$ level of significance.

A) Do not reject H_0.

There is insufficient evidence to conclude that the mean annual tuition and fees is different from $35,700.

B) Reject H_0. The mean annual tuition and fees appears to be different from $35,700.

C) There is not enough information to draw a conclusion.

9) Historically, a certain region has experienced 65 thunder days annually. (A "thunder day" is day on which at least one instance of thunder is audible to a normal human ear). Over the past eleven years, the mean number of thunder days is 55 with a standard deviation of 20. Can you conclude that the mean number of thunder days is less than 65? Use the $\alpha = 0.01$ level of significance.

9) _____

A) No. There is insufficient evidence to conclude that the number of thunder days is le than 65.

B) There is not enough information to draw a conclusion.

C) Yes. The number of thunder days appears to be less than 65.

10) The following display from a TI-84 Plus calculator presents the results of a hypothesis test for a population mean μ.

10) _____

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│        T-Test        │
│  μ < 57              │
│  t = -0.813808       │
│  p = 0.209974        │
│  x̄ = 56.76           │
│  Sx = 2.02180        │
│  n = 47              │
│                      │
│                      │
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How many degrees of freedom are there?

A) 46   B) 48   C) 47   D) 57

11) At a certain university, the average attendance at basketball games has been 2725. This year the attendance for the first 14 games has been 2265 with a standard deviation of 485. The athletic director claims that the attendance is the same as last year. If $\alpha = 0.05$, what are the critical values for this two-tailed t test?

11) _____

A) ±2.160   B) ±2.145   C) ±1.771   D) ±1.761

12) The mean annual tuition and fees for a sample of 12 private colleges was $27,900 with a standard deviation of $4400. A dotplot shows that it is reasonable to assume that the population is approximately normal. You wish to test whether the mean tuition and fees for private colleges is different from $31,500.

12) _____

State the null and alternate hypotheses.
A) $H_0: \mu = 31,500, H_1: \mu \neq 31,500$
B) $H_0: \mu = 31,500, H_1: \mu = 27,900$
C) $H_0: \mu = 27,900, H_1: \mu \neq 27,900$
D) $H_0: \mu \neq 31,500, H_1: \mu = 31,500$

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

13) Science fiction novels average 290 pages in length. The average length of 10 randomly chosen novels written by I. M. Wordy was 365 pages in length with a standard deviation of 50. At $\alpha = 0.05$, are Wordy's novels significantly longer than the average science fiction novel?

13) _____

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

14) In a simple random sample of size 88, there were 22 individuals in the category of interest. It is desired to test $H_0: p = 0.31$ versus $H_1: p < 0.31$. Compute the test statistic z.

14) _____

A) -1.22   B) 0.25   C) 4.97   D) 0.05

15) In a simple random sample of size 64, there were 32 individuals in the category of interest. It is desired to test $H_0: p = 0.36$ versus $H_1: p < 0.36$. Do you reject H_0 at the 0.05 level?

15) _____

A) Yes   B) No

16) A scientist claims that only 65% of geese in his area fly south for the winter. He tags 65 random geese in the summer and finds that 20 of them do not fly south in the winter. If $\alpha = 0.05$, is the scientist's belief warranted?

16) _____

A) No, because the test value -0.72 is in the noncritical region.
B) Yes, because the test value -0.79 is in the noncritical region.
C) No, because the test value 0.79 is in the critical region.
D) Yes, because the test value 0.72 is in the noncritical region.

17) A political strategist claims that 56% of voters in Madison County support his candidate. In a poll of 300 randomly selected voters, 150 of them support the strategist's candidate. At $\alpha = 0.05$, is the political strategist's claim warranted?

17) _____

A) No, because the test value -2.72 is in the critical region.
B) Yes, because the test value -1.23 is in the critical region.
C) Yes, because the test value -2.72 is in the noncritical region.
D) No, because the test value -2.09 is in the critical region.

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

18) At a certain university, 16% of students fail general chemistry on their first attempt. Professor Brown teaches at this university and believes that the rate of first-time failure in his general chemistry classes is 33%. He samples 96 students from last semester who were first-time enrollees in general chemistry and finds that 15 of them failed his course.

     18) _____

   i). State the appropriate null and alternate hypotheses.
  ii). Compute the test statistic z.
  iii). Using $\alpha = 0.05$, can you conclude that the percentage of failures differs from 33%?

1) B
2) C
3) C
4) A
5) D
6) D
7) B
8) A
9) A
10) A
11) A
12) A
13) $H_0 : \mu = 290$ and $H_1 : \mu > 290$ (claim)

Critical value: 1.833

Test value: 4.743

The conclusion is to reject the null hypothesis.

There is enough evidence to support the claim that Wordy's novels are longer than the average science
fiction novel.
14) A
15) B
16) D
17) D
18) i). $H_0: p = 0.33$, $H_1: p \neq 0.33$

ii). -3.63

iii). Yes