Name: _____

True or False:

1. Confidence intervals based on the *t*-distribution are wider than those based on the standard normal distribution.
T or F

2. A hypothesis test for a sample mean with small samples and sample size of *n* has *n*/2 degrees of freedom.
T or F

3. The *t*-distribution has less variability than the standard normal distribution.
T or F

Short Answer:

4. The quantity $T = \dfrac{\bar{X} - \mu}{S / \sqrt{n}}$ has _____ degrees of freedom.

5. The *t*-distribution is symmetric about _____.

6. The upper .01 point of the *t*-distribution with 14 d.f. is _____.

7. The lower .05 point of the *t*-distribution with 7 d.f. is _____.

8. The 97.5th percentile of the t-distribution with 23 d.f. is _____.

9. For the t-distribution with 11 d.f. the probability $T > 2.9$ is between _____ and _____.

Computations:

10. Given the following, compute a 95% confidence interval for the population mean, μ.
$n = 17$, $\sum x_i = 220$, $\sum (x_i - \bar{x})^2 = 75$

11. A manager wants to estimate the time it takes to process an order. A random sample of 6 recent orders yields the following times:
    28 26 25 30 22 34
Determine a 90% confidence interval for the true time to fill orders. State any assumptions you make.

True or False:

1. The χ^2 distribution is an example of a symmetric distribution.
T or F

2. Inferences on a population standard deviation are based on the *t*-distribution.
T or F

3. If a 95% confidence interval contains a particular value, μ_0, then the two sided hypothesis test with a null hypothesis using μ_0 with $\alpha = .05$ would lead to a rejection of the null hypothesis.
T or F

Short Answer:

4. The upper 5% of the χ^2 distribution with 8 degrees of freedom is _____.

5. 30.19 is the upper _____% of the χ^2 with 17 degrees of freedom.

6. The lower 5% of the χ^2 distribution with 22 degrees of freedom is _____.

(For 7 and 8.) Suppose that from a random sample a 90% confidence interval for the population mean has been found to be (12.8, 14.3).

7. Would $H_0 : \mu = 15$ be rejected in favor of $H_1 : \mu \neq 15$ at $\alpha = .10$?

a) yes
b) no
c) cannot tell

8. Would $H_0 : \mu = 13$ be rejected in favor of $H_1 : \mu \neq 13$ at $\alpha = .10$?

a) yes
b) no
c) cannot tell

Computations:

9. For data from a set of n=10 observations, one has calculated the 95% confidence interval for σ and obtained the result (4.05, 10.75).

a. What was the standard deviation *s* for the sample? (Hint: Examine how s enters the formula of a confidence interval.)

b. Calculate a 90% confidence interval for σ.