MATH 1342

Homework 10 (Sections 7.4 – 7.5)

Instructions: Answer all questions through the EMCF tab of casa under the assignment named "Homework 10" before the deadline.

There is no "Submit" button. Your answers will be automatically submitted once the deadline arrives.

Assignments will be graded out of 20 points.

1. Section 7.4; Problem 2 A. True B. False

2. Section 7.4; Problem 4 A. True B. False

3. Section 7.4; Problem 5 A. True B. False

4. Section 7.4; Problem 6: Which test should be used here?

   A. One sample z-test for means

   B. One sample t-test for means

5. Section 7.4; Problem 6: Confidence Interval

   A. [119.68, 125.32] B. [119.05, 125.95]

   C. [119.62, 125.38] D. [113.61, 131.39] E. [119.14, 125.86]

6. Section 7.4; Problem 6: Interpretation

   A. 95% of the population falls within the interval specified.

   B. 95% of the sample was used to calculate the mean.

   C. We are 95% certain that the sample mean falls within the interval.

   D. We are 95% certain that the population mean falls within the interval.

   E. The sample mean will exactly equal the population mean 95% of times

7. Section 7.4; Problem 10: Which test should be used here?

A. One sample z-test for means

B. One sample t-test for means

8. Section 7.4; Problem 10: Confidence Interval

A. [32.05, 37.95]

B. [33.96, 36.04]

C. [34.92, 35.08]

D. [34.19, 35.81]

E. [33.61, 36.39]

9. Section 7.4; Problem 10: Interpretation

A. We are 90% confident that the population mean falls within the interval.

B. We are 95% confident that the population mean falls within the interval.

C. Approximately 90% of the population falls within the interval.

D. Approximately 10% of the population is considered an outlier.

E. Since we assumed a normal distribution, 68% of the population falls within the interval.

10. Section 7.4; Problem 10:

On a second run of the data, it was determined that the sample mean was actually 37 miles instead of the originally reported 35 miles. How will this affect the width of the confidence interval?

A. The new interval would be wider.

B. The new interval would be narrower.

C. There would be no change in the interval width.

11. Section 7.4; Problem 12: Should z* or t* be used here?

A. z* because we are finding a sample size

B. t* because a sample (rather than population) standard deviation is provided.

12. Section 7.4; Problem 12: Sample Size:

A. n = 358 B. n = 19 C. n = 18 D. n = 359 E. n = 947

13. Section 7.5; Problem 2: What test should be used?

A. Two sample z-test for means

B. Two sample t-test for means

14. Section 7.5; Problem 2: Confidence Interval

A. [3.06, 4.34]

B. [131.75, 134.05]

C. [-3.26, 2.66]

D. [2.55, 4.85]

E. [2.52, 4.88]

15. Section 7.5; Problem 6: Test and Assumptions

A. Since the population is not specified as Normally Distributed, the problem cannot be solved.

B. We can assume that the population is normally distributed and solve using a Two Sample z-test for means.

C. We can assume that the population is normally distributed and solve using a Two Sample t-test for means.

16. Section 7.5; Problem 6: Confidence Interval

A. [-0.633, 2.833]

B. [-3.237, 5.437]

C. [-3.203, 5.404]

D. [0.789, 1.411]

E. [-7.373, 11.573]

17. In interval estimation, the t distribution is applicable only when

A. the population has a mean of less than 30.

B. the sample standard deviation (s) is given instead of the population standard deviation (σ).

C. the variance of the population is known.

D. the standard deviation of the population is known.

E. we will always use the t distribution.

18. To assess the precision of a laboratory scale, we measure a block known to have a mass of 1 gram. We measure the block n times and record the mean $\bar{x}$ of the measurements. Suppose the scale readings are normally distributed with unknown mean μ and standard deviation $\sigma = 0.001$ g. How large should n be so that a 95% confidence interval for μ has a margin of error of $\pm$ 0.0001?

A. 20

B. 385

C. 10,000

D. 66,358

E. 384

19. A 95% confidence interval for the mean reading achievement score for a population of third grade students is (44.2, 54.2). Suppose you compute a 99% confidence interval using the same information. Which of the following statements is correct?

A. The intervals have the same width.

B. The 99% interval is longer.

C. The 99% interval is shorter.

D. None of the above.

20. The mean caloric intake of an adult male is 2800 with a standard deviation of 115. To verify this information, a sample of 25 men are selected and determined to have a mean caloric intake of 2950. Determine the 98% confidence interval for mean caloric intake of an adult male.

Proposed Solution:

Since n < 30, a t-test must be used.

2950 – qt(1.98/2,24)*115/sqrt(25)

2950 + qt(1.98/2,24)*115/sqrt(25)

[2892.68, 3007.32]

What is wrong with the proposed solution?

A. A normally distributed population was not specified, so the answer cannot be found.

B. There should be 25 degrees of freedom (because the sample size is 25) when calculating t*.

C. A one sample z-test should be used rather than a t-test.

D. Parenthesis are needed around the fraction 115/sqrt(25)

E. There is nothing wrong in the proposed solution.