

Pledge:

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Dr. Lunsford

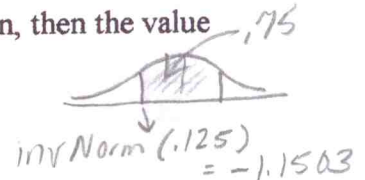
MATH 171
Test 1

Name: Solution
100 Points Possible

I. Short Answer and Multiple Choice. (36 points total)

1. If we want to compute a 75% confidence interval for a population mean, then the value of z^* (rounded to three decimal places) will be: (circle one) (3 points)

- (a) 1.100 (b) 1.405 (c) 1.150 (d) None of the above



2. Indicate whether each of the following statements is true or false by writing "true" or "false" in the blank provided next to each statement. (3 points each, 12 total)

False A) If the correlation between two variables is positive, then the explanatory variable *causes* the response variable.

True B) The margin of error for a confidence interval for the mean μ , based on a specified sample size n , decreases as the confidence level decreases. $\Rightarrow z^* \text{ dec.} \Rightarrow m \text{ dec.}$

False C) In general, individual measurements are less variable than averages.

False D) The margin of error for a 95% confidence interval for the mean μ increases as the sample size increases.

3. Central Middle School has calculated a 95% confidence interval for the mean height (μ) of 11-year old boys at their school and found it to be 57 ± 2 inches. (Note: this means the confidence interval is $55 < \mu < 59$.) Indicate whether each of the following statements is true or false by writing "true" or "false" in the blank provided next to each statement. (3 points each, 6 total)

False B) There is a 95% probability that μ is between 55 and 59. \rightarrow There is either a 100% or 0% probability μ is between 55 and 59

True C) If we took many additional random samples of the same size and from each computed a 95% confidence interval for μ , approximately 95% of these intervals would contain μ . \rightarrow dec conf \Rightarrow dec. m.o.e

4. Which of the following could be the 90% confidence interval based on the same data (i.e. from the Central Middle School) in question 3 above? (circle one) (3 points)

A. 57 ± 1

B. 57 ± 2 .

C. 57 ± 3 .

D. Without knowing the sample size, any of the above answers could be the 90% confidence interval.

5. Weight is a measure that tends to be normally distributed. Suppose the mean weight of all women at a large university is 135 pounds, with a standard deviation of 12 pounds. If you were to randomly sample 9 women at the university, there would be a 68% chance that the *average weight of the 9 women (i.e. the sample mean weight)* would be between: (circle one) (3 points)

(a) 111 and 159 pounds.

(b) 127 and 143 pounds.

(c) 123 and 147 pounds.

(d) 131 and 139 pounds.

(e) 133 and 137 pounds.

$\sigma_{\bar{x}} = \frac{12}{\sqrt{9}} = \frac{12}{3} = 4$ $\downarrow \pm 1 \sigma_{\bar{x}} = \pm 4$

