Math 160 - Quiz 9   Name_____
Due   Tuesday, April 30th

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

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

   1) n = 62, x = 19; 95% confidence   1) _____
      A) 0.190 < p < 0.422   B) 0.209 < p < 0.403
      C) 0.191 < p < 0.421   D) 0.210 < p < 0.402

   2) n = 79, x = 34; 98% confidence   2) _____
      A) 0.321 < p < 0.539   B) 0.299 < p < 0.561
      C) 0.320 < p < 0.540   D) 0.300 < p < 0.560

Use the given data to find the minimum sample size required to estimate the population proportion.

   3) Margin of error: 0.008; confidence level: 99%; $\hat{p}$ and $\hat{q}$ unknown   3) _____
      A) 15,900   B) 26,024   C) 25,894   D) 25,901

   4) Margin of error: 0.027; confidence level: 98%; $\hat{p}$ and $\hat{q}$ unknown   4) _____
      A) 1862   B) 1686   C) 1970   D) 863

   5) Margin of error: 0.04; confidence level: 95%; from a prior study, $\hat{p}$ is estimated by the decimal   5) _____
      equivalent of 89%.
      A) 209   B) 236   C) 9   D) 708

Solve the problem. Round the point estimate to the nearest thousandth.

   6) 386 randomly selected light bulbs were tested in a laboratory, 97 lasted more than 500 hours.   6) _____
      Find a point estimate of the proportion of all light bulbs that last more than 500 hours.
      A) 0.201   B) 0.749   C) 0.251   D) 0.249

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

   7) Of 286 employees selected randomly from one company, 12.59% of them commute by   7) _____
      carpooling. Construct a 90% confidence interval for the true percentage of all employees of the
      company who carpool.
      A) 8.74% < p < 16.4%   B) 8.02% < p < 17.2%
      C) 9.36% < p < 15.8%   D) 7.53% < p < 17.6%

Use the confidence level and sample data to find a confidence interval for estimating the population μ. Round your answer to the same number of decimal places as the sample mean.

   8) 48 packages are randomly selected from packages received by a parcel service. The sample has   8) _____
      a mean weight of 10.1 pounds and a standard deviation of 2.9 pounds. What is the 95%
      confidence interval for the true mean weight, μ, of all packages received by the parcel service?
      A) 9.1 lb < μ < 11.1 lb   B) 9.4 lb < μ < 10.8 lb
      C) 9.0 lb < μ < 11.2 lb   D) 9.3 lb < μ < 10.9 lb

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9) A group of 56 randomly selected students have a mean score of 20.4 with a standard deviation 9) _____
   of 4.4 on a placement test. What is the 90% confidence interval for the mean score, μ, of all
   students taking the test?
      A) $19.4 < \mu < 21.4$ B) $19.2 < \mu < 21.6$ C) $18.9 < \mu < 21.9$ D) $19.0 < \mu < 21.8$

Use the given information to find the minimum sample size required to estimate an unknown population mean μ.
   10) How many students must be randomly selected to estimate the mean weekly earnings of 10) _____
   students at one college? We want 95% confidence that the sample mean is within $2 of the
   population mean, and the population standard deviation is known to be $61.
      A) 3574   B) 3149   C) 2517   D) 5050

   11) How many women must be randomly selected to estimate the mean weight of women in one 11) _____
   age group. We want 90% confidence that the sample mean is within 2.7 lb of the population
   mean, and the population standard deviation is known to be 22 lb.
      A) 180   B) 256   C) 181   D) 178

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ.
Assume that the population has a normal distribution.
   12) n = 10, $\bar{x}$ = 14.4, s = 4.3, 95% confidence 12) _____
      A) $11.32 < \mu < 17.48$ B) $11.34 < \mu < 17.46$
      C) $11.91 < \mu < 16.89$ D) $11.37 < \mu < 17.43$

   13) A sociologist develops a test to measure attitudes towards public transportation, and 27 13) _____
   randomly selected subjects are given the test. Their mean score is 76.2 and their standard
   deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects.
      A) $74.6 < \mu < 77.8$ B) $67.7 < \mu < 84.7$ C) $69.2 < \mu < 83.2$ D) $64.2 < \mu < 88.2$

Use the given degree of confidence and sample data to find a confidence interval for the population standard
deviation σ. Assume that the population has a normal distribution. Round the confidence interval limits to the
same number of decimal places as the sample standard deviation.
   14) Weights of eggs: 95% confidence; n = 22, $\bar{x}$ = 1.38 oz, s = 0.48 oz 14) _____
      A) $0.38 \text{ oz} < \sigma < 0.65 \text{ oz}$ B) $0.38 \text{ oz} < \sigma < 0.63 \text{ oz}$
      C) $0.37 \text{ oz} < \sigma < 0.69 \text{ oz}$ D) $0.36 \text{ oz} < \sigma < 0.66 \text{ oz}$

   15) A sociologist develops a test to measure attitudes about public transportation, and 27 15) _____
   randomly selected subjects are given the test. Their mean score is 76.2 and their standard
   deviation is 21.4. Construct the 95% confidence interval for the standard deviation, σ, of the
   scores of all subjects.
      A) $16.6 < \sigma < 28.6$ B) $17.5 < \sigma < 27.8$ C) $16.9 < \sigma < 29.3$ D) $17.2 < \sigma < 27.2$