**Name:** _____ **Class:** _____ **Date:** _____ **ID: A**

# Unit 07-07 - Sample Quiz: Confidence Intervals

**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1.

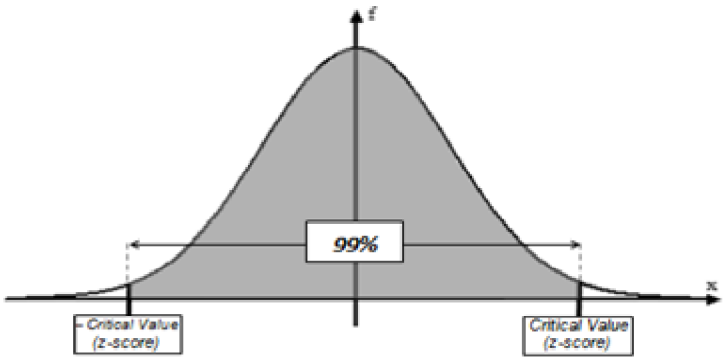
In a weight training class the mean average weight for the bench press is 230 lbs. with a standard deviation of 5 lbs. If 10 students are chosen at random, determine the **standard error**.

a. 0.79
b. 1.58
c. 3.65
d. none of these

____ 2. As the sample size increases for the study increases what happens to the size of the confidence interval.

a. The size of the confidence interval decreases.
b. The size of the confidence interval increases.
c. The size of the confidence interval stays the same.

____ 3. What is the critical value, $z_{\frac{\alpha}{2}}$, associated with a 99% confidence interval?




a. 0.990
b. 1.645
c. 1.960
d. 2.575

____ 4.

A mobile phone company determined with 95% confidence that the a teenager with a mobile phone send an average of 180 text messages ± 20 messages each day.

Which of the following statement is most likely to be true based on the study?

a. There is a 95% probability that every student with a mobile phone sends at least 160 messages a day.
b. There is a 95% probability that every student with a mobile phone sends at most 200 messages a day.
c. There is a 95% probability that the true average of text messages sent by a teenager is somewhere between 160 and 200 text messages a day.
d. There is a 95% probability that the true average of text messages sent by a teenager is 180 text messages a day.

____ 5.

An airline is trying to calculate an expected amount of baggage weight per passenger to predict fuel expenses. Using a relatively large sample the airline determined that the sample mean for each passenger was 34 pounds ($\overline{x} = 34$) of luggage with a standard error of 4 pounds, $\left(\frac{\sigma}{\sqrt{n}} = 4\right)$.


Construct a 99% confidence interval that would describe the actual true average weight of a passenger's luggage weight.

$(-\text{Critical Value}) \cdot (\text{Standard Error}) \leq \mu \leq (\text{Critical Value}) \cdot (\text{Standard Error})$

a. With 99 % confidence the true average weight of a passenger's luggage is **between 30 and 38 pounds.**

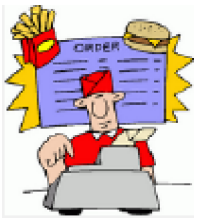
b. With 99 % confidence the true average weight of a passenger's luggage is **between 27.42 and 40.58 pounds.**

c. With 99 % confidence the true average weight of a passenger's luggage is **between 26.16 and 41.84 pounds.**

d. With 99 % confidence the true average weight of a passenger's luggage is **between 23.7 and 44.3 pounds.**

____ 6.

A high school administrator determined at 99% confidence level that 22% of the students worked part-time after school with a ±8% margin of error.




If the school has 1420 students, which would represent the possible number of students that work part-time after school?

a. 199 to 426 students
b. 114 to 312 students
c. 195 to 430 students
d. 47 to 178 students

____ 7. A printer cartridge company claims their ink lasts for more than 5,000 words. The number of words printed is normally distributed with a standard deviation of 20 ($\sigma = 20$)

A sample was taken of 50 cartridges and it was found that they had a mean of 4,940 words. Construct a 95% confidence interval (z = 1.96).

Using the interval does the company's claim hold true?

a. No, the companies claims are above the 95% confidence interval.
b. Yes, the companies claims fall within the 95% confidence interval.
c. No, the companies claims are below the 95% confidence interval.
d. Yes, the companies claims are below the 95% confidence interval.

____ 8.

The store Better Buys knows that the cost to repair a computer is normally distributed with a standard deviation of $40 ($\sigma = 40$).

A random sample of 10 computer repairs and found the average of those 10 computer repairs was $154. Construct a 95% confidence interval of the population mean of a computer repair.

a. $\$75.60 \le \mu \le \$232.40$
b. $\$146.30 \le \mu \le \$161.70$
c. $\$129.21 \le \mu \le \$178.79$
d. $\$146.16 \le \mu \le \$161.84$

____ 9.


An admissions director wants to estimate the mean age of all students enrolled at a college. The estimate must be within 1 year. The ages are not normally distributed so the director knows she will need a sample of at least 30.

Determine the minimum required sample size to construct a 99% confidence interval for the population mean. Assume the population standard deviation is 4.8 years ($\sigma = 4.8$).

a. $n = 48$
b. $n = 62$
c. $n = 114$
d. $n = 153$