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FOIT- Probability and Statistics (Revision Practice Task Sheet 02)

Ch# 8,9

Question 1

Suppose we have data from a sample. The sample mean is 15, and the error bound for the mean is 3.2. What is the confidence interval estimate for the population mean?

Question 2

Suppose we know that a confidence interval is (42.12, 47.88). Find the error bound and the sample mean.

Question 3

The population standard deviation for the height of high school basketball players is three inches. If we want to be 95% confident that the sample mean height is within one inch of the true population mean height, how many randomly selected students must be surveyed?

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Question 4

Suppose average pizza delivery times are normally distributed with an unknown population mean and a population standard deviation of six minutes. A random sample of 28 pizza delivery restaurants is taken and has a sample mean delivery time of 36 minutes.

a. Find a 90% confidence interval estimate for the population mean delivery time, Error Bound(EBM) and sketch the graph

b. Find a 95% confidence interval estimate for the population mean delivery time ,Error Bound(EBM) and sketch the graph

c. Find a 99% confidence interval estimate for the population mean delivery time, Error Bound(EBM) and sketch the graph

Question 5

You do a study of hypnotherapy to determine how effective it is in increasing the number of hours of sleep subjects get each night. You measure hours of sleep for 12 subjects with the following results.

8.2; 9.1; 7.7; 8.6; 6.9; 11.2; 10.1; 9.9; 8.9; 9.2; 7.5; 10.5

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a. Construct a 90% confidence interval for the mean number of hours slept for the population (assumed normal) from which you took the data ,Error Bound(EBM) and sketch the graph

b. Construct a 95% confidence interval for the mean number of hours slept for the population (assumed normal) from which you took the data, Error Bound(EBM) and sketch the graph.

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c. Construct a 99% confidence interval for the mean number of hours slept for the population (assumed normal) from which you took the data, Error Bound(EBM) and sketch the graph

Question 6

A normal distribution has a standard deviation of 1. We want to verify a claim that the mean is greater than 12. A sample of 36 is taken with a sample mean of 12.5.

H0: $\mu \leq 12$

Ha: $\mu > 12$

The *p*-value is 0.0013

Draw a graph that shows the *p*-value and interpret the result taking $\alpha = 5\%$

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Question 7

H0: $\mu = 10$, *Ha*: $\mu < 10$

Assume the *p*-value is 0.0935. What type of test is this? Draw the picture of the *p*-value.

Question 8

A particular brand of tires claims that its deluxe tire averages at least 50,000 miles before it needs to be replaced. From past studies of this tire, the standard deviation is known to be 8,000. A survey of owners of that tire design is conducted. From the 28 tires surveyed, the mean lifespan was 46,500 miles with a standard deviation of 9,800 miles. Using alpha =0.05, is the data highly inconsistent with the claim?

Question 9

From generation to generation, the mean age when smokers first start to smoke varies. However, the standard deviation of that age remains constant of around 2.1 years. A survey of 40 smokers of this generation was done to see if the mean starting age is at least 19. The sample mean was 18.1 with a sample standard deviation of 1.3. Do the data support the claim at the 5% level?

Question 10

An article in the San Jose Mercury News stated that students in the California state university system take 4.5 years, on average, to finish their undergraduate degrees. Suppose you believe that the mean time is longer. You conduct a survey of 49 students and obtain a sample mean of 5.1 with a sample standard deviation of 1.2. Do the data support your claim at the 1% level?

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