Lily ambulance service, which is based in Boston, attends to emergency medical calls in the city. They have a 24-hour call center which receives all calls, takes notes about location and patient's status and assigns the nearest ambulance vehicle to the call. The ambulance vehicle gets a call notifying them of the same. They dispatch to the location after receiving the call and help the patient. The wait time, which is the average time from when the call is received to when the ambulance arrives at the scene, is 17.5 minutes.

Lily Ambulance Services realized that technology intervention may reduce their operating cost and hence introduced an app where people can request for an ambulance using an app (by putting in some of the important information like location and patient condition). Ambulance vehicles directly receive a notification, reducing the need for a call center. Lily Ambulance Services decided to keep the call center while testing the app functionality.

You have been hired to evaluate if the app had any impact on service.

By studying a sample of the data with 150 app requested ambulances, it was determined that the wait times have a mean of 16 minutes with a standard deviation of 6 minutes.

You decide to conduct a hypothesis test to evaluate if the wait times using the app basedrequests are equal to that of the regular call based requests. You assume a significance level of 5%:

H0 : Average wait times in app requests are equal to call based requests.

H1 : Average wait times in app requests are not equal to call based requests.

Part 1

0 points possible (ungraded)
Determine the type of hypothesis test:

- ○ One-Tailed
- ◉ Two-Tailed

Explanation:
Lily Ambulance wants to know if there is any significant change to service. Since the hypothesis test checks for similarity/differences (not if greater than or less than), it is a two tailed test.

Submit You have used 1 of 3 attempts

Answers are displayed within the problem

Part 2

0 points possible (ungraded)
What is the corresponding critical value (the z-value) of the app based requests?
Round your answer to two decimal places.

1.96 1.96

1.96

Explanation:
Since n >30 we are using the normal distribution. Remember that in a two-tailed test we split the confidence level to cover both tails. To find the critical value can use the formula in excel =NORM.S.INV(1-(0.05/2)).

Submit You have used 1 of 3 attempts

Answers are displayed within the problem

Part 3

0 points possible (ungraded)
What is the upper limit of this confidence interval?
Round your answer to two decimal places.

18.46 16.96

18.46

What is the lower limit of this confidence interval?
Round your answer to two decimal places.

16.54 15.04

16.54

Explanation
A confidence interval for the mean of a sample using the normal distribution is given as $\overline{X} \pm c * \frac{S}{\sqrt{n}}$

Where:
$\overline{X}$ is the mean of the sample = 16
c is the z value that covers 95% of the two tailed distribution (or 97.5% of the one tailed distribution) = 1.96
S is the Sample Standard Deviation = 6
n is the sample size = 150

Submit You have used 3 of 3 attempts

Answers are displayed within the problem

Part 4

0 points possible (ungraded)

Compare the test statistic to the critical value and determine the hypothesis test result.

- ○ Fail to reject H0: You are 95% confident that average wait times in app requests are similar to call based requests.
- ◉ Reject H0: You are 95% confident that average wait times in app requests are not similar to call based requests.
- ○ Accept H1: You are 95% confident that average wait times in app requests are not similar to call based requests.

Explanation

You have already calculated the confidence interval for the mean at a 95% confidence level in part 3. Your H0 states that population mean and sample mean are equal. To see if you can reject this null hypothesis all is left to do is check, if the population mean is within this confidence interval of the sample mean. If the population mean is within the confidence interval you cannot reject H0. In this case, because the population mean (17.5) is outside the confidence interval you reject the null hypothesis. (See Lesson 1/Video 12)

Submit You have used 1 of 2 attempts

Answers are displayed within the problem