4. One of the two fire stations in a certain town responds to calls in the northern half of the town, and the other fire station responds to calls in the southern half of the town. One of the town council members believes that the two fire stations have different mean response times. Response time is measured by the difference between the time an emergency call comes into the fire station and the time the first fire truck arrives at the scene of the fire.

   Data were collected to investigate whether the council member's belief is correct. A random sample of 50 calls selected from the northern fire station had a mean response time of 4.3 minutes with a standard deviation of 3.7 minutes. A random sample of 50 calls selected from the southern fire station had a mean response time of 5.3 minutes with a standard deviation of 3.2 minutes.

   (a) Construct and interpret a 95 percent confidence interval for the difference in mean response times between the two fire stations.

   (b) Does the confidence interval in part (a) support the council member's belief that the two fire stations have different mean response times? Explain.

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5. For many years, the medically accepted practice of giving aid to a person experiencing a heart attack was to have the person who placed the emergency call administer chest compression (CC) plus standard mouth-to-mouth resuscitation (MMR) to the heart attack patient until the emergency response team arrived. However, some researchers believed that CC alone would be a more effective approach.

   In the 1990s a study was conducted in Seattle in which 518 cases were randomly assigned to treatments: 278 to CC plus standard MMR and 240 to CC alone. A total of 64 patients survived the heart attack: 29 in the group receiving CC plus standard MMR, and 35 in the group receiving CC alone. A test of significance was conducted on the following hypotheses.

   H_0: The survival rates for the two treatments are equal.

   H_a: The treatment that uses CC alone produces a higher survival rate.

   This test resulted in a p-value of 0.0761.

   (a) Interpret what this p-value measures in the context of this study.

   (b) Based on this p-value and study design, what conclusion should be drawn in the context of this study? Use a significance level of $\alpha = 0.05$.

   (c) Based on your conclusion in part (b), which type of error, Type I or Type II, could have been made? What is one potential consequence of this error?

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