1. The Electric Company claims that the average utility bill in a certain neighborhood during October averages about $125. But a sampling of 300 households gave \( \bar{x} = $126.2 \) with \( s = $14.8 \).

Is there evidence, with level of significance \( \alpha = 0.05 \), to conclude that the mean utility bill in October in this neighborhood differs from $125?

(a) State the null hypothesis and a one-sided alternative, and explain what test to use.

(b) For a 0.05 level of significance, what endpoint gives the bound for rejecting the null hypothesis? State the distribution curve used. What about if \( \alpha = 0.025 \)?

(c) Use the \( P \)-value to explain your conclusion for \( \alpha = 0.05 \).

(d) Show how to find the test statistic used for the test in Part (a). Explain the conclusion for \( \alpha = 0.05 \) in terms of the test statistic.
2. In a more upscale neighborhood, the Electric Company claims that the average monthly bill during October is $200. A sample of 250 households gave $\bar{x} = $196.5 with $s = $18.4.

Is there significant evidence to conclude that the mean utility bill in October in this neighborhood differs from $200?

(a) State the null hypothesis and a one-sided alternative, and explain what test to use.

(b) For a 0.05 level of significance, what endpoint gives the bound for rejecting the null hypothesis? State the distribution curve used. What about if $\alpha = 0.025$?

(c) Use the $P$-value to explain your conclusion using $\alpha = 0.025$.

(d) Show how to find the test statistic used for the test in Part (a). Explain the conclusion for $\alpha = 0.025$ in terms of the test statistic.