The manufacturer of a certain engine treatment claims that if you add their product to your engine, it will be protected from excessive wear. An infomercial claims that a woman drove 3 hours without oil, thanks to the engine treatment. A magazine tested engines in which they added the treatment to the motor oil, ran the engines, drained the oil, and then determined the time until the engines seized. Complete parts (a) and (b) below.

(a) Determine the null and alternative hypotheses that the magazine will test.

H_0: [▼] [▼] 3

H_1: [▼] [▼] 3

(b) Both engines took exactly 18 minutes to seize. What conclusion might the magazine make based on this evidence?

○A. The infomercial's claim is true.

○B. The infomercial's claim is not true.

σ	$\neq$
μ	$<$
p	$>$
	$=$

Those are the possible answers for part a

#6

Real estate taxes are used to fund local education institutions, police protection, libraries, and other local public services. A household's real estate tax bill is based on the value of the house. In a recent year, the mean real estate tax bill per $1,000 assessed value for all households in a certain country was $8.62. A random sample of 50 rural households results in a sample mean real estate bill per $1,000 assessed value of $6.04 with a standard deviation of $5.95. Use the level of significance $\alpha = 0.05$. Complete parts (a) and (b).

(a) Based on the histogram and boxplot shown, why is a large sample necessary to conduct a hypothesis test about the mean?

Click the icon to view the graphs.

- A. The real estate tax bill distribution is roughly normal with outliers.
- B. The real estate tax bill distribution is skewed right with outliers.
- C. The real estate tax bill distribution is a uniform distribution.
- D. The real estate tax bill distribution is skewed left with outliers.

(b) Conduct a hypothesis test using the P-value approach and a level of significance of $\alpha = 0.05$ to determine if the evidence suggests the mean real estate bill for rural households per $1,000 assessed value differs from that of all households.

Choose the correct hypotheses.

H_0: [ ] [ ] 8.62

H_1: [ ] [ ] 8.62

#9

Find the test statistic.

$t_0 =$ [ ]

(Round to two decimal places as needed.)

Find the P-value.

The P-value is [ ].

(Round to three decimal places as needed.)

Use the level of significance $\alpha = 0.05$. What can be concluded from the hypothesis test?

- A. The evidence suggests that rural households have a lower mean real estate tax bill.
- B. The evidence suggests that rural households have a different mean real estate tax bill.