AP Stats

9.3 Tests about a Population Mean

Are you getting enough sleep?

It’s recommended that teenagers get 8 hours of sleep a night. Ms. Carder believes her AP Stats students are getting less than the recommended 8 hours of sleep per night. To test her belief, we will record the number of hours of sleep each of you got. Do these data provide convincing evidence that the AP stats students get less than 8 hours of sleep per night using \( \alpha = 0.05 \)?

1. Calculate the sample mean and standard deviation.

2. State the appropriate hypotheses for a significance test. Be sure to define the parameter of interest.

3. What conditions must be met? Check them.

4. Give the formulas for the mean and standard deviation of the sampling distribution of \( \bar{x} \) and calculate the values.

5. Draw a picture and then calculate the test statistic.

6. Remember, since we are working with means, the test statistic is a \( t \) value. Use table B to find the P-value.

7. What conclusion can we make?
Check Your Understanding

The level of dissolved oxygen (DO) in a stream or river is an important indicator of the water’s ability to support aquatic life. A researcher measures the DO level at 30 randomly chosen locations along a stream. Here are the results in milligrams per liter (mg/l): $\bar{x} = 4.77$ and $s_x = 0.939$. An average dissolved oxygen level below 5 mg/l puts aquatic life at risk. Do the data provide convincing evidence at the $\alpha = 0.05$ significance level that aquatic life in this stream is at risk?

State: Parameter:

Hypotheses: $\mu = 5$

Statistic: $\bar{x} = 4.77$

$\alpha$ Level: 0.05

Plan: Name of procedure:

Check conditions:

Do: General: Picture:

Specific:

Work: Test Statistic:

P-value:

Conclude: