

Answer on Question #54036 – Math – Statistics and Probability

Test $H_0: \mu \leq 8$ versus $H_a: \mu > 8$, given $\alpha = 0.01$, $n = 25$, $\bar{x} = 8.13$ and $s = 0.25$. Assume the sample is selected from a normally distributed population.

Solution

$$H_0: \mu \leq 8 \quad H_a: \mu > 8$$

The test statistic is

$$t = \frac{\bar{x} - 8}{\frac{s}{\sqrt{n}}} = \frac{8.13 - 8}{\frac{0.25}{\sqrt{25}}} = 2.6.$$

The critical value for $\alpha = 0.01$ significance level and $25 - 1 = 24$ degrees of freedom is

$$t_{cr} = 2.492.$$

Because $t = 2.6 > t_{cr} = 2.492$ we reject the null hypothesis. There is a sufficient evidence to conclude that $\mu > 8$.