

Answer on Question #48249 – Math – Statistics and Probability

An automobile manufacturer claims that its van has a 26.3 miles/gallon rating. After testing 250 vans, they found a mean mpg of 26.7. Assume a population variance of 6.76. A level of significance of 0.1 will be used. Is there sufficient evidence at the 0.1 level that the vans have an incorrect manufacturer's mpg rating.

Solution

$$H_0: \mu = 26.3; H_a: \mu \neq 26.3.$$

$$z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{26.7 - 26.3}{\frac{\sqrt{6.76}}{\sqrt{250}}} = 2.43.$$

We reject H_0 at the 0.1 significance level because $z = 2.43 > \frac{z_{\alpha}}{2} = z_{0.05} = 1.645$. The vans have an incorrect manufacturer's mpg rating.