

Answer on Question #83737 – Math – Statistics and Probability

Question

A shipping firm suspects that the mean life of a certain brand of tire used by its trucks is more than 37,000 miles. To check the claim, the firm randomly selects and tests 18 of these tires and gets a mean lifetime of 37,700 miles with a standard deviation of 1200 miles. Assume the distribution is normal. At $\alpha = 0.05$, test the shipping firm's claim. State the hypotheses:

Solution

One sample t-test.

Null hypothesis $H_0: \mu = 37000$.

Alternative hypothesis $H_a: \mu > 37000$.

Test statistic: $t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}} = \frac{37700 - 37000}{\frac{1200}{\sqrt{18}}} = 2.47$.

Degrees of freedom: $df = 18 - 1 = 17$.

P-value: $p = 0.0122$.

Since the P-value is less than 0.05 we should reject the null hypothesis and conclude that there is a sufficient evidence that mean life of a certain brand of tire used by its trucks is more than 37,000 miles.