Answer on Question #86254 – Math – Statistics and Probability

Question

A random sample of 10 males from a normal population showed a mean height 66 inches and the sum of squares from this mean is equal to 90 sq inches. Is it reasonable to believe that the average height is greater than 64 inches? Justify your answer.

Solution

Right-tailed One-sample t-test.

Null hypothesis H_0: $\mu = 64$.

Alternative hypothesis H_a: $\mu > 64$.

Sample standard deviation: $s = \sqrt{\dfrac{SS}{n-1}} = \sqrt{\dfrac{90}{9}} = \sqrt{10}$.

Test statistic: $t = \dfrac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}} = \dfrac{66-64}{\frac{\sqrt{10}}{\sqrt{10}}} = 2$.

Degrees of freedom: $df = n - 1 = 10 - 1 = 9$.

P-value: $p = 0.0383$.

Since the P-value is less than 0.05 we must reject the null hypothesis.

It is reasonable to believe that the average height is greater than 64 inches.