

Answer on Question #84192 – 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

One-tailed test:

H_0 - the average height $a \leq 64$

H_1 - the average height $a > 64$ (researcher's claim)

Find the statistic for t-criterion:

$$t = \frac{\bar{X} - a}{\frac{\sqrt{s^2}}{\sqrt{n-1}\sqrt{n}}} = \frac{66 - 64}{\frac{\sqrt{90}}{\sqrt{9 \cdot 10}}} = 2$$

Find the p-value:

$$P_{a=64}(t > 2) = T_{n-1}(2) = 0.0382$$

Since p-value is rather small (at least less than the usual critical level $\alpha = 0.05$) we reject the null hypothesis and accept the researcher's claim. The answer is yes, it is reasonable that the average height is greater than 64 inches.