

### Answer on Question #54877 – Math – Statistics and Probability

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

#### Solution

The standard deviation is

$$s = \sqrt{\frac{SSX}{n-1}} = \sqrt{\frac{90}{10-1}} = \sqrt{10}.$$

$$\begin{aligned} P(\mu > 64) &= P\left(z > \frac{64 - \bar{x}}{\frac{s}{\sqrt{n}}}\right) = P\left(z > \frac{64 - 66}{\frac{\sqrt{10}}{\sqrt{10}}}\right) = P(z > -2) = 1 - P(z < -2) = 1 - 0.0228 \\ &= 0.9772. \end{aligned}$$

It is reasonable to believe that the average height is greater than 64 inches, because the chance of this event is 97.72%.