Answer on Question#36994 – Math – Statistics and Probability

A statistician wishes to test the claim that the standard deviation of the weights of firemen is greater than 25 pounds. To do so, she selected a random sample of 20 firemen and found s = 27.2 pounds.

Assuming that the weights of firemen are normally distributed, to test her research hypothesis the statistician would use a chi-square test. In that case, what is the computed test value?

Solution

Let's calculate the chi square statistic:

$$\chi^2 = \frac{(O-E)^2}{E},$$

where O – observed standard deviation, E - expected standard deviation.

So

$$\chi^2 = \frac{(27.2-25)^2}{25} = 0.1936.$$

Our degrees of freedom (df) are sample sizes minus 1:

$$df = 20 - 1 = 19.$$

Then we use Chi Square distribution table.

Checking the table of critical values of the chi-square distribution for 19 degrees of freedom, we find that p =1.0.

Answer: 1.0.