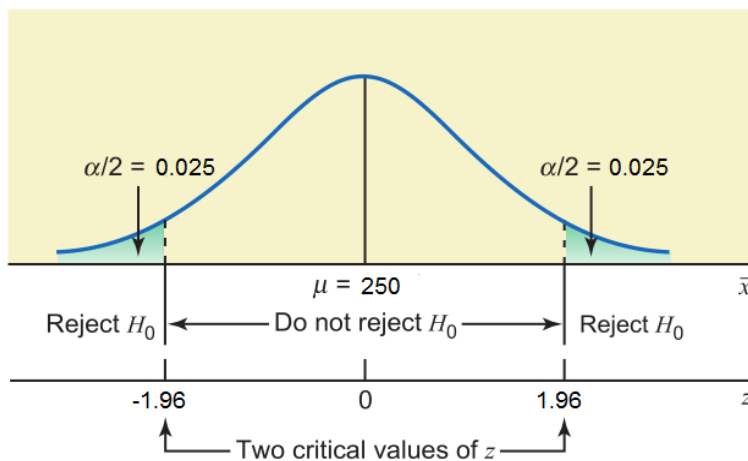# Answer on Question #81872 – Math – Statistics and Probability

## Question

It is claimed that the average weight of a bag of biscuits is 250 grams with the standard deviation 20.5 grams. Would you agree to this claim if random sample of 50 bags of biscuits showed an average weight of 240 grams, using a 0.05 level of significance?

## Solution

Let the null hypothesis be $H_0: \mu = 250$. Let the alternative hypothesis be $H_1: \mu \neq 250$. Assume that the population standard deviation is $\sigma = 20.5$.

The population standard deviation is known and the sample size $n$ is large ($n \geq 30$).

Hence, the test statistic is $z = \dfrac{\bar{x}-\mu}{\sigma/\sqrt{n}}$, and the value is $z = \dfrac{\bar{x}-\mu}{\sigma/\sqrt{n}} = \dfrac{240-255}{20.5/\sqrt{50}} = -5.174$.

The test is two tailed (because $H_1$ contains inequality $\neq$ ) and the critical values are $z_{-0.025} = -1.96$ and $z_{0.025} = 1.96$. Since $z < -z_{0.025}$, i.e. the $z$ lies to the left of the critical value, we reject the null hypothesis.



We would not agree with a claim, the true average weight of a bag of biscuits is not 250 grams.

**Answer:** the true average weight of a bag of biscuits is not 250 grams.