

1.6 A laboratory analyzed the potency of 145 aspirin tablets selected at random of a particular brand. The label on the bottle states that each tablet contains 5 grains of aspirin. For the sample, the average strength was 5.03 grains and the standard deviation was 0.24 grains. Do the sample results indicate that the mean potency of this brand is not 5 grains? Test at the 5 percent significance level and include the P-Value and a one sentence statement in your conclusion. Should this brand be taken off the shelf because it is mis-labeled? Explain.

$$H_0 : \mu = 5$$

$$H_1 : \mu \neq 5$$

Claim is H_1

$$\alpha = 0.05$$

Sample Data

$$n = 145$$

$$\bar{x} = 5.03$$

$$s = 0.24$$

Test Statistic

$$t = \frac{\bar{x} - \mu_{\bar{x}}}{\frac{s}{\sqrt{n}}} \quad t = \frac{5.03 - 5}{\frac{0.24}{\sqrt{145}}} \approx \boxed{1.505} \quad \text{P-Value} \approx \boxed{0.134}$$

Since the P-Value > Alpha, we $\boxed{\text{Fail to Reject } H_0}$

There is not sufficient evidence to support the claim that the mean potency of this brand is not 5 grains.

No, this brand should not be taken off the shelf. The sample mean of 5.03 grains is normal sample variation. There is no evidence against the null.