Answer on Question #43661-Math-Statistics and Probability

8023 offspring peas were obtained, and 24.94% of them had green flowers. The others had white flowers. Consider a hypothesis test that uses a $\alpha = 0.05$ significance level to test the claim that green flowered peas occur at a rate of 25%.

What is the test statistic?

Solution

$$z = \frac{\hat{p} - p}{\sqrt{\dfrac{pq}{n}}} = \frac{0.2494 - 0.25}{\sqrt{\dfrac{0.25 \cdot 0.75}{8023}}} = -0.124.$$

What is the critical value?

Solution

$H_0 : p = 0.25.$

$H_1 : p \neq 0.25.$

Two-tailed test.

$$z_{\alpha/2} = z_{0.025} = \pm 1.96.$$

What is the p value?

Solution

p-value for $z = -0.124$ is $0.9014 > \alpha = 0.05$.

What is the conclusion?

Solution

Fail to reject H_0; there is not sufficient evidence to reject that $p = 0.25$.

Can a hypothesis test be used to prove that the rate of green flowered peas is 25%, as claimed?

Solution

No. A hypothesis test will either "reject" or "fail to reject" a claim that a population parameter is equal to a specified value.