Concluding a Test for a Population Proportion Quiz

1. A company that ships glass for a glass manufacturer claimed that its shipping boxes are constructed so that no more than 8 percent of the boxes arrive with broken glass. The glass manufacturer believed the actual percent is greater than 8 percent. The manufacturer selected a random sample of boxes and recorded the proportion of boxes that arrived with broken glass. The manufacturer tested the hypotheses $H_0 : p = 0.08$ versus $H_a : p > 0.08$ at the significance level of $\alpha = 0.01$. The test yielded a p-value of 0.001. Assuming all conditions for inference were met, which of the following is the correct conclusion?

(A) The p-value is greater than α, and the null hypothesis is rejected. There is convincing evidence that the proportion of all boxes that contain broken glass is greater than 0.08.

(B) The p-value is greater than α, and the null hypothesis is rejected. There is not convincing evidence that the proportion of all boxes that contain broken glass is greater than 0.08.

(C) The p-value is greater than α, and the null hypothesis is not rejected. There is not convincing evidence that the proportion of all boxes that contain broken glass is greater than 0.08.

(D) The p-value is less than α, and the null hypothesis is rejected. There is convincing evidence that the proportion of all boxes that contain broken glass is greater than 0.08.

(E) The p-value is less than α, and the null hypothesis is not rejected. There is not convincing evidence that the proportion of all boxes that contain broken glass is greater than 0.08.

2. The plant manager of a company that makes pillows claims that only 8 percent of the pillows made have a stitching defect. The quality control director thought that the percent might be different from 8 percent and selected a random sample of pillows to test. The director tested the hypotheses $H_0 : p = 0.08$ versus $H_a : p \neq 0.08$ at the significance level of $\alpha = 0.05$. The p-value of the test was 0.03. Assuming all conditions for inference were met, which of the following is the correct conclusion?

(A) The p-value is less than α, and the null hypothesis is rejected. There is convincing evidence to suggest the true proportion of stitching defects is less than 0.08.

(B) The p-value is less than α, and the null hypothesis is rejected. There is convincing evidence to suggest the true proportion of stitching defects is not 0.08.

(C) The p-value is less than α, and the null hypothesis is rejected. There is convincing evidence to suggest the true proportion of stitching defects is greater than 0.08.

(D) The p-value is less than α, and the null hypothesis is not rejected. There is convincing evidence to suggest the true proportion of stitching defects is not 0.08.

(E) The p-value is less than α, and the null hypothesis is not rejected. There is not convincing evidence to suggest the true proportion of stitching defects is not 0.08.

3. A marketing agency selected a random sample of television viewers to test the claim that the proportion of viewers who watch a particular show is less than 0.20 at a level of significance of 0.05. The test yielded a p-value of 0.47. Assuming all conditions for inference were met, which of the following is the correct conclusion?

(A) At the level of significance of 0.05, the null hypothesis is not rejected. There is not convincing evidence to suggest the true proportion of television viewers who watch the show is less than 0.20.

(B) At the level of significance of 0.05, the null hypothesis is not rejected. There is convincing evidence to suggest the true proportion of television viewers who watch the show is less than 0.20.

(C) At the level of significance of 0.05, the null hypothesis is rejected. There is convincing evidence to suggest that the true proportion of television viewers who watch the show is less than 0.20.

(D) At the level of significance of 0.05, the null hypothesis is rejected. There is not convincing evidence to suggest that the true proportion of television viewers who watch the show is greater than 0.20.

(E) At the level of significance of 0.05, the null hypothesis is rejected. There is convincing evidence to conclude that the null hypothesis is true.