

A car company believes that the percentage of residents in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this. He conducts a hypothesis testing surveying 250 residents and found that 170 responded yes to owning a vehicle.

a) State the Null & Alternate Hypothesis.

b) At 10% significance level, is there enough evidence to support the idea that vehicle owned in city ABC is 60% (or) less

$$P_0 = 60\%, \quad n = 250, \quad x = 170, \quad \alpha = 10\%$$

1.  $H_0: P_0 \leq 60\%$

one-tail, Z-test

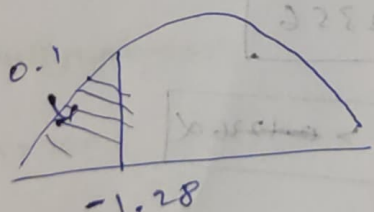
$H_1: P_0 > 60\%$

$$\hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$$

$$Q_0 = 1 - P_0 = 1 - 0.6 = 0.4$$

2.  $\alpha = 0.1$

3. Condition Boundary



4. Z-test with Proportion :-

$$\begin{aligned} Z\text{-test} &= \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 Q_0}{n}}} \\ &= \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} \end{aligned}$$

$$\boxed{Z\text{-test} = 2.582}$$

$$2.582 > -1.28$$

Accept the Null Hypothesis.

The % of resident owns a vehicle is 60% or less