Q. A car company believes that the % 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 & 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 ownership in city ABC is 60% or less?

Ans: $H_0 = P_0 \leq 60\%$

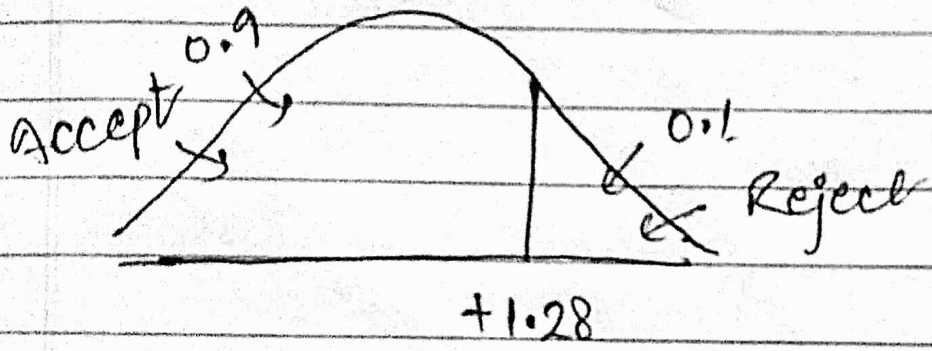
$H_1 = P_0 > 60\%$

$q_0 = 1 - P_0 = 1 - 0.6 = 0.4$

$n = 250 \quad x = 170$

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

$\alpha = 0.1 \quad C.I = 0.9$ (one-tail test)



Z-test with proportion

$$Z = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}} = 2.58$$

$2.58 > 1.28$ Reject the H_0.