Assignment No. 6

A car company believes that the percentage of residents in city ABC that own a vehicle is 60% or less. A sales manager disagrees with this. He conduct 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 ownership in city ABC is 60% or less?

⇒ $H_0 = P_0 \leq 60\%$

$H_1 = P_0 > 60\%$

Given : $n = 250$, $x = 170$

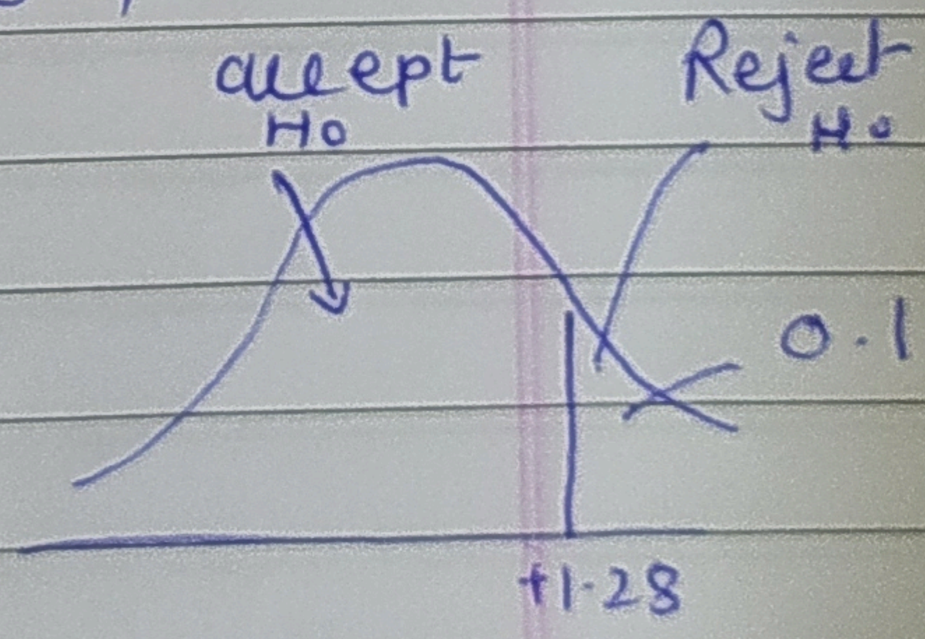
$\hat{p} = \frac{x}{n} = \frac{170}{250} = 0.68$

$q_0 = 1 - p_0 = 1 - 0.6 = 0.4$

$\alpha = 0.1$, C.I = 90%

~~Calculate~~ $1 - 0.1 = 0.9$

value from z table = ± 1.28



As $n > 30$ use z test.

Z test with proportion = $\frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}}$

$= \frac{0.08}{\sqrt{0.00096}} = \frac{0.08}{0.03098} = 2.582$

Z score value > +1.28 i.e 2.582 > 1.28

so Reject Null hypothesis. i.e vehicle ownership in city ABC is > 60.