* A car company belives that the percentage of residents in city ABC that was 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 ownership in city ABC is 60% or less?

a) $h_0 = P_0 = 60\%$

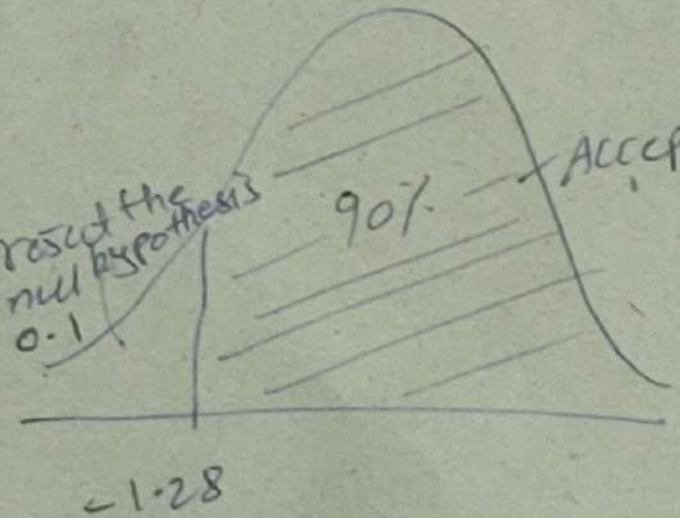
$h_1 = P_0 \neq 60\%$

$n = 250 \quad x = 170$

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

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

$\alpha = 0.1$



2 test with proportion

$$z\text{test} = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$= \frac{0.08}{\sqrt{\frac{0.24}{250}}} = \frac{0.08}{\sqrt{0.00096}}$$

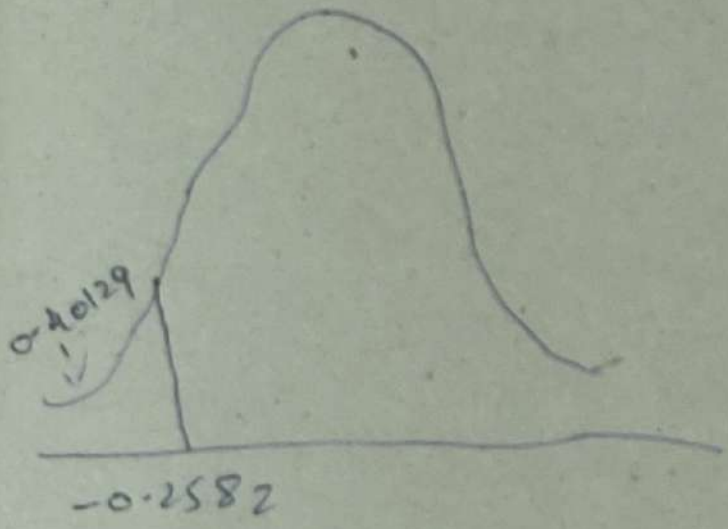
$$= \frac{0.08}{0.3098} = 0.2582$$

$-1.28 < 0.258$

Accept the null hypothesis

P-value:-

z test $= 0.258$



$1 - 0.40129$

$= 0.59871$

$\alpha = 0.1$

pvalue $= 0.40129$

$\alpha < p\text{-value}$

Accept the null hypothesis.