8. A car company believed that the percentage of residents in city ABC that owns a vehical is 60% or less. A sales managh disagrees with this he conducts a hypothesis testing survey 250 residents and found that 170 respondend yes to owning a vehical

(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.

Sol

Null Hypothesis : $H_0 \leq 60\%$

Alternate hypothesis : $H_1 > 60\%$

one tail test

$n = 250 \qquad x = 170$

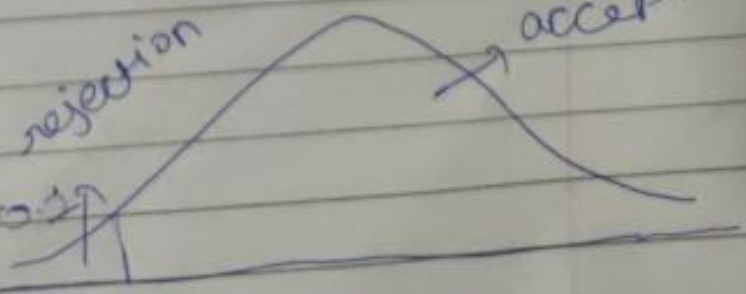
$$\hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$$

$q_0 = 1 - P_0$

$= 1 - 0.6$

$= 0.4$

$\alpha = 0.1$



z test with proportion

$$z\text{ test} = \frac{\hat{p} - p_0}{\sqrt{\frac{q_0 p_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\frac{0.4 \times 0.6}{250}}}$$

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

$$= \frac{0.08}{0.0309}$$

$$= 2.588$$

null hypothesis can be accepted

Thus

vehical ownership in the city is 60% or less