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

a) State the null & Alternate hypothesis

b) At a 10%. Significance level, is there enough evidence to support that idea that vehicle owners in ABC city is 60% or less.

Ans:-

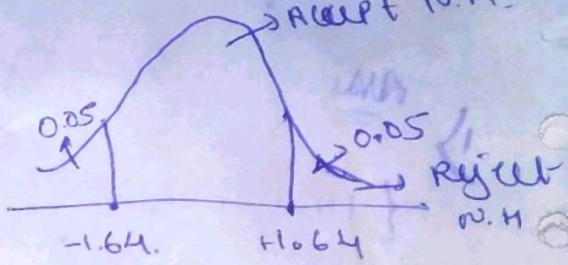
null Hypothesis $H_0: P_0 = 60\%$.
$H_1: P_0 \neq 60$

$n = 250 \quad x = 170$

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

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

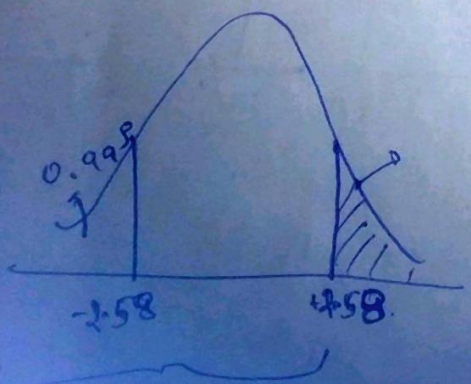
$\alpha = 0.10$



$$Z_{test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$Z_{test} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 * 0.4}{250}}} = 2.58$$

$2.58 > +1.64$ {So Reject null hypothesis}



0.00494

$1 - 0.00494 = 0.99506$

P-value $= 0.99506 + 0.99506$

$= 1.99012$

0.00494.

Pvalue > Significance value

$1.99012 > 0.1$

So accept the null hypothesis