Que 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 & 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 the idea that vehicle owner in ABC city is 60% or less

Q.3

H_0 : $P_0 \leq 60\%$ [Here we use One-tailed Test
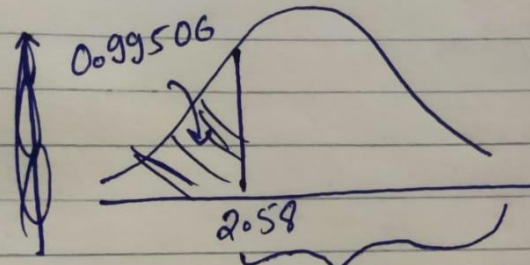H_1 : $P_0 \neq 60\%$ (left - One tailed test)]

So Here $x = 170$, $n = 250$ So we will do Z test as $n \geq 250$

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

$$P_0 = 60\% = 0.6\cancel{0}$$

$$q_0 = 1 - 0.6 = 0.4$$

$$\underline{q = 0.4}$$

$$\alpha = 10\%$$
$$= 0.1$$

No using test Statistic = $\dfrac{\hat{p}-p_0}{\sqrt{\dfrac{p_0 \times q_0}{n}}}$ = $\dfrac{0.68-0.6}{\sqrt{\dfrac{0.6 \times 0.4}{250}}}$ = 2.58

pvalue

0.99506

2.58

pvalue = 1 - 0.99506
       = 0.00494

pvalue < α   [We reject Null hypothesis]
As α = 0.1