

Q → A car company believes that percentage of residents in city ABC that own 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 vehicles.

- state the Null & alternate hypothesis
- At 10% significance level, is there enough evidence to support the idea that vehicle ownership in city ABC is 60% or less.

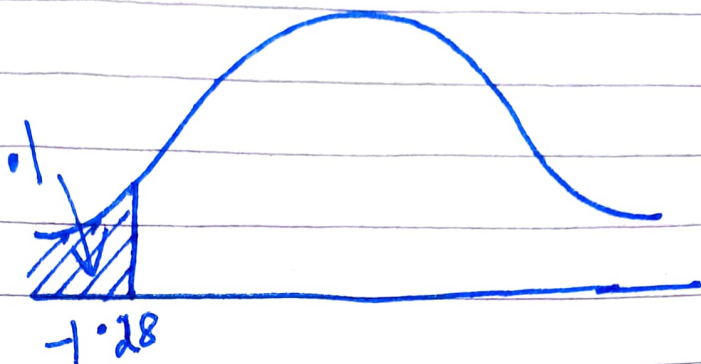
Sol<sup>n</sup> →  $P_0 = 60\%$        $Q_0 = 1 - 0.6 = 0.4$

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

where  $n = 250$

$$P_0 \leq 60\%$$

$$P_0 \neq 60\% \text{ or } P_0 > 60\%$$



⊗ Condition Boundary

$$\alpha = 10\%$$

$$\begin{aligned} C.I &= 1 - 0.10 \\ &= 0.90 = 90\% \end{aligned}$$

$$\boxed{\alpha = 0.1}$$

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

$$= \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$= \frac{0.08}{\sqrt{0.00096}} = \frac{0.08}{0.0309}$$

$$\boxed{Z\text{-test} = 2.588} \quad \text{---} \otimes$$

Ans → There is enough evidence to support the idea that vehicle ownership in city ABC is 60% or less.

→ Thus Null Hypothesis Accepted.