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Q3 A car believes that the percentage of citizens in city ABC that owns a vechile is 60% or less. A sales manager disagree with this. He conducted a hypothesis testing surveying 250 residents & found that 170 residents responded yes to owning a vechile.

a) State the null & alternate hypothesis.
b) At a 10% significance level, is there enough evidence to support the idea that vechile owners in ABC city is 60% or less.

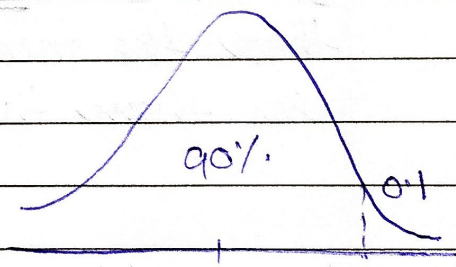
Null hypothesis $H_0: P_0 \leq 60$

$H_1: P_0 > 60$

$n = 250 \qquad x = 170$

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

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



$\alpha = 0.1 \quad , \quad 1 - 0.1 = 0.90$

$Z_{0.1} = 1.28$

$$Z_{test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{\sqrt{\frac{0.24}{250}}} = \frac{0.08}{\sqrt{0.00096}} = \frac{0.08}{0.0309}$$

$2.666 > 1.28$ (Reject the null hypothesis.)