HYPOTHESIS TEST SUMMARY: z TEST FOR A POPULATION MEAN (SAT Verbal Scores)

Research Problem:
Does the mean SAT verbal score for all local freshmen differ from the national average of 500?

Statistical Hypotheses:
\[ H_0: \mu = 500 \]
\[ H_1: \mu \neq 500 \]

Decision Rule:
Reject \( H_0 \) at the .05 level of significance if \( z \) equals or is more positive than 1.96 or if \( z \) equals or is more negative than \(-1.96\).

Calculations:
Given
\[ \bar{X} = 533; \mu_{\text{hyp}} = 500; \sigma = \frac{110}{\sqrt{100}} = 11 \]
\[ z = \frac{533 - 500}{11} = 3 \]

Decision:
Reject \( H_0 \) at the .05 level of significance because \( z = 3 \), which is more positive than 1.96.

Interpretation:
The mean SAT verbal score for all local freshmen does not equal — it exceeds — the national average of 500.