Mrs. Daniel - AP Stats
10.1 #2 WS Solutions

Parameter:
\( p_1 \) = the true quitting rate for employees like these who get a financial incentive to quit smoking
\( p_2 \) = the true quitting rate for employees like these who don’t get a financial incentive to quit smoking.

Hypothesis:
\( H_0 : p_1 = p_2 \)
\( H_a : p_1 > p_2 \)

Assess Conditions:
- Random: The treatments were randomly assigned.
- Normal: \( n_1 \hat{p}_1 = 66, \ n_1 (1 - \hat{p}_1) = 373, \ n_2 \hat{p}_2 = 22, \ n_2 (1 - \hat{p}_2) = 417 \) are all at least 10.
- Independent: The random assignment allows us to view these two groups as independent. We must assume that each employee’s decision to quit is independent of other employee’s decisions.

Name Test: two-sample z test for \( p_1 - p_2 \)

Test Statistic: \( \hat{p}_C = \frac{66 + 22}{439 + 439} = 0.100, \ z = \frac{(0.15 - 0.05) - 0}{\sqrt{\frac{0.1(1 - 0.1)}{439} + \frac{0.1(1 - 0.1)}{439}}} = 4.94, \)

Obtain P-value: p-value \( \approx 0 \)

Make a Decision: Since the \( P \)-value is practically zero, which is less than 0.05, we reject \( H_0 \).

State Conclusion in Context: We have convincing evidence that financial incentives help employees like these quit smoking.