

Chapter 8 Review Problems

1. A paper randomly surveys 200 readers and finds that 120 favor a given candidate. Test the claim at 5% significance that the candidate has a 67% proportion against the alternative that this is not true.

→ Parameter: population proportion

→ Hypotheses: $H_0: p = 0.67$, $H_1: p \neq 0.67$ ($q = 1 - p = 0.33$)

→ Gather: $\hat{p} = \frac{x}{n} = \frac{120}{200} = 0.60$, $n = 200$, $\alpha = .05$

→ Requirements: $np = 200(0.67) = 134 \geq 10$, $nq = 200(0.33) = 66 \geq 10$ ✓

→ Test Statistic: $z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}} = \frac{.60 - .67}{\sqrt{\frac{.67 \cdot .33}{200}}} = \frac{-2.11}{\text{Std. errors}} = -2.11$ statistically significant

→ Critical Values:

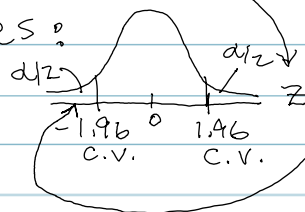


Table A2

df
 $\downarrow$
 Bottom Row (z) $\rightarrow$ 1.96
 $\alpha = .05$
 2-tail

→ P-value (2-tail $\rightarrow$ use |T.S.|)

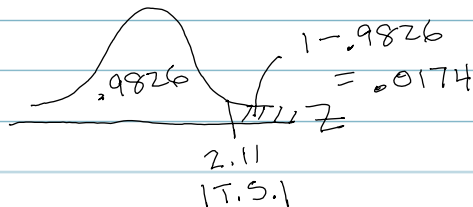


Table A1

z $\rightarrow$.01
 $\downarrow$
 2.1 $\rightarrow$.9826

$$P\text{-val} = 2 \cdot 0.0174 = 0.0348 \leftarrow \text{Significant}$$

$$\rightarrow P\text{-val} = .0348 < .05 = \alpha$$

→ Conclusion: Reject H_0 & Support H_1 .

The data do not support the claim that the candidate has 67% of the vote.