

Name: Solutions

Math 130

Quiz 14

Date: 4/21/2025

A formula you may need: $z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}}$

1. (10 points) A researcher claims that 24% of adults in the United States are afraid to fly. You want to test this claim. You find that in a random sample of 1075 adults in the United States, 292 are afraid to fly. At the 0.05 significance level, can you reject the researcher's claim? (Use the p-value method)

Hyp. Test

$$H_0: p = 24\%$$

$$H_1: p \neq 24\%$$

p = The percentage of all adults in the United States that are afraid to fly.

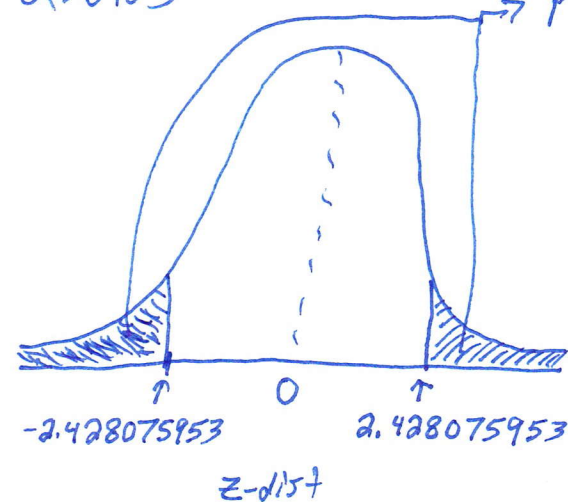
Test stat

$$n = 1075 \quad x = 292 \quad \hat{p} = \frac{x}{n} = \frac{292}{1075}$$

$$Z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}} = \frac{\frac{292}{1075} - 0.24}{\sqrt{\frac{(0.24)(0.76)}{1075}}} = 2.428075953$$

P-value

$$\alpha = 0.05$$



$$p\text{-value} = P(Z < -2.428075953) + P(Z > 2.428075953)$$

$$= 0.0151791623$$

Is $p\text{-value} < \alpha$?

$0.0151791623 < 0.05$? Yes!

Conclusion Reject H_0 !

Evidence suggests that the percentage of all adults in the United States that are afraid to fly is not 24%.