

Instructions: Show all work to receive full credit. You should note any formulas used or calculator functions used, their inputs and outputs. I cannot grade work if I don't know where an answer came from. Be sure complete all parts of each questions, including requests for interpretation and explanations. Be as thorough as possible.

1. We want to determine if a coin is fair. So we flip the coin 500 times and find that 237 times the coin came up heads. Is this good reason to think that the coin is not fair?

$$H_0: p = .5 \quad (\text{PropZTest})$$

$$H_a: p \neq .5$$

$$p_0 = .5$$

$$x = 237$$

$$n = 500$$

$$\text{prop} \neq p_0$$

$$z = -1.16$$

$$p = .2449 > .05$$

fail to reject H_0

no, this is not strong evidence
to think the coin is not
fair.

2. Bon Air Elementary School has 1000 students. The principal of the school thinks that the average IQ of students at Bon Air is at least 110. To prove her point, she administers an IQ test to 20 randomly selected students. Among the sampled students, the average IQ is 108 with a standard deviation of 10. Based on these results, should the principal accept or reject her original hypothesis? Assume a significance level of 0.01. (Assume that test scores in the population of engines are normally distributed.)

$$H_0: \mu = 110$$

$$H_a: \mu \neq 110$$

T-Test (Stats)

$$\mu_0 = 110$$

$$\bar{x} = 108$$

$$s_x = 10$$

$$n = 20$$

$$\mu \neq \mu_0$$

$$z = -.894$$

$$p = .3822 > .05$$

fail to reject H_0

this is not strong evidence
to think her previous
assumption was false