Suggested solutions to review questions Test-3 STA 2023

1) ME = 1.61%

 We are 90% confident that the percent of American adults who approve cloning endangered animals is within 1.61% away from 89%.

2) \*\*\* Since there are other problems dealing with testing hypotheses, we will approach this problem using confidence interval. (using 95% confidence level)

CI for p = .52 ± 1.960 \* .0158 = (.489, .551).

We cannot be 95% confident that the mayor will get more than 50% of the votes: the 95% confident interval for the population includes some values smaller than 50%.

3) $H\_{0}:p=.03$ p= Proportion of a certain model of trucks that need a new

 engine after being driven between 0 and 100 miles.

 $H\_{a}:p<.03$

4) There is 2% chance that a fair die could randomly produce the result we observed, so it’s reasonable to conclude that the die is loaded.

5) $H\_{0}:p=0.40$ P = Proportion of current readers who would subscribe to the

 online edition.

 $H\_{a}:p>.40$

P-value = ncdf ( .4067, 10, .4, 0.0126) = .2876

Since there is no confidence level specified, we use α = 0.05

p-value > α , We cannot reject $H\_{0}$, therefore we cannot accept $H\_{a}$

At 5% significant level, we do not have enough evidence to conclude that more than 40% of current readers would subscribe for the online edition.

6) CI for p = .55 ± 1.960 \* .0064 = (.5375, .5625)

We are 95% confident that the percent of people who had never been smokers in 2004 is between 53.75% and 56.25%.

7) $H\_{0}:p=0.38$ P = Proportion of math majors who would dropout after their

 freshmen year, with the easier curriculum.

 $H\_{a}:p<.38$

P-value = ncdf ( 0, .2850, .38, 0.0337) = .0024

Since there is no confidence level specified, we use α = 0.05

p-value < α , We reject $H\_{0}$, and accept $H\_{a}$

At 5% significant level, we have enough evidence to conclude that the dropout rate would decrease with the easier curriculum.

Meaning of p-value: The chance of observing 59 or fewer dropouts in a class of 207 is only 0.24% if the dropout rate is really 38%.

8) CI for p = .70 ± 1.960 \* .0648 = (.5730, .8270).

9) 95% of all the calculated confidence intervals will include the true percent of students in the professor’s class who are registered to vote.

10) The 73% figure from the Gallup seems reasonable snice 73% lies in our CI.

11) n = 474