Name: _____

MAT 222
Fall 2019
Homework 6

"[Nick] I can show you around; I can show you our world. Way up here, it's crystal clear. [Jess] Nick, you're doing Aladdin. [Nick] Again?"

–Nick Miller & Jessica Day, New Girl

Problem 1: The Dallas Cowboys (a sports ball team) has made it to the Super Bowl (a big sports ball team event) eight times, tieing for second place in the most number of Super Bowl appearances. As of 2015 at $4 billion, the Dallas Cowboys are the most valued sports team in the world. Since 2010, the Dallas Cowboys (a sports ball team) have won 78 of their 144 games.

(a) Using this data, construct a 90% confidence interval for the win percentage of the Dallas Cowboys. Interpret the results.

(b) What if the coach of the Dallas Cowboys claimed that the team wins 75% of their games? Use the data to test this statement against the hypothesis that the winning percentage is lower than 75% at a significance level of $\alpha = 0.10$. State your conclusions.

(c) Using the data stated in the problem, how many games would you have so sample to estimate the win percentage of the Dallas Cowboys within one percentage point? [Use the same significance level as in the previous parts.]

(d) If no previous data was available to you, how many games would you have so sample to estimate the win percentage of the Dallas Cowboys within one percentage point? [Use the same significance level as in the previous parts.]

(e) Is it true that the margin of error in the confidence interval from (a) covers all sources of error?

(f) What is the name of the p-method you use when there are less than 10 success and 10 failures?

Problem 2: According to a survey by the Hill-HarrisX conduced online in the United States from June 1–2, 2019, 247 of 481 men stated they would support Trump in the 2020 election while 198 of 520 women stated they would support Trump in the 2020 election.[1]

(a) Construct a 99% confidence interval for the difference between male and female support for Trump. Interpret your answer.

[1] https://thehill.com/hilltv/what-americas-thinking/447308-trumps-giant-gender-gap-62-percent-of-women-say-they-are

(b) Test the hypothesis that there is no difference between male and female support for Trump using a significance level of 0.1%. Interpret your answer.

(c) What if there was already evidence suggesting that there was a 5% support difference between men and women for Trump? Is the data consistent with this evidence? Explain.