[#1] A statistics student in a High School was assigned to conduct a survey to determine whether all high school students favored renaming the street in front of the school after their football coach, who was retiring at the end of the year after 20 years at the school. The student conducing the survey was on the football team, so he passed out 50 survey forms to the other players at the next team meeting. Of these 50 players, 88% responded in favor of the name change.

(a) Identify the population

(b) Identify the sample.

(c) What type of sampling was used?

(d) Explain why this sampling method is biased.

(e) Do you think the percentage of all students who favor the name change is greater or less than 88%? Explain your reasoning.

(f) What type of sampling method should they have used and why?

[#2] What percentage of football players have held an opponent when they thought it would not be detected by officials? To find out, league officials will randomly select 80 of the 1600 active NFL players and interview them by text message. Of these 80 players, suppose that 10% admitted that they had held an opponent when they thought it would not be detected.

(a) Explain how you would randomly select 80 players from this population.

(b) Do you think that the percentage of all football players who have held an opponent when they thought it would not be detected is less than, greater than, or about the same as 10%? Explain your reasoning.

[#3] In 2017, Fieldhouse Media surveyed a random sample of 2087 student athletes at colleges and universities in the United States about their use of social media, and 689/2087 = 33.0% said they have posted something online that they later regret.

(a) Do you think that exactly 33.0% of all U.S. collegiate student athletes would agree that they have posted something online that they later regret? Explain your reasoning.

(b) The standard error of the estimated percentage is 1%. Interpret the standard error.

(c) Use the standard error from part (b) to calculate a 95% confidence interval for the percentage of all U.S. collegiate student athletes would agree that they have posted something online that they later regret.

(d) Interpret the confidence interval you constructed in part (c).

(e) Based on the confidence interval from part (c), is there convincing evidence that fewer than one half of all U.S. collegiate student athletes would agree that they have posted something online that they later regret? Explain your reasoning.

(f) Explain how the survey could reduce the margin of error for their estimate.

[#4] In the 2018 WNBA playoffs, Natasha Howard of the Seattle Storm made 51 of her 89 attempted field goals, for a success rate of 57.3%.

(a) Was 57.3% Howard's *PERFORMANCE* or her *ABILITY* to make a field goal? Explain your reasoning.

(b) The approximate standard error of Howard's estimated shooting percentage was 5.3%. Use the standard error to calculate a 95% confidence interval for Howard's *ABILITY* to score points during the 2018 playoffs.

(c) Interpret the confidence interval you constructed in part (b).

(d) Is there convincing evidence that Howard's *ABILITY* to score points was greater than 60% during the 2018 playoffs? Explain your reasoning.

[#5] In the 2018 season, golfer Ariya Jutanugarn led the LPGA in scoring average. In 106 rounds of golf her average score was 69.4 strokes.

(a) Do you think Jutanugarn's *ABILITY* to score was exactly 69.4 strokes during the 2018 season? Explain your reasoning.

(b) The approximate standard error of the estimated mean is 0.25 strokes. Interpret the standard error.

(c) Calculate a 95% confidence interval for Jutanugarn's *ABILITY* to score in the 2018 season.

(d) Interpret the confidence interval you constructed in part (c).

(e) Based on your interval, is it plausible that her *ABILITY* to score was less than 68 strokes during the 2018 season? Explain your reasoning.