

CHAPTER 15 (PART 1) QUIZ **KEY**

Instructions: You must show your work when space is provided, and it must logically lead to your answer to receive any credit for a question. You are allowed to use a non-programmable calculator to perform mathematical operations. You are allowed to use the equation sheet provided with this quiz. No other references are allowed.

1. (2 points) Florida played a key role in recent presidential elections. Voter registration records in February 2014 show that 39% of Florida voters are registered as Democrats and 35% as Republicans. To test a random digit dialing device you plan to use to poll voters for the upcoming Senate elections, you use it to call 250 randomly chosen residential telephones in Florida. Of the registered voters contacted, 34% are registered Democrats. [15.2]

- a. Define what a population parameter is. Circle the underlined numbers in the statement above that are population parameters.

A population parameter is a summary of an entire population. It describes something about every member in the population.

- b. Define what a sample statistic is. Put a square around the underlined numbers in the statement above that are sample statistics.

A sample statistic is a summary of only the sample we have drawn and requires no knowledge of the population parameters. It is meant to estimate the population parameter.

2. (1.5 point) A specific gambling game costs one dollar to play and you have the opportunity to win up to 100 dollars per play. The mean payoff for the population of thousands of bets is $\mu = 70$ cents. After a player's first ten bets, they have won 200 dollars. Feeling particularly lucky, they decide to keep playing. What does the law of large numbers say about the likely, long-run outcome if this player keeps betting? [15.39]

This player must be particularly lucky in his first few plays. The longer he plays, the closer he is going to get to the population mean, which is .70 dollars, or actually losing money (remember, he pays a dollar to play each time—if he only gets back .70 dollars on average, he will lose money in the long run).

3. (1.5 points) A researcher takes 100 samples of size 15, 100 samples of size 20, and 100 samples of size 25 from a population. She calculates the mean for each sample and plots all 300 means together in a histogram. Does this histogram represent (the start of) a sampling distribution? Explain why or why not. [Lecture]

This is not the start of a sampling distribution since we are mixing samples of different sizes. A sampling distribution is only for many, many samples of the same size.

Award partial credit for answers talking about 300 not being enough to be a sampling distribution—we need all possible samples of a given size to make the sampling distribution.