Homework 12 Chapter 20 (Problems 1 to 6)

Due on November 19

Math 125 *Kovitz* Fall 2025

The key problem is problem 2.

1. You are drawing from a large box of red and blue marbles. Fill in the blanks.

   (a) The expected value for the percentage of reds in the _____ equals the percentage of reds in the _____.

   Options: sample, population.

   (b) As the number of draws goes up, the SE for the _____ of reds in the sample goes up but the SE for the _____ of reds goes down.

   Options: number, percentage.

2. In a certain city, there are 300,000 registered voters, of whom 60,000 are Democrats. A survey organization is about to take a simple random sample of 625 registered voters.

   (a) The expected value for the percentage of Democrats in the sample is _____. The SE for the percentage of Democrats in the sample is _____.

   (b) The percentage of Democrats in the sample is likely to be around _____, give or take _____ or so.

   (c) Find the chance that between 19% and 21% of the registered voters in the sample are Democrats.

3. At a large university, 73.2% of the students are female and 26.8% of the students are male. A simple random sample of 1,000 persons is drawn from this population. The SE for the sample percentage of females is figured as 1.4%.

   True or false: There is about a 95% chance for the percentage of females in the sample to be in the range $73.2\% \pm 2.8\%$. Explain.

4. True or false: with a well-designed sample survey, the sample percentage is very likely to equal the population percentage.

5. A simple random sample is drawn _____ replacement.

   Options: with without.

6. A polling organization takes a simple random sample of 625 students from a college with 25,000 students. In the sample, 325 students are for the proposal. Fill in the blanks, using the options below. Explain briefly.

   (a) The observed value of the _____ is 325.

   (b) The observed value of the _____ is 52%.

   (c) The expected value of the _____ is equal to the _____.

   Options:

   (i) number of students in the sample who are for the proposal

   (ii) percentage of students in the sample who are for the proposal

   (iii) percentage of students in the college who are for the proposal