

# Classroom Voting Questions: Elementary Statistics

## The Sampling Distribution of a Sample Mean

1. Jamie randomly selects 25 houses that are for sale in the U.S. The shape of the distribution of their prices is probably
  - (a) significantly right-skewed
  - (b) approximately bell-shaped
  - (c) significantly left-skewed
2. Jamie randomly selects 100 houses that are for sale in the U.S. The shape of the distribution of their prices is probably
  - (a) significantly right-skewed
  - (b) approximately bell-shaped
  - (c) significantly left-skewed
3. Jamie asks 25 of her friends to each randomly select 4 houses that are for sale in the U.S. and average their 4 prices together. The distribution of these 25 averages is probably
  - (a) significantly right-skewed
  - (b) approximately bell-shaped
  - (c) significantly left-skewed
4. Jamie asks 100 of her friends to each randomly select 4 houses that are for sale in the U.S. and average their 4 prices together. The distribution of these 100 averages is probably
  - (a) significantly right-skewed
  - (b) approximately bell-shaped
  - (c) significantly left-skewed
5. Jamie asks 25 of her friends to each randomly select 50 houses that are for sale in the U.S. and average their 50 prices together. The distribution of these 25 averages is probably

- (a) significantly right-skewed
  - (b) approximately bell-shaped
  - (c) significantly left-skewed
6. Jamie asks 100 of her friends to each randomly select 50 houses that are for sale in the U.S. and average their 50 prices together. The distribution of these 100 averages is probably
- (a) significantly right-skewed
  - (b) approximately bell-shaped
  - (c) significantly left-skewed
7. Why is there a  $\mu$  in the symbol  $\mu_{\bar{x}}$ , which is used to denote the mean of the sampling distribution of the sample mean?
- (a) Strictly speaking, the correct symbol is  $\bar{x}_{\bar{x}}$ , but  $\mu_{\bar{x}}$  is used for simplicity.
  - (b) The  $\mu$  refers to a parameter of the original population.
  - (c) The distribution whose mean is being taken consists of all sample means.
8. A physical therapy class has 10 students. The lightest student weighs 110 pounds, the heaviest student weighs 240 pounds, the median weight of the 10 students is 140 pounds, and the mean weight of the 10 students is 160 pounds. Every student in the class pairs up with another student. In each pair, the two students find the mean of their two weights and then enter the mean into a spreadsheet on a computer in the classroom. Then the students pair off with different partners and again find the mean weight of their pair and type the mean into the spreadsheet. The students keep doing this until each student has been partnered with every other student. What is the most precise thing that can be said about the mean of all the numbers that were typed into the spreadsheet?
- (a) It is between 110 pounds and 240 pounds.
  - (b) It is between 110 pounds and 240 pounds, but is most likely between 140 pounds and 160 pounds.
  - (c) It is 160 pounds.
9. A physical therapy class has 10 students. The lightest student weighs 110 pounds, the heaviest student weighs 240 pounds, the median weight of the 10 students is 140 pounds, and the mean weight of the 10 students is 160 pounds. Every student in the class pairs up with another student. In each pair, the two students find the mean of their two weights and then enter the mean into a spreadsheet on a computer in the

classroom. Then the students pair off with different partners and again find the mean weight of their pair and type the mean into the spreadsheet. The students keep doing this until each student has been partnered with every other student. The standard deviation of all the numbers that were typed into the spreadsheet is calculated. Then the entire experiment is repeated, except this time the students get into groups of five, taking the mean of all five weights, and keep doing this until every possible group of five students has recorded its mean weight. How will the standard deviation of all of the 5-student means compare to the standard deviation of all the 2-student means?

- (a) It will be smaller.
  - (b) It will be the same.
  - (c) It will be larger.
  - (d) We would need to know the weights of all 10 students to answer this.
10. Your statistics professor says to you, “If you can guess a certain quantity within 7 points of its true value, I will give you some extra credit.” Which quantity would you prefer to guess?
- (a) the score on next week’s exam of a randomly selected student
  - (b) the mean of the scores of all the students in the class on next week’s exam
11. The finishing times in a certain race are normally distributed with a mean of 25 minutes and a standard deviation of 4 minutes. What percentage of the samples of 4 finishers have means less than 21 minutes?
- (a) Less than 1%
  - (b) 2.5%
  - (c) 16%
  - (d) None of the above is even close.