

# Classroom Voting Questions: Elementary Statistics

## Estimating with Confidence

1. The fundamental concept underlying statistical inference is that
  - (a) through the use of sample data we are able to draw conclusions about a sample from which the data were drawn.
  - (b) through the examination of sample data we can derive appropriate conclusions about a population from which the data were drawn.
  - (c) when generalizing results to a sample we must make sure that the correct statistical procedure has been applied.
  - (d) Two of the above are true.
  - (e) All of the above are true.
  
2. A 95% confidence interval is an interval calculated from
  - (a) sample data that will capture the true population parameter for at least 95% of all samples randomly drawn from the same population.
  - (b) population data that will capture the true population parameter for at least 95% of all samples randomly drawn from the same population.
  - (c) sample data that will capture the true sample statistic for at least 95% of all samples randomly drawn from the same population.
  - (d) population data that will capture the true sample statistic for at least 95% of all samples randomly drawn from the same population.
  
3. A 95% confidence interval has been constructed around a sample mean of 28. The interval is (21, 35). Which of the following statement(s) is true?
  - (a) The margin of error in the interval is 7.
  - (b) 95 out of 100 confidence intervals constructed around sample means will contain the true population mean.
  - (c) The interval (21,35) contains the true population mean.
  - (d) Both (a) and (b) are true.
  - (e) (a), (b), and (c) are true.

4. A 95% confidence interval for the mean of a population is given as (6.85, 7.61). Is it correct to say that there is a 95% chance that  $\mu$  is between 6.85 and 7.61?
- (a) Yes
  - (b) No
5. Is it correct to say the following? If the process of selecting a sample of size 30 and then computing the corresponding 95% confidence interval is repeated 100 times, 95 of the resulting intervals will include  $\mu$ .
- (a) Yes
  - (b) No
6. A 95% confidence intervals for birthweights is found to be (6.85, 7.61). Is it correct to say that 95% of all birth weights will be between 6.85 and 7.61 pounds?
- (a) Yes
  - (b) No
7. Suppose that a random sample of size 60 resulted in a 90% confidence interval for the proportion of students who carry more than 2 credit cards of (0.52, 0.76). Which of the following is a correct interpretation of the 90% confidence level?
- (a) 90% of the time the population proportion will be between 0.52 and 0.76
  - (b) The method used to construct the interval will produce an interval that includes the value of the population proportion about 90% of the time in repeated sampling.
  - (c) If 100 different random samples of size 60 from this population were each used to construct a confidence 90% confidence interval, 90 of them will contain the value population proportion.
  - (d) The probability that the population proportion is between 0.52 and 0.76 is 0.90.
8. Suppose you construct a 95% confidence interval from a random sample of size  $n = 20$  with sample mean 100 taken from a population with unknown mean  $\mu$  and known standard deviation  $\sigma = 10$ , and the interval is fairly wide. Which of the following conditions would NOT lead to a narrower confidence interval?
- (a) If you decreased your confidence level
  - (b) If you increased your sample size
  - (c) If the sample mean were smaller

- (d) If the population standard deviation were smaller
9. Each individual in a random sample of 40 cell phone users was asked how many minutes of airtime he or she used in a typical month. The data was then used to construct a 99% confidence interval for the mean monthly number of minutes of air time used. The confidence interval was (207, 293). Which of the following could be the 95% confidence interval constructed using this same sample?
- (a) (200, 300)
  - (b) (218, 282)
  - (c) (227, 313)
10. Suppose that for babies born in the United States, birth weight is normally distributed about some unknown mean  $\mu$  with standard deviation  $\sigma = 1.06$  pounds. What is the minimum sample size necessary to ensure that the resulting 99% confidence interval has a width of at most 0.5?
- (a) 70
  - (b) 119
  - (c) 120
  - (d) 140