3.1 review

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem.

1) If $X_1, X_2, X_3, \ldots, X_N$ are the N observations of a variable from a population, then the population mean is symbolized by 1) _____

A) $\tilde{X}$ B) Σ C) μ D) X

State whether the quantity described is a parameter or a statistic and give the correct notation. Give the value of the quantity described

2) Average enrollment in charter schools in Illinois. In 2014, there were148 charter schools in the state of Illinois and the total number of students attending the charter schools was 59,388 2) _____

A) Parameter, $\bar{x}$= 401.3 B) Statistics, $\bar{x}$ = 401.3

C) Parameter, μ =401.3 D) Statistics, μ= 401.3

3) Proportion of US adults who own a cell phone. In a survey of 1006 US adults in 2014, 90% said they had a cell phone. 3) _____

A) Statistics, p = 0.90 B) Statistic, $\hat{p}$ = 0.90

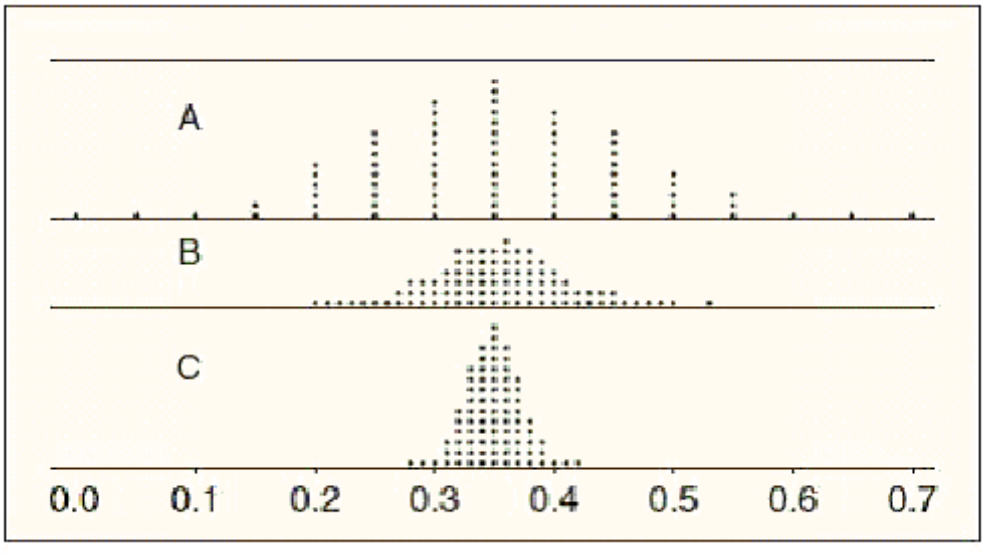
C) Parameter, $\hat{p}$= 0.90 D) Parameter, p= 0.90

Provide an appropriate response.

4) When 460 junior college students were surveyed,100 said that they have previously owned a motorcycle. Find a point estimate for p, the population proportion of students who have previously owned a motorcycle. 4) _____

A) 0.217 B) 0.278 C) 0.783 D) 0.179

The US Census indicates that 35% of US residents are less than 25 years old. Figure 1 shows possible sampling distributions for the proportion of a sample less than 25 years old, for samples of size n=20, n=100, and n=500.



5) Which distribution goes with which sample size n=20? 5) _____

A) A B) B C) C

6) Which distribution goes with which sample size n=500? 6) _____

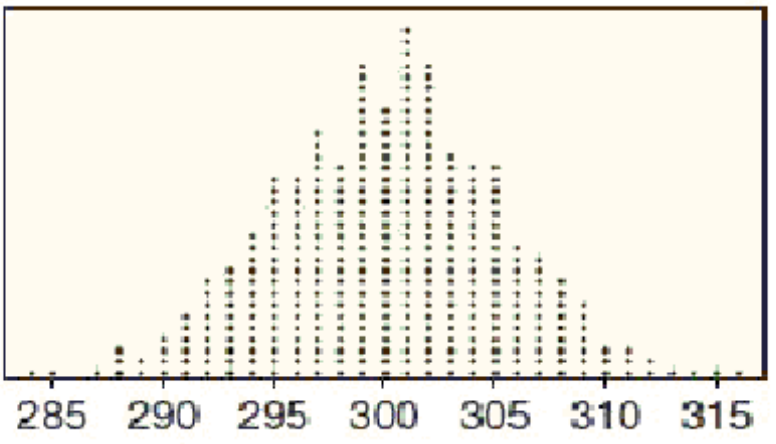
A) C B) A C) B

7) Which distribution goes with which sample size n=100? 7) _____

A) C B) B C) A

Provide an appropriate response.

8) Figure below shows sample means from samples of size n=100 from a population. Estimate the value of the population parameter and estimate the standard error for the sample statistic 8) _____



A) μ= 305, SE=5 B) μ= 300, SE=10 C) μ= 300, SE=5 D) μ= 295, SE=10

A study of n=2252 adults age 18 or older found that 72% of the cell phone users send and receive text messages. A study of n=800 teens age 12 to 17 found that 87% of the teen cell phone users send and receive text messages. What is the best estimate for the difference in the proportion of cell phone users who use text messages, between adults (defined as 18 and over) and teens?

9) Give the notation (as a difference with a minus sign) for the quantity we are trying to estimate. Let group 1 be the adult cell phone users and let group 2 be the teen cell phone users. 9) _____

A) $\bar{x}_1 - \bar{x}_2$ B) p1 - p2 C) $\hat{p}_1 - \hat{p}_2$ D) μ1 - μ2

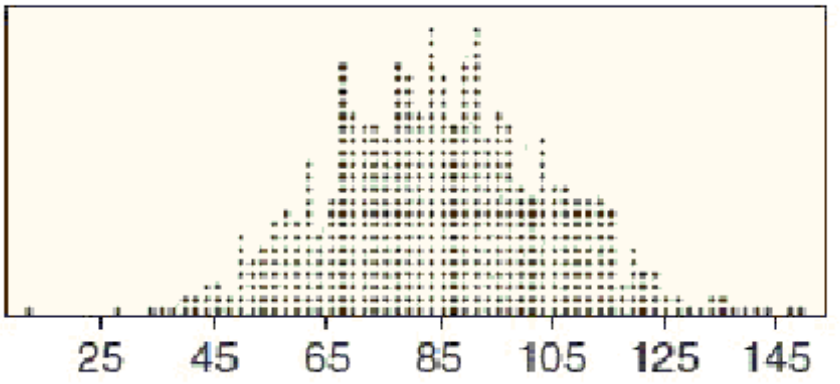
10) Give the notation (as a difference with a minus sign) for the quantity that gives the best estimate. Let group 1 be the adult cell phone users and let group 2 be the teen cell phone users. 10) _____

A) $\hat{p}_1 - \hat{p}_2$ B) μ1 - μ2 C) p1 - p2 D) $\bar{x}_1 - \bar{x}_2$

11) Give the value of the best estimate (point estimate of population parameter) 11) _____

A) 0.72 B) -0.15 C) 0.15 D) 0.87

The sampling distribution shows sample Means from samples of size $n = 30$ from population



Answer the following questions

12) What does one dot on the sampling distribution represent? 12) _____

A) Parameter B) Observation C) Statistic

13) What shape do you expect the sampling distribution to have? 13) _____

A) Skew to left
B) Symmetric and bell shaped
C) skew to right

14) Where should the sampling distribution be centered? 14) _____

A) The standard error B) The population parameter
C) The bootstrap statistic D) The sample statistic

15) Estimate the population mean from the dot plot 15) _____

A) 65 B) 105 C) 85

16) Estimate the standard error of the sample mean 16) _____

A) 40 B) 65 C) 20

17) Using the sampling distribution, how likely is $\bar{x} = 95$? 17) _____

A) Extremely unlikely to ever occur
B) Reasonably likely to occur from a sample of this size
C) Unusual but might occur occasionally

18) Using the sampling distribution, how likely is $\bar{x} = 35$? 18) _____

A) Unusual but might occur occasionally
B) Reasonably likely to occur from a sample of this size
C) Extremely unlikely to ever occur

19) Using the sampling distribution, how likely is $\bar{x} = 149$? 19) _____

A) Unusual but might occur occasionally
B) Extremely unlikely to ever occur
C) Reasonably likely to occur from a sample of this size

20) If samples of size $n = 90$ had been used instead of $n = 30$, which of the following would be true ? 20) _____

A) The variability in the sample statistics would be about the same.
B) The sample mean would have more variability
C) The sample mean would have less variability

21) If samples of size $n = 90$ had been used instead of $n = 30$, which of the following would be true ? 21) _____

A) The sample means would be centered at the same value.
B) The sample means would be centered at a larger value.
C) The sample means would be centered at a small value.

22) If samples of size $n = 20$ had been used instead of $n = 30$, which of the following would be true ? 22) _____

A) The sample mean would have more variability
B) The sample mean would have less variability
C) The variability in the sample statistics would be about the same.