

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

- 1) A college admissions officer takes a simple random sample of 80 entering freshmen and computes their mean mathematics SAT score to be 469. Assume the population standard deviation is $\sigma = 95$. 1) _____

Construct a 90% confidence interval for the mean mathematics SAT score for the entering freshmen class.

- A) (455, 483) B) (467, 471) C) (452, 486) D) (374, 564)

- 2) For a particular diamond mine, 77% of the diamonds fail to qualify as "gemstone grade". A random sample of 112 diamonds is analysed. Find the probability that more than 81% of the sample diamonds fail to qualify as gemstone grade. 2) _____

- A) 0.8438 B) 0.1562 C) 0.1271 D) 0.8729

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion.

- 3) When 293 college students are randomly selected and surveyed, it is found that 114 own a car. 3) _____
Construct a 99% confidence interval for the percentage of all college students who own a car.

- A) (34.2%, 43.6%)
B) (32.3%, 45.5%)
C) (33.3%, 44.5%)
D) (17.4%, 60.4%)
E) (31.6%, 46.2%)

- 4) Of 132 adults selected randomly from one town, 25 of them smoke. Construct a 99% confidence interval for the percentage of all adults in the town who smoke. 4) _____

- A) (11.0%, 25.6%)
B) (11.0%, 26.9%)
C) (12.3%, 25.6%)
D) (13.3%, 24.6%)
E) (10.2%, 27.7%)

- 5) Of 81 adults selected randomly from one town, 64 have health insurance. Construct a 90% confidence interval for the percentage of all adults in the town who have health insurance. 5) _____

- A) (71.6%, 86.5%)
B) (70.1%, 87.9%)
C) (67.4%, 90.7%)
D) (73.0%, 85.0%)
E) (68.5%, 89.6%)

Provide an appropriate response.

- 6) In a survey of 1,000 television viewers, 40% said they watch network news programs. For a 90% confidence level, the margin of error for this estimate is 2.5%. If we want to be 95% confident, how will the margin of error change? 6) _____
- A) Since more confidence requires a more narrow interval, the margin of error will be smaller.
B) Since more confidence requires a wider interval, the margin of error will be larger.
C) Since more confidence requires a wider interval, the margin of error will be smaller.
D) Since more confidence requires a more narrow interval, the margin of error will be larger.
E) There is not enough information to determine the effect on the margin of error.
- 7) The weights of 6-week-old poult (juvenile turkeys) are normally distributed with a mean 9.1 pounds and standard deviation 2.4 pound(s). Find the 13th percentile of the weights. 7) _____
- A) 7.03 lb B) 6.39 lb C) 7.67 lb D) 5.75 lb
- 8) In a survey of 314 registered voters, 156 of them wished to see Mayor Waffleskate lose her next election. Construct a 95% confidence interval for the proportion of registered voter who want to see Mayor Waffleskate defeated. 8) _____
- A) (0.469, 0.525) B) (0.441, 0.552)
C) 0.450, 0.543 D) (0.388, 0.605)
- 9) A sample of size $n = 50$ is drawn from a population whose standard deviation is $\sigma = 14.5$. Find the margin of error for a 90% confidence interval for μ . 9) _____
- A) 3.37 B) 0.89 C) 0.80 D) 2.05
- 10) A sample of size $n = 15$ is drawn from an approximately normal population whose standard deviation is $\sigma = 5.5$. The sample mean is $\bar{x} = 40.8$. Construct a 90% confidence interval for μ . 10) _____
- A) (39.80, 41.80) B) 38.46, 43.14
C) (40.80, 43.14) D) (30.28, 51.32)

Interpret the confidence interval.

- 11) A credit union took a random sample of 40 accounts and obtained the following 90% confidence interval for the mean checking account balance at the institution: $\$2197 < \mu(\text{balance}) < \3846 . 11) _____
- A) If we took random samples of checking accounts at this credit union, about nine out of ten of them would produce this confidence interval.
B) We are 90% sure that the mean balance for checking accounts in the sample was between \$2197 and \$3846.
C) About 9 out of 10 people have a checking account balance between \$2197 and \$3846.
D) We are 90% confident that the mean checking account balance in the U.S. is between \$2197 and \$3846.
E) We are 90% confident that the mean checking account balance at this credit union is between \$2197 and \$3846, based on this sample.

- 12) How many unpopped kernels are left when you pop a bag of microwave popcorn? Quality control personnel at Yummy Popcorn take a random sample of 50 bags of popcorn. They pop each bag in a microwave and then count the number of unpopped kernels. The following interval is produced: 12) _____
- t-interval for μ : with 99% Confidence,
 $11 < \mu(\text{unpopped}) < 25$
- A) About 99% of the sampled bags had between 11 and 25 unpopped kernels.
 B) We are 99% confident that the average number of unpopped kernels in microwave popcorn bags is between 11 and 25.
 C) We are 99% sure that the average number of unpopped kernels in bags of Yummy brand popcorn is between 11 and 25 kernels.
 D) The average number of unpopped kernels in a bag of Yummy popcorn is between 11 and 25 kernels.
 E) 99% of all samples of Yummy popcorn will produce this confidence interval.
- 13) A population has a standard deviation $\sigma = 20.2$. How large a sample must be drawn so that a 98% confidence interval for μ will have a margin of error equal to 4.2? 13) _____
- A) 5 B) 126 C) 226 D) 11
- 14) A bottler of drinking water fills plastic bottles with a mean volume of 994 milliliters (mL) and standard deviation 5 mL. The fill volumes are normally distributed. What proportion of bottles have volumes less than 995 mL? 14) _____
- A) 0.5793 B) 0.5596 C) 0.9974 D) 1.0000
- 15) A sample of size 40 will be drawn from a population with mean 98 and standard deviation 24. Find the 21st percentile of \bar{x} . 15) _____
- A) 94.9 B) 93.8 C) 91.4 D) 90.8
- 16) The mean annual income for people in a certain city (in thousands of dollars) is 40, with a standard deviation of 35. A pollster draws a sample of 48 people to interview. What is the probability that the sample mean income is between 34 and 45 (thousands of dollars)? 16) _____
- A) 0.8389 B) 0.1611 C) 0.7219 D) 0.2781
- 17) A certain car model has a mean gas mileage of 31 miles per gallon (mpg) with a standard deviation 3 mpg. A pizza delivery company buys 35 of these cars. What is the probability that the average mileage of the fleet is between 30.9 and 31.2 mpg? 17) _____
- A) 0.2310 B) 0.4207 C) 0.6517 D) 0.7690

Determine the margin of error in estimating the population parameter.

- 18) Based on a sample of size 49, a 95% confidence interval for the mean score of all students on an aptitude test is from 64.3 to 69.7. 18) _____
- A) 2.7
 - B) 0.05
 - C) 0.76
 - D) 5.4
 - E) Not enough information is given.

- 19) The following display from a TI-84 Plus calculator presents a 95% confidence interval. 19) _____

ZInterval

(41.032, 52.538)

$\bar{x} = 46.785$

$n = 42$

Fill in the blanks: We are _____ confident that the population mean is between _____ and _____.

- A) 5%, 41.032, 52.538
 - B) 5%, 0, 46.785
 - C) 95%, 41.032, 52.538
 - D) 95%, 0, 46.785
- 20) At a cell phone assembly plant, 81% of the cell phone keypads pass inspection. A random sample of 97 keypads is analysed. Find the probability that more than 85% of the sample keypads pass inspection. 20) _____
- A) 0.8413
 - B) 0.8577
 - C) 0.1423
 - D) 0.1587

- 21) A sample of 37 light bulbs had a mean lifetime of 584 hours. A 95% confidence interval for the population mean was $579.2 < \mu < 588.8$. 21) _____

Which one of the following statements is the correct interpretation of the results?

- A) The probability that the population mean is between 579.2 hours and 588.8 hours is 0.95.
- B) 95% of the light bulbs in the sample had lifetimes between 579.2 hours and 588.8 hours
- C) None of these are true.
- D) We are 95% confident that the mean lifetime of all the bulbs in the population is between 579.2 hours and 588.8 hours.

Construct the requested confidence interval from the supplied information.

22) A sociologist develops a test to measure attitudes about public transportation, and 27 randomly selected subjects are given the test. Their mean score is 76.2 and their standard deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects.

22) _____

- A) (74.6, 77.8)
- B) (67.7, 84.7)
- C) (64.2, 83.2)
- D) (64.2, 88.2)
- E) (69.2, 83.2)

Answer Key

Testname: 6 AND 7 IN CLASS EXERCISES

- 1) C
- 2) B
- 3) E
- 4) E
- 5) A
- 6) B
- 7) B
- 8) B
- 9) A
- 10) B
- 11) E
- 12) C
- 13) B
- 14) A
- 15) A
- 16) C
- 17) A
- 18) A
- 19) C
- 20) D
- 21) D
- 22) B