

Name _____

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

- 1) A normal population has a mean $\mu = 30$ and standard deviation $\sigma = 7$. What is the probability that a randomly chosen value will be greater than 31? 1) _____
A) 0.7580 B) 0.7881 C) 0.5557 D) 0.4443

- 2) The weights of 6-week-old poults (juvenile turkeys) are normally distributed with a mean 8.6 pounds and standard deviation 1.9 pounds. A turkey farmer wants to provide a money-back guarantee that her 6-week poults will weigh at least a certain amount. What weight should she guarantee so that she will have to give her customer's money back only 1% of the time? 2) _____
A) 4.17 lb B) 4.59 lb C) 5.00 lb D) 3.34 lb

- 3) 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 $\sigma = 95$. 3) _____

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

- A) (467, 471) B) (455, 483) C) (374, 564) D) (452, 486)
- 4) 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 . 4) _____
A) 0.80 B) 3.37 C) 0.89 D) 2.05

- 5) Use the Central Limit Theorem to find the indicated probability. The sample size is n , the population proportion is p , and the sample proportion is \hat{p} . 5) _____
 $n = 180, p = 0.29; P(\hat{p} < 0.34)$
A) 0.9463 B) 0.9525 C) 0.9474 D) 0.9306

Determine the margin of error in estimating the population parameter.

- 6) 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. 6) _____
- A) 0.05
 - B) 0.76
 - C) 2.7
 - D) 5.4
 - E) Not enough information is given.

Provide an appropriate response.

- 7) 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? 7) _____
- A) Since more confidence requires a more narrow interval, the margin of error will be smaller.
 - B) Since more confidence requires a more narrow interval, the margin of error will be larger.
 - C) Since more confidence requires a wider interval, the margin of error will be larger.
 - D) Since more confidence requires a wider interval, the margin of error will be smaller.
 - E) There is not enough information to determine the effect on the margin of error.

- 8) The real estate industry claims that it is the best and most effective system to market residential real estate. A survey of randomly selected home sellers in Illinois found that a 95% confidence interval for the proportion of homes that are sold by a real estate agent is 69% to 81%. Interpret the interval in this context. 8) _____
- A) 95% of all random samples of home sellers in Illinois will show that between 69% and 81% of homes are sold by a real estate agent.
 - B) We are 95% confident, based on this sample, that between 69% and 81% of all homes in Illinois are sold by a real estate agent.
 - C) We are 95% confident that between 69% and 81% of homes in this survey are sold by a real estate agent.
 - D) In 95% of the years, between 69% and 81% of homes in Illinois are sold by a real estate agent.
 - E) If you sell a home in Illinois, you have an $75\% \pm 6\%$ chance of using a real estate agent.

- 9) 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? 9) _____
- A) 0.7690 B) 0.4207 C) 0.6517 D) 0.2310

Solve the problem. Round to the nearest tenth.

- 10) Based on the Normal model for car speeds on an old town highway $N(77, 9.1)$, what is the cutoff value for the highest 15% of the speeds? 10) _____
- A) about 63.1 mph
 - B) about 11.6 mph
 - C) about 65.5 mph
 - D) about 86.5 mph
 - E) about 67.5 mph

In a standard Normal model, state what value(s) of z cuts off the described region.

- 11) the middle 96% 11) _____
- A) -2.05 to 2.05
 - B) 0 to 2.05
 - C) -1.75 to 1.75
 - D) -3.00 to 3.00
 - E) -2.33 to 2.33
- 12) Find the area under the standard normal curve to the right of $z = 1.6$. 12) _____
- A) 0.0274 B) 0.0548 C) 0.4452 D) 0.9452

- 13) A simple random sample of kitchen toasters is to be taken to determine the mean operational lifetime in hours. Assume that the lifetimes are normally distributed with population standard deviation $\sigma = 28$ hours. 13) _____

Find the sample size needed so that a 95% confidence interval for the mean lifetime will have a margin of error of 4.

- A) 14 B) 189 C) 2 D) 385

Find the specified probability, from a table of Normal probabilities.

- 14) Assume that 20% of students at a university wear contact lenses. We randomly pick 200 students. What is the probability that more than 22% of this sample wear contact lenses? 14) _____
- A) 0.707 B) 0.520 C) 0.480 D) 0.760 E) 0.239
- 15) The number of hours per week that high school seniors spend on homework is normally distributed, with a mean of 10 hours and a standard deviation of 3 hours. 60 students are chosen at random. Let \bar{y} represent the mean number of hours spent on homework for this group. Find the probability that \bar{y} is between 9.8 and 10.4. 15) _____
- A) 0.3043 B) 0.1528 C) 0.547 D) 0.080 E) 0.5161

Describe the indicated sampling distribution model.

- 16) A candy company claims that its jelly bean mix contains 21% blue jelly beans. Suppose that the candies are packaged at random in small bags containing about 400 jelly beans. Describe the sampling distribution model of the proportion of blue jelly beans in a bag. 16) _____
- A) There is not enough information to describe the distribution.
B) $N(21\%, 2.0\%)$
C) $\text{Binom}(400, 21\%)$
D) $N(21\%, 0.8\%)$
E) $N(79\%, 2.0\%)$
- 17) The mean number of pets per household is 3.25 with standard deviation 1.3. A sample of 59 households is drawn. Find the 74th percentile of the sample mean. 17) _____
- A) 3.86 B) 2.70 C) 4.11 D) 3.36

Solve the problem.

- 18) For a recent English exam, use the Normal model $N(73, 9.2)$ to find the percent of scores between 56 and 87. Round to the nearest tenth of a percent. 18) _____
- A) 96.6% B) 3.37% C) 90.4% D) 9.7% E) 3.2%

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

- 19) Of 369 randomly selected medical students, 23 said that they planned to work in a rural community. Construct a 95% confidence interval for the percentage of all medical students who plan to work in a rural community. 19) _____
- A) (3.30%, 9.17%)
B) (2.99%, 9.47%)
C) (4.16%, 8.30%)
D) (3.77%, 8.70%)
E) (5.32%, 7.14%)

Answer Key

Testname: TEST 4B FALL 2016

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