

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

- 1) The difference between a sample mean and the population mean may be referred to as _____ 1) D

 A) skewness B) the variance
 C) the standard deviation D) sampling error

- 2) If the standard deviation of a normally distributed population is 45.0 and we take a sample of size 9, then the standard error of the mean is _____ 2) D
 A) 3.0 B) 5.0 C) 45.0 D) 15.0

- 3) In order to have the standard error of the mean be 15, one would need to take _____ samples from a normally distributed population with a standard deviation of 45. 3) D
 A) 81 B) 3 C) 27 D) 9

- 4) The standard deviation of sample means will be larger than the standard deviation of the population. 4) B
A) True B) False

- 5) A sample of size 65 will be drawn from a population with mean 22 and standard deviation 15. Find the probability that \bar{x} will be between 20 and 25. _____ C
 A) 0.0537 B) 0.7465 C) 0.8040 D) 0.1423

- * 6) A sample of size 50 will be drawn from a population with mean 76 and standard deviation 14. Find the 69th percentile of \bar{x} . 6) B
 A) 81.4 B) 77.0 C) 73.1 D) 81.3

- 7) A sample of size 45 will be drawn from a population with mean 10 and standard deviation 5. Find the probability that \bar{x} will be greater than 11. 7) _____
A) 0.0901 B) 0.0721 C) 0.9099 D) 0.1170

- 8) A certain car model has a mean gas mileage of 28 miles per gallon (mpg) with a standard deviation 5 mpg. A pizza delivery company buys 37 of these cars. What is the probability that the average mileage of the fleet is between 27.2 and 28.8 mpg? 8) B
 A) 0.1660 B) 0.6680 C) 0.3320 D) 0.8340

- 9) The mean number of pets per household is 2.96 with standard deviation 1.4. A sample of 52 households is drawn. Find the 74th percentile of the sample mean. 9) D
 A) 3.74 B) 3.86 C) 2.57 D) 3.08

"true" mean

$\Rightarrow \sigma = 45$

$S = \sigma/\sqrt{n} = 45/\sqrt{9} = 15$

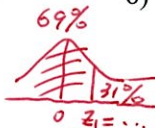
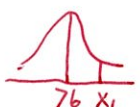
$\Rightarrow S = 15$

$S = \sigma/\sqrt{n} \Rightarrow 15 = 45/\sqrt{n} \Rightarrow n = 9$

$S = \sigma/\sqrt{n}$. $n \geq 1$.
 $\Rightarrow S$ is always smaller!

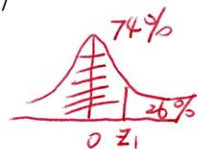
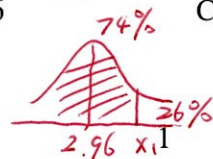


$Z = \frac{\bar{x} - \mu}{\sigma/\sqrt{n}}$



$Z_1 = \frac{x_1 - \mu}{\sigma/\sqrt{n}}$

from table A



- 10) A ferry will safely accommodate ^{max.} 91 tons of passenger cars. Assume that the mean weight of a passenger car is 2.1 tons with standard deviation 0.7 tons. If a random sample of 40 cars are loaded onto the ferry, what is the probability that the maximum safe weight will be exceeded? 10) C
A) 0.0655 B) 0.9429 C) 0.0571 D) 0.0485
- 11) The average age of vehicles registered in the United States is 96 months. Assume the population is normally distributed with a standard deviation of 15 months. Find the probability that the mean age of a sample of 36 vehicles is between 98 and 100 months? 11) C
A) 28.8% B) 6.4% C) 15.7% D) 44.5%
- 12) The average age of doctors in a certain hospital is 45.0 years old. Suppose the distribution of ages is normal and has a standard deviation of 8.0 years. If 9 doctors are chosen at random for a committee, find the probability that the average age of those doctors is less than 46.9 years. Assume that the variable is normally distributed. 12) B
A) 25.8% B) 75.8% C) 59.8% D) 24.2%
- 13) The mean weight of loads of rock is 51.0 tons with a standard deviation of 10.0 tons. If 36 loads are chosen at random for a weight check, find the probability that the mean weight of those loads is less than 50.3 tons. Assume that the variable is normally distributed. 13) B
A) 84.09 B) 34.09 C) 65.91 D) 15.91
- 14) The average number of mosquitos in a stagnant pond is 80 per square meter with a standard deviation of 12. If 36 square meters are chosen at random for a mosquito count, find the probability that the average of those counts is more than 81.8 mosquitos per square meter. Assume that the variable is normally distributed. 14) D
A) 81.6% B) 0.3% C) 31.6% D) 18.4%
- 15) The length of country and western songs is normally distributed and has a mean of 190 seconds and a standard deviation of 30 seconds. Find the probability that a random selection of 16 songs will have mean length of 181.98 seconds or less. Assume the distribution of the lengths of the songs is normal. 15) B
A) 0.64 B) 0.14 C) 0.36 D) 0.86
- 16) The average diameter of sand dollars on a certain island is 3.00 centimeters with a standard deviation of 1.00 centimeters. If 9 sand dollars are chosen at random for a collection, find the probability that the average diameter of those sand dollars is more than 2.60 centimeters. Assume that the variable is normally distributed. 16) B
A) 0.385 B) 0.885 C) 0.615 D) 0.820

Answer Key

Testname: HW6

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