Sampling Distributions for Sample Means Quiz

1. For which of the following conditions is it not appropriate to assume that the sampling distribution of the sample mean is approximately normal?

(A) A random sample of 8 taken from a normally distributed population

(B) A random sample of 50 taken from a normally distributed population

(C) A random sample of 10 taken from a population distribution that is skewed to the right

(D) A random sample of 75 taken from a population distribution that is skewed to the left

(E) A random sample of 100 taken from a population that is uniform

2. At a certain high school, the distribution of backpack weight is approximately normal with mean 19.7 pounds and standard deviation 3.1 pounds. A random sample of 5 backpacks will be selected, and the weight, in pounds, of each backpack will be recorded.

For samples of size 5, which of the following is the best interpretation of $P(\bar{x} > 22) \approx 0.05$?

(A) The probability that each of the 5 backpacks selected will have a weight above 22 pounds is approximately 0.05.

(B) The probability that each of the 5 backpacks selected will have a weight above 19.7 pounds is approximately 0.05.

(C) The probability that the population mean is greater than 22 pounds is approximately 0.05.

(D) For all samples of size 5, approximately 5% of the sample will have a probability greater than 22 pounds.

(E) For all samples of size 5, the probability that the sample mean will be greater than 22 pounds is approximately 0.05.

3. The distribution of prices for a certain car model is approximately normal with mean \$21,800 and standard deviation \$400. A random sample of 4 cars of the model will be selected.

What is the correct unit of measure for the mean of the sampling distribution of $\bar{x}$?

(A) Dollars

(B) Models

(C) Cars

(D) Samples

(E) There are no units associated with the mean of the sampling distribution.

4. A fair die has its faces numbered from 1 to 6. Let random variable F represent the number landing face up when the die is tossed. The probability distribution for the random variable has mean 3.5 and standard deviation 1.7078. Consider a simulation with 400 trials designed to estimate the sampling distribution of the sample mean for 5 tosses of the die. For each trial, the die is tossed 5 times, and the mean of the 5 values landing face up is recorded.

The mean and standard deviation of the results of the simulation should be close to which of the following?

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(A) Mean 3.5 and standard deviation 1.7078

(B) Mean 3.5 and standard deviation 0.7638

(C) Mean 3.5 and standard deviation 0.0854

(D) Mean 17.5 and standard deviation 1.7078

(E) Mean 17.5 and standard deviation 0.7638

5. The mean number of pets owned by the population of students at a large high school is 3.2 pets per student with a standard deviation of 1.7 pets. A random sample of 16 students will be selected and the mean number of pets for the sample will be calculated.

What is the mean of the sampling distribution of the sample mean for samples of size 16 ?

(A) 1.7

(B) 3.2

(C) $\frac{3.2}{\sqrt{16}}$

(D) $\frac{1.7}{\sqrt{16}}$

(E) $\sqrt{\frac{1.7}{16}}$

6. For which of the following is the shape of the sampling distribution of the sample mean approximately normal?

I. A random sample of size 5 from a population that is approximately normal
II. A random sample of size 10 from a population that is strongly skewed to the right
III. A random sample of size 60 from a population that is strongly skewed to the left

(A) I only

(B) III only

(C) I and II only

(D) I and III only

(E) I, II, and III

7. The distribution of age for players of a certain professional sport is strongly skewed to the right with mean 26.8 years and standard deviation 4.2 years. Consider a random sample of 4 players and a different random sample of 50 players from the population.

Which of the following statements is true about the sampling distributions of the sample mean ages for samples of size 4 and samples of size 50 ?

(A) Both will be skewed to the right, and the mean for size 50 will be closer to 26.8 than the mean for size 4.

(B) Both will be skewed to the right, and the standard deviation for size 50 will be closer to 4.2 than the standard deviation for size 4.

(C) Both will be approximately normal, and the mean for size 50 will be closer to 26.8 than the mean for size 4.

(D) Only the sampling distribution for size 4 will be approximately normal, and the standard deviation for both will be 4.2.

(E) Only the sampling distribution for size 50 will be approximately normal, and the mean for both will be 26.8.

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8. A reading specialist wanted to estimate the mean word length, in number of letters, for an elementary school history textbook. The specialist took repeated random samples of size 100 words and estimated the mean and standard deviation of the sampling distribution to be 4.9 letters and 0.15 letter, respectively.

Based on the estimates for the sampling distribution, which of the following provides the best estimates of the population parameters?

(A) Mean 4.9 letters and standard deviation 0.015 letter

(B) Mean 4.9 letters and standard deviation 0.15 letter

(C) Mean 4.9 letters and standard deviation 1.5 letters

(D) Mean 0.49 letter and standard deviation 0.15 letter

(E) Mean 49 letters and standard deviation 15 letters

9. At a large corporation, the distribution of years of employment for the employees has mean 20.6 years and standard deviation 5.3 years. A random sample of 100 employees was selected and surveyed about employee satisfaction. The sample of employees had a mean 20.3 years and standard deviation 6.1 years.

Remy claims that the mean of the sampling distribution of the sample mean for samples of size 100 is 20.6 years. Is Remy's claim correct?

(A) No. The mean of the sampling distribution is 20.3 years.

(B) No. The mean of the sampling distribution is 20.3 employees.

(C) No. The mean of the sampling distribution is 5.3 years.

(D) No. The mean of the sampling distribution is 20.6 employees.

(E) Yes. The mean of the sampling distribution is 20.6 years.