

6.E: Sampling Distributions (Exercises)

1. What is a sampling distribution?

Answer:

The sampling distribution (or sampling distribution of the sample means) is the distribution formed by combining many sample means taken from the same population and of a single, consistent sample size.

2. What are the two mathematical facts that describe how sampling distributions work?

3. What is the difference between a sampling distribution and a regular distribution?

Answer:

A sampling distribution is made of statistics (e.g. the mean) whereas a regular distribution is made of individual scores.

4. What effect does sample size have on the shape of a sampling distribution?

5. What is standard error?

Answer:

Standard error is the spread of the sampling distribution and is the quantification of sampling error. It is how much we expect the sample mean to naturally change based on random chance.

6. For a population with a mean of 75 and a standard deviation of 12, what proportion of sample means of size $n = 16$ fall above 82?

7. For a population with a mean of 100 and standard deviation of 16, what is the probability that a random sample of size 4 will have a mean between 110 and 130?

Answer:

10.46% or 0.1046

8. Find the z -score for the following means taken from a population with mean 10 and standard deviation 2:

a. $\bar{X} = 8, n = 12$

b. $\bar{X} = 8, n = 30$

c. $\bar{X} = 20, n = 4$

d. $\bar{X} = 20, n = 16$

9. As the sample size increases, what happens to the p -value associated with a given sample mean?

Answer:

As sample size increases, the p -value will decrease

10. For a population with a mean of 35 and standard deviation of 7, find the sample mean of size $n = 20$ that cuts off the top 5% of the sampling distribution.

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