

Practice - Sampling Distribution for Sample Mean

January 5, 2022

1. A population has mean 128 and standard deviation 22.

(a) Find the mean and standard deviation of \bar{x} for samples of size 36.

Solution: $\mu_{\bar{x}} = 128, \sigma_{\bar{x}} = 3.67$

(b) Find the probability that the mean of a sample of size 36 will be within 10 units of the population mean, that is, between 118 and 138.

Solution: 0.9936

2. A population has mean 72 and standard deviation 6.

(a) Find the mean and standard deviation of \bar{x} for samples of size 45

Solution: $\mu_{\bar{x}} = 72, \sigma_{\bar{x}} = 0.8944$

(b) Find the probability that the mean of a sample of size 45 will differ from the population mean 72 by at least 2 units, that is, is either less than 70 or more than 74.

Solution: 0.0250

3. A population has mean 557 and standard deviation 35.

(a) Find the mean and standard deviation of \bar{x} for samples of size 50.

Solution: $\mu_{\bar{x}} = 557, \sigma_{\bar{x}} = 4.9497$

(b) Find the probability that the mean of a sample size of 50 will be more than 570.

Solution: 0.0043

4. Suppose the mean number of days to germination of a variety of seed is 22, with standard deviation 2.3 days. Find the probability that the mean germination time of a sample of 160 seeds will be within 0.5 day of the population mean.

Solution: 0.9940

5. Suppose the mean amount of cholesterol in eggs labeled “large” is 186 milligrams, with standard deviation 7 milligrams. Find the probability that the mean amount of cholesterol in a sample of 144 eggs will be within 2 milligrams of the population mean.

Solution: 0.9994

6. Suppose the mean cost across the country of a 30-day supply of a generic drug is \$46.58, with standard deviation \$4.84. Find the probability that the mean of a sample of 100 prices of 30-day supplies of this drug will be between \$45 and \$50.

Solution: 0.9994