

Problem 1. A population has a mean of 50 and a standard deviation of 6. What are the mean and standard deviation of the sampling distribution of the mean for $n = 16$?

Problem 2. Given a test that is normally distributed with mean $\mu = 100$ and a standard deviation of $\sigma = 12$, find the following:

- (a) the probability that a single score drawn at random will be less than 120
- (b) the probability that a single score drawn at random will be greater than 123
- (c) the probability that a sample of 25 scores will have a mean less than 106
- (d) the probability that the mean of a sample of 36 scores will be either less than 95 or greater than 105
- (e) the test score such that the probability of scoring above it is 5%.

Problem 3. In Wisconsin, the mean donut consumption in a week is 48 donuts per person, and the standard deviation of weekly donut consumption is 12 donuts.¹ This week, Jiminy Glick has a weekly donut Z-score of 1.5. How many donuts did Jiminy Glick eat this week?

Problem 4. On average, I eat 7 pizzas per week, with a standard deviation of 1 pizza, and my pizza consumption is normally distributed. What is the probability that I eat less than 5 pizzas in a given week? Don't use R or a normal table.

Problem 5. Explain when you should use the normal distribution and when you should use the $T(n - 1)$ distribution for analyzing sampling means.

Problem 6. Explain the difference between time series data, panel data, and cross-sectional data.

¹I miss Wisconsin.