Name: TAYLOR'S VERSION Student ID: :)

ECON 0150 | MiniExam 05 | Demo

This MiniExam will take 8 minutes with a quick break to follow. MiniExams are designed to both test your knowledge and challenge you to apply familiar concepts in new environments. Treat it as if you're trying to show me that you understand the material. Answer clearly, completely, and concisely.

Academic Conduct Code

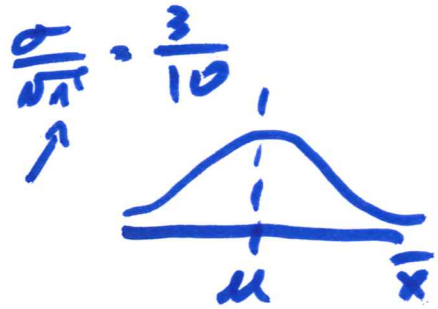
The following academic conduct code is designed to protect the integrity of your work. Print your name/initials beside the three academic honesty agreements. I pledge to my fellow students, the university, and the instructor, that:

✓ I will complete this MiniExam solely using my own work.
✓ I will not use any digital resources unless explicitly allowed by the instructor.
✓ I will not communicate directly or indirectly with others during the MiniExam.

Q1. A restaurant's customer wait times follow a normal distribution with mean (μ) = 15 minutes and standard deviation (σ) = 3 minutes.

a) If you take a sample of 100 customers, the sampling distribution of the mean ($\bar{x}$) will have:

- ☐ Mean = 15, Standard Error = 3
- ☑ Mean = 15, Standard Error = 3/10
- ☐ Mean = Sample Mean, Standard Error = 3
- ☐ Mean = Sample Mean, Standard Error = 3/10



b) If you take a smaller sample of 25 customers instead, what changes?

- ☐ The mean of the sampling distribution
- ☑ The standard error of the sampling distribution
- ☐ Both the mean and standard error
- ☐ Neither the mean nor standard error

Q2. You run a simulation taking 1000 samples (n=50 each) from a population with μ=15 and σ=3. When you plot the histogram of sample means, you notice:

a) The shape of this histogram will be approximately:

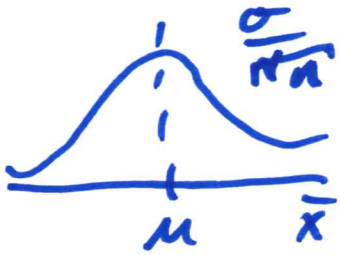
- ☐ The same shape as the original population
- ☐ Always perfectly normal
- ☐ Normal with variance = 9
- ☑ Normal with variance = 9/50

b) Due to the Central Limit Theorem, we know that:

- ☐ The population distributions must be normal
- ☐ The samples must be the same size
- ☑ The sample means will be approximately normally distributed
- ☐ The sample standard deviations will be normally distributed

Q3. You take repeated samples of size n=50 from a population and plot the sample means. Which statement best explains what you expect to see?

- ☐ The histogram will look exactly like the population distribution
- ☐ The histogram will be normal with the same spread as the population
- ☑ The histogram will be normal with less spread than the population
- ☐ The histogram will be normal only if the population is normal



Briefly explain your choice: By the CLT, the sample mean will be distributed approx normally with μ=mean and std. = σ/√n.