Name _____ Score _____ Teacher _____ Date _____

Sampling Distributions and the CLT

Assume iid observations with the stated finite mean and variance. Label exact normal results versus CLT approximations; use provided normal-CDF values and do not treat a sample-size rule as a guarantee.

1. An iid sample has n=49, population mean 10, and population variance 16. The population is normal, so the stated normal sampling law is exact. Explain what the LLN and CLT each say here without claiming the approximation is universally exact.

Assumptions: Sampling is iid with finite variance; sums and means use the same n observations.

Use the stated iid assumptions and sampling-moment formulas.

2. An iid sample has n=36, population mean 11, and population variance 16. The population is not stated normal; use the requested CLT approximation, whose accuracy depends on shape and n. Find P(Xbar <= 11.0000).

Assumptions: Sampling is iid with finite variance; sums and means use the same n observations.

Provided normal CDF: Phi(0.0000)=0.499999985.

Show support, sums or integrals, and approximation assumptions.

Name _____ Score _____ Teacher _____ Date _____

Sampling Distributions and the CLT

Assume iid observations with the stated finite mean and variance. Label exact normal results versus CLT approximations; use provided normal-CDF values and do not treat a sample-size rule as a guarantee.

3. **An iid sample has n=36, population mean 10, and population variance 36. The population is not stated normal; use the requested CLT approximation, whose accuracy depends on shape and n. Find P(9.0000 < Xbar < 12.0000).**

Assumptions: Sampling is iid with finite variance; sums and means use the same n observations.

Provided normal CDF: Phi(-1.0000)=0.158655261; Phi(2.0000)=0.977249870.

4. **An iid sample has n=81, population mean 20, and population variance 16. The population is normal, so the stated normal sampling law is exact. Find P(1584.0000 < S < 1674.0000).**

Assumptions: Sampling is iid with finite variance; sums and means use the same n observations.

Provided normal CDF: Phi(-1.0000)=0.158655261; Phi(1.5000)=0.933192798.

Show support, sums or integrals, and approximation assumptions.

Name _____ Score _____ Teacher _____ Date _____

Sampling Distributions and the CLT

Assume iid observations with the stated finite mean and variance. Label exact normal results versus CLT approximations; use provided normal-CDF values and do not treat a sample-size rule as a guarantee.

5. An iid sample has n=81, population mean 17, and population variance 16. The population is normal, so the stated normal sampling law is exact. Find E(Xbar), Var(Xbar), and standard error.

Assumptions: Sampling is iid with finite variance; sums and means use the same n observations.

Use the stated iid assumptions and sampling-moment formulas.

6. An iid sample has n=16, population mean 16, and population variance 16. The population is not stated normal; use the requested CLT approximation, whose accuracy depends on shape and n. Find E(S), Var(S), and standard error.

Assumptions: Sampling is iid with finite variance; sums and means use the same n observations.

Use the stated iid assumptions and sampling-moment formulas.

Show support, sums or integrals, and approximation assumptions.

Name _____ Score _____ Teacher _____ Date _____

Sampling Distributions and the CLT

Assume iid observations with the stated finite mean and variance. Label exact normal results versus CLT approximations; use provided normal-CDF values and do not treat a sample-size rule as a guarantee.

7. **For X binomial with n=179 and p=0.4, use a normal approximation with continuity correction to estimate P(X<=74).**

Assumptions: Sampling is iid with finite variance; sums and means use the same n observations.

Provided normal CDF: Phi(0.4425)=0.670936300. This continuity-corrected normal result is approximate.

8. **An iid sample has n=64, population mean 14, and population variance 16. The population is not stated normal; use the requested CLT approximation, whose accuracy depends on shape and n. If sample size changes from 64 to 100, compare the standard errors of Xbar.**

Assumptions: Sampling is iid with finite variance; sums and means use the same n observations.

Use the stated iid assumptions and sampling-moment formulas.

Show support, sums or integrals, and approximation assumptions.