Econ 311: Problem Set #5

Due: Monday, December 14, 2009

Q.1 What is a simple random sample?

Q.2 What is the Central Limit Theorem?

Q.3 Given a population with mean $\mu = 200$ and variance $\sigma^2 = 625$, the central limit theorem applies when the sample size $n \geq 25$. A random sample of size $m = 25$ is obtained.

a What are the mean and variance of the sampling distribution for the sample means?

b What is the probability that $\bar{x} > 209$?

c What is the probability that $198 \leq \bar{x} \leq 211$?

d What is the probability that $\bar{x} < 202$?

Q.4 An administrator for a large group of hospitals believes that of all patients 30% will generate bills that become at least 2 month overdue. A random sample of 200 patients is taken.

a What is the standard error of the sample proportion that will generate that become at least 2 month overdue?

b What is the probability that the sample proportion is less than 0.25.

c What is the probability that the sample proportion is more that 0.33.

d What is the probability that the sample proportion is between 0.27 and 0.33?

Q.5 Monthly rates of return on the shares of a particular common stock are independent of one another and normally distributed with a standard deviation of 1.6. A sample of 12 months is taken.

a Find the probability that the sample variance is less than 2.5.

b Find the probability that the sample variance is more than 1.0.