Problems #1 through #3 use the information below.

Suppose that 59% of all people would like to see gun control laws strengthened. In sampling 100 people randomly (with replacement), let x represent the number of people who would like to see gun control laws strengthened.

1. What is the mean of x in this binomial experiment?
2. What is the standard deviation of x in this binomial experiment?
3. Use the normal approximation of the binomial to compute the probability that $x \geq 65$.

Solve the following problems.

4. In a random sample of 16,405 babies who were born stillborn, 8,609 were male. Construct a 99% confidence interval for the proportion of stillborn babies who are male. Source: *Annual Statistical Review*, 1956.
5. Using the data from problem #4, what sample size would have been necessary for a two percentage point error?
6. From a random sample of 51 litters of rats, the mean litter size is 6.11, with an assumed population standard deviation is 2.27. Construct a 94% confidence interval for the mean litter size of rats (these values are based on data gathered by *King* in 1924).
7. Using the data from problem #6, what sample size would have been necessary for a maximum error of 0.1 rats?
8. Hyoscine is a drug which was once used to improve sleep. In 1908, William *Student* Gosset (the developer of Student's t distribution) studied this drug by measuring amounts of sleep gained by ten different patients. The mean sleep gained was 2.33 hours, with a standard deviation of 2.00 hours. Assuming that these values are selected from a normal population, construct a 96% confidence interval for the mean amount of sleep gained by people taking hyoscine.