Stats Homework #8

#1 A farmer weighed a random sample of 9 healthy, egg-producing hens. The sample had a mean mass of 1134 grams and a standard deviation of 124 grams. Assuming that the masses of the population of hens is normally distributed what is the 93% confidence interval for the true mass of the relevant population of hens?

#2 In an investigation of physical fitness of female college students, resting heart rates were recorded for a random sample of 15 female students. The sample had a mean of 72.2 beats per minute and a standard deviation of 6.3 beats per minute. Assuming that the population of female students is normally distributed find the 95% confidence interval for the true mean resting heart rate of the relevant population of female students.

#3 Ten randomly selected automobiles were stopped, and the tread depth of the right front tire was measured. The mean was 0.34 inch, and the standard deviation was 0.08 inch. Find the 99% confidence interval of the mean depth of the population, assuming that it is normally distributed.

#4 A random survey of 90 families showed that 40 owned at least one gun. Find the 97% confidence interval of the true proportion of families who own at least one gun. Check all necessary conditions for the interval to be valid.

#5 A political analyst found that 60% of 300 Repulican voters beleive that the federal government has too much power. Find the 95% confidence interval of the population proportion of Repulican voters who feel this way. Check all necessary conditions for the interval to be valid.

#6 In a study of 200 accidents that required treatment in an emergency room, 40% occurred at home. Find the 95% confidence interval of the population proportion of accidents that happen at home. Check all necessary conditions for the interval to be valid.

#7 An educator desires to estimate, within 0.03, the true proportion of high school students who study at least one hour each school night. She wants to be 98% confident. Previously, she conducted a study and found that 60% of the 250 students surveyed spent at least one hour ach school night studying. How large a random sample is necessary?

#8 A researcher wishes to estimate the proportion of adult males who are under 5 feet 5 inches tall. She wants to be 90% confident that her estimate is within 5% of the true proportion. In a sample of 300 males chosen at random, 30 were under 5 feet 5 inches tall. What size of random sample should she take?

#9 How large a random sample is needed to estimate a country’s true unemployment rate to within $\frac{1}{4}$ of one percentage point at 95% confidence if the true rate is known to be between 3% and 15%?

#10 How large a random sample is needed to estimate the true proportion of General Motors vehicles on a busy highway, with a maximum margin of error of 5 percentage points at 95% confidence?