**Task session two (Estimation)**

1) A government agency was charged by the legislature with estimating the length of time it takes citizens to fill out various forms. Two hundred randomly selected adults were timed as they filled out a particular form. The times required had mean 12.8 minutes with standard deviation 1.7 minutes. Construct a 90% confidence interval for the mean time taken for all adults to fill out this form.  
  
2) Four hundred randomly selected working adults in a certain state, including those who worked at home, were asked the distance from their home to their workplace. The average distance was 8.84 miles with standard deviation 2.70 miles. Construct a 99% confidence interval for the mean distance from home to work for all residents of this state.

3) City planners wish to estimate the mean lifetime of the most commonly planted trees in urban settings. A sample of 16 recently felled trees yielded mean age 32.7 years with standard deviation 3.1 years. Assuming the lifetimes of all such trees are normally distributed, construct a 99.8% confidence interval for the mean lifetime of all such trees.

4) To estimate the number of calories in a cup of diced chicken breast meat, the number of calories in a sample of four separate cups of meat is measured. The sample mean is 211.8 calories with sample standard deviation 0.9 calorie. Assuming the caloric content of all such chicken meat is normally distributed, construct a 95% confidence interval for the mean number of calories in one cup of meat.

5) A security feature on some web pages is graphic representations of words that are readable by human beings but not machines. When a certain design format was tested on 450 subjects, by having them attempt to read ten disguised words, 448 subjects could read all the words.  
  
a. Give a point estimate of the proportion p of all people who could read words disguised in this way.  
b. Show that the sample is not sufficiently large to construct a confidence interval for the proportion of all people who could read words disguised in this way.

6 ) In a random sample of 900 adults, 42 defined themselves as vegetarians.  
  
a. Give a point estimate of the proportion of all adults who would define themselves as vegetarians.  
  
b. Verify that the sample is sufficiently large to use it to construct a confidence interval for that proportion.  
  
c. Construct an 80% confidence interval for the proportion of all adults who would define themselves as vegetarians.

**The Solve**

1) Confidence interval = →

2) Confidence interval =

3) Confidence interval =

4) Confidence interval =

5) p = , the difference between the sample and population is 2.

6) p = , standard deviation = 0.686

Confidence interval =