

## SOC510 Homework #7: Chapter 14

Due October 27 (Tuesday)

1. A random sample of size 36 is to be selected from a population that has a mean  $\mu$  of 50 and a standard deviation  $\sigma$  of 10.
  - (a) What is the probability that this sample mean will be between 45 and 55?
  - (b) What is the probability that this sample mean will have a value greater than 48?
  - (c) What is the probability that this sample mean will be within 1.96 standard error?
  - (d) What is the probability that this sample mean will be within 1.96 population standard deviation?
2. Find  $P(4 < \bar{x} < 6)$  for a random sample of size 4 drawn from a normal population with mean  $\mu = 5$  and standard deviation  $\sigma = 2$ .
3. A report in Time magazine (April 15, 2002) stated that the average age for women to marry in the US is now 25. If the standard deviation is assumed to be 3.2 years, find the probability that a random sample of 40 US women show a mean age at marriage of less than or equal to 24 years.
4. A tire manufacture claims (based on years of experience with its tires) that the tires' mean mileage is 35,000 mi and the standard deviation is 5,000 mi. A consumer agency randomly selects 100 of these tires and finds a sample mean of 31,000 mi. Should the consumer agency doubt the manufacturer's claim?
5. A recent study from the University of Michigan stated that today (as of 2002) men average 16 hours of housework each week (up from an average of 12 hours in 1965). If we assume that the number of hours in which men engage in housework each week is normally distributed with a standard deviation of 5.4 hours,
  - (a) what is the probability that the mean number of housework hours for a sample of 20 randomly selected men is between 15 and 18?
  - (b) what is the probability that the mean number of housework hours for a sample of 100 randomly selected men is between 15 and 18?
  - (c) what is the probability that the mean number of housework hours for a sample of 100 randomly selected men is within 2.58 standard errors?
  - (d) what is the probability that the mean number of housework hours for a sample of 50 randomly selected men is within 1.96 standard errors?
6. Do the following exercise from the textbook (you should show your work, not just answers): 14.17; 14.20 (explain); 14.30 (a); 14.34;