Name:

Elementary Statistics **HW 6.5 part 2**

1. In each drawing for the Texas Pick 3 lottery, three digits between 0 and 9 inclusive are randomly selected. What is the distribution of the selected digits? If the mean is calculated for each drawing, can the distribution of the sample means be treated as a normal distribution?

For questions 2-3, use the following data from the Federal Aviation Administration:

Overhead reach distances of adult females are normally distributed with a mean μ = 205.5 cm and a standard deviation σ = 8.6 cm. The overhead reach distances are used in planning assembly work stations.

2. If 1 adult female is randomly selected, find the probability that her overhead reach is between 180.0 cm and 200.0 cm.

3. If 50 adult females are randomly selected, find the probability that they have a mean overhead reach between 198.0 cm and 206.0 cm.

According to the website www.torchmate.com, "manhole covers must be minimum of 22 inches in diameter, but can be as much as 60 inches in diameter." Assume that a manhole is constructed to have a circular opening with a diameter of 22 inches. Men have shoulder breadths that are normally distributed with a mean of 18.2 inches and a standard deviation of 1.0 inches. Use this data from the National Health and Nutrition Examination Survey to answer questions 4-5.

4. What percentage of men will fit into the manhole?

5. Assume that the Connecticut Light and Power Company employs 36 men who work in manholes. If 36 men are randomly selected, what is the probability that their mean shoulder breadth is less than 18.5 inches? Does this result suggest that money cannot be saved by making smaller manholes with a diameter of 18.5 inches? Why or why not?

The Ethan Allen tour boat capsized and sank in Lake George, NY and 20 of the 47 passengers drowned. Based on a 1960 assumption of a mean weight of 140 lb for passengers, the boat was rated to carry 50 passengers. After the boat sank, New York State changed the assumed mean weight from 140 lb to 174 lb. Use this data to answer questions 6-7 below:

6. Given that the boat was rated for 50 passengers with and assumed mean of 140 lb, the boat had a passenger load limit of 7000 lb. Assume that the boat is loaded with 50 male passengers and assume that weights of men are normally distributed with a mean of 182.9 lb. and a standard deviation of 40.8 lb, find the probability that the boat is overloaded because the 50 male passengers have a mean weight greater than 140 lb.

7. The boat was later rated to carry only 14 passengers and the load limit was changed to 2436 lb. If 14 passengers are all males, find the probability that the boat is overloaded because the mean weight is greater than 174 lb. (so that their total weight is greater than the maximum capacity of 2436 lb). Do the new ratings appear to be safe when the boat is loaded with 14 male passengers?