## Name:

## **Elementary Statistics**

- 1. The population of current statistics students has ages with mean  $\mu$  and standard deviation  $\sigma$ . Samples of statistics students are randomly selected so that there are exactly 40 students in each sample. For each sample, the mean age is computed.
- Heights of adult females are normally distributed. Samples of heights of adult females, each of size n = 3, are randomly collected and the sample means are found. Is it correct to conclude that the sample means cannot be treated as a normal distribution because the sample size is too small? Explain.
- 3. The population of distances that adult females can reach forward is normally distributed with a mean of 60.5 cm and a standard deviation of 6.6 cm (from the Federal Aviation Administration). If samples of 36 adult females are randomly selected, what do  $\mu_{\bar{x}}$  and  $\sigma_{\bar{x}}$  represent and what are their values?

For questions 4-7, use the following data from the Federal Aviation Administration:

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

4. If 1 adult female is randomly selected, find the probability that her overhead reach is less than 196.9 cm.

5. If 36 adult females are randomly selected, find the probability that they have a mean overhead reach less than 205.0 cm.

6. If 1 adult female is randomly selected, find the probability that her overhead reach is greater than 195.0 cm.

- 7. 25 adult females are randomly selected. You want to find the probability that they have a mean overhead reach greater than 203.0 cm.
  - a. Why can you use the central limit theorem for this example even though the sample size does not exceed 30?

b. Find the probability that the sample of 25 adult females has a mean overhead reach greater than 203.0 cm.