Chapter 8 and 9 Test

1) **Political Prisoners**. A. Ehlers et al. studied various characteristics of political prisoners from the former East Germany and presented their findings in the paper "Posttraumatic Stress Disorder (PTSD) Following Political Imprisonment: The Role of Mental Defeat, Alienation, and Perceived Permanent Change" (*Journal of Abnormal Psychology*, Vol. 109, pp. 45–55). According to the article, the mean duration of imprisonment for 32 patients with chronic PTSD was 33.4 months. Assuming that σ = 42 months, determine a 95% confidence interval for the mean duration of imprisonment, μ, of all East German political prisoners with chronic PTSD. Interpret your answer in words.

2) **Bottlenose Dolphins**. The webpage "Bottlenose Dolphin" produced by the National Geographic Society provides information about the bottlenose dolphin. A random sample of 50 adult bottlenose dolphins have a mean length of 12.04 ft with a standard deviation of 1.03 ft. Find and interpret a 90% confidence interval for the mean length of all adult bottlenose dolphins.

3) **Early-Onset Dementia.** Dementia is the loss of intellectual and social abilities severe enough to interfere with judgment, behavior, and daily functioning. Alzheimer's disease is the most common type of dementia. In the article "Living with Early Onset Dementia: Exploring the Experience and Developing Evidence-Based Guidelines for Practice" (*Alzheimer's Care Quarterly*, Vol.5, Issue 2, pp. 111–122), P. Harris and J. Keady explored the experience and struggles of people diagnosed with dementia and their families. A simple random sample of 21 people with early-onset dementia gave the following data on age at diagnosis, in years. At the 1% significance level, do the data provide sufficient evidence to conclude that the mean age at diagnosis of all people with early-onset dementia is less than 55 years old? Assume that the population standard deviation is 6.8 years. (*Note:* sample mean is 52.5 years)

4) **Dirt Bikes.** Dirt bikes are simpler and lighter motorcycles that are designed for off-road events. Specifications for dirt bikes can be found through Motorcycle USA on their website www.motorcycle-usa.com. A random sample of 30 dirt bikes have a mean fuel capacity of 1.91 gallons with a standard deviation of 0.74 gallons. At the 10% significance level, do the data provide sufficient evidence to conclude that the mean fuel tank capacity of all dirt bikes is less than 2 gallons?

5) **Death Rolls.** Alligators perform a spinning maneuver, referred to as a "death roll," to subdue their prey. Videos were taken of juvenile alligators performing this maneuver in a study for the article "Death Roll of the Alligator, Mechanics of Twist and Feeding in Water" (*Journal of Experimental Biology*, Vol. 210, pp. 2811–2818) by F. Fish et al. One of the variables measured was the degree of the angle between the body and head of the alligator while performing the roll. A sample of 20 rolls yielded the following data, in degrees. At the 5% significance level, do the data provide sufficient evidence to conclude that, on average, the angle between the body and head of an alligator during a death roll is greater than 45°? (*Note:* The sample mean and sample standard deviation of the data are 49.0 and 10.0, respectively.)