1. Do Exercise 9.71, 9.72 & 9.73 on page 431 (443) in the textbook. In each one of
the problems answer part (a) only.

2. Do Exercise 9.75 on page 431 (443) in the textbook. Use the p-value approach
to hypothesis testing. Assume normality for the cadmium level in mushrooms.

3. Do Exercise 6 in assignment 8 but use the p-value approach to hypothesis
  testing. Wording follows.

   **Beer Drinking.** The mean annual consumption of beer per person in the US is
   22.0 gallons. A random sample of 300 Washington D.C. residents yielded a
   mean annual beer consumption of 27.8 gallons. At the 10% significance level, do
   the data provide sufficient evidence to conclude that the mean annual
   consumption of beer per person for the nation’s capital differs from the national
   mean? Assume that the standard deviation of annual beer consumption for
   Washington D.C. residents is 55 gallons.


5. Do Exercises 10.23 & 10.27 on page 493 (502) & 494 (503) in the textbook.


**Exercises for recitations:**

The following question was given in Assignment 8, question #3, Exercises for
recitations:

Biological Oxygen Demand (BOD) is an index of pollution that is monitored in the
treated effluent of paper mills on a regular basis. From 43 determinations of BOD (in
pounds per day) at a particular paper mill during the Spring of 1992, the mean and SD
were found to be 3,246 and 757, respectively. The company has set the target that the
mean BOD should be 3,000 pounds per day. Do the sample data indicate that the
actual amount of BOD is significantly off the target? (Use \( \alpha=0.05 \).)
1. Refer to problem above. Along with the determinations of BOD, the discharge of suspended solids (SS) was also monitored at the same site. The mean of the 43 determinations of SS was found to be 5,710 and the population standard deviation is assumed to be 1,720 pounds per day. Do these results strongly support the company's claim that the true mean SS is lower than 6,000 pounds per day? Use \( \alpha = 0.05 \). Use a p-value to make your decision.

2. Refer to problem 1 but assume that the sample size is 20. Also assume that the estimated mean and standard deviation of the sample of 20 are the same as in 1. Test the hypothesis using \( \alpha = 0.10 \). What assumption do you have to make for the test to be valid?

3. The US Bureau of prisons publishes data on the times served by prisoners released from federal institutions for the first time. Independent random samples of released prisoners in the fraud and firearms offense categories yielded the following statistics:

<table>
<thead>
<tr>
<th></th>
<th>Fraud</th>
<th>Firearms</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \bar{x}_1 )</td>
<td>10.12</td>
<td>18.78</td>
</tr>
<tr>
<td>( s_1 )</td>
<td>4.90</td>
<td>4.64</td>
</tr>
<tr>
<td>( n_1 )</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

a. At the 5% significance level, do the data provide sufficient evidence to conclude that the mean time served for fraud is less than that for firearms offenses?

b. Determine a 95% CI for the difference between the mean time served for fraud and firearms offenses.

c. Interpret your answer in part (b).

4. A research study indicated that low cholesterol and depression were linked. The researchers found that among 331 randomly selected patients hospitalized because they had attempted suicide, the mean cholesterol level was 198. The mean cholesterol level of 331 randomly selected patients admitted to hospital because of other reasons was 214. The sample standard deviations were reported to be 20 for the group who attempted suicide and 24 for the other group.

Does this data provide sufficient evidence to conclude that the mean cholesterol level is lower for those who have attempted suicide? Test the relevant hypothesis using \( \alpha = 0.05 \).