Homework Assignment Number Six

We intend to purchase a liquid as a raw material for a material we are designing. Two vendors offer us samples of their product and a statistic sheet. We run the samples in our own labs and come up with the following data:

Vendor 1		Vendor 2	
sample #	outcome	sample #	outcome
1	2.30	1	2.49
2	2.49	2	1.98
3	2.05	3	2.18
4	2.40	4	2.36
5	2.18	5	2.47
6	2.12	6	2.36
7	2.38	7	1.82
8	2.39	8	1.88
9	2.40	9	1.87
10	2.46	10	1.87
11	4.19		
12	2.04		
13	2.43		
14	2.34		
15	2.19		
16	2.12		

Vendor Specification Claims:
Vendor 1: $\mu = 2.0$ and $\sigma^2 = 0.05$
Vendor 2: $\mu = 2.3$ and $\sigma^2 = 0.12$

Problem 1. (8 points)

Perform an outlier analysis on the data from both vendors.
(a) How many outliers are present in the data from vendor 1?
(b) Which data points from vendor 1 are outliers?
(c) How many outliers are present in the data from vendor 2?
(d) Which data points from vendor 2 are outliers?

Problem 2. (8 points)

Compute the following statistics, excluding outliers.
(a) sample mean of vendor 1.
(b) sample standard deviation of vendor 1.
(c) sample mean of vendor 2.
(d) sample standard deviation of vendor 2.

Problem 3. (4 points)

(a) Determine a 95% confidence interval on the mean of sample 1. Assume the given values of the population variances provided by the vendor are suspect and not to be trusted.

(b)Is the given population mean legitimate?

Problem 4. (4 points)

(a) Determine a 95% confidence interval on the difference of means between samples 1 and 2. Assume the given values of the population variances are suspect and not to be trusted.

(b) Is the difference between the given population means legitimate?

Problem 5. (4 points)

(a) Determine a 95% confidence interval on the variance of sample 1.

(b) Is the given population variance legitimate?

Problem 6. (4 points)

(a) Determine a 95% confidence interval on the ratio of variance of samples 1 & 2.

(b) Is the ratio of the given population variances legitimate?