Assignment 1 (due October 9, 2013)

You and your friend working in a different lab have been given an unknown water sample that contains potassium. You are both asked to measure the potassium concentration in the solution (10 replicate measurements). The methods that you and your friend are using are different. The results that were obtained are listed below. Determine:

(a) the concentration, standard deviation and relative standard deviation for the unknown as measured using the two methods (check for outliers!),
(b) calculate the detection limit (3σ) for each method,
(c) compare the standard deviations and evaluate whether the two averages are significantly different (or not) at the 95% confidence level.

Provide calculations for each step. If a table (*t*, *F* or *G*) value is not available in the book (for example, if looking for a *t*-value for a degrees of freedom equal to 27 – hypothetical case), just interpolate the two closest values (25 and 30 in this hypothetical case).

RESULTS:

Standard Concentration (mg/L)	Method 1 Intensity (nA)	Method 2 Intensity (mV)
0.000	0.624	1.955
0.000	0.488	2.490
0.000	0.522	2.166
0.000	0.355	1.500
5.000	9.245	15.644
10.000	17.069	31.220
15.000	26.200	44.266
20.000	33.881	62.394
25.000	43.826	75.611
Replicate		
1	26.544	46.977
2	25.449	49.120
3	21.053	50.998
4	24.353	46.615
5	23.899	49.326
6	24.010	46.666
7	25.554	45.291
8	23.549	42.995
9	26.008	43.678
10	24.404	49.012