

NAME _____; Upon placing your signature in this space you are indicating that you have not violated any statute of your respective Honor Codes by completing the following quiz.

MEASUREMENT STATISTICS

Dominey

Due: Sept. 19, 2000

Problem Set 2

1. In a fluorometric determination of quinine, the true concentration of a solution is 1.06×10^{-6} M. From past analyses, it is known that the standard deviation of individual measurements is 8.3×10^{-8} M at this concentration level.
 - (a) Describe in words why we can increase the precision of a quinine determination by taking the mean of several measurements.
 - (b) Assuming no measurement bias, what is the probability that the mean of 5 determinations will be greater than 1.10×10^{-6} M?

2. An analytical chemist measured the phosphorus content (in w/w %) of three different tree leaves; the results are given in the following table.

sample 1:	0.35	0.40	0.58	
sample 2:	0.65	0.70		
sample 3:	0.60	0.80	0.73	0.66

The precision is the same for all of these measurements. What is the phosphorus content of sample #3? Report the mean measured as well as the standard error of the mean.

3. Explain the concept of **sample statistics** in terms that a senior in high school (one who has never taken a course in statistics) would understand.