

Statistics 506
Test 1

1. Sources of error for a GPS (Global Positioning System) Receiver are being investigated. Factors include the number of readings (1 vs. 180), location (open field vs. forest) and differential correction (No, Yes); the response is the difference between the reading and known location of objects being measured.
 - (a) Using the responses below, analyze the data.
 - (b) Some of the factor settings markedly affect the GPS reading; in this case, a natural log transformation of the data may simplify the analysis. Re-analyze the data after taking the natural log of the responses. Did the transformation affect your analysis? Suppose a base 10 log transformation is used—would your analysis differ?

(A,B,C)	Response (meters)
(1,Field,No)	.368
(1,Field,Yes)	.741
(1,Forest,No)	.247
(1,Forest,Yes)	1.649
(180,Field,No)	16.445
(180,Field,Yes)	121.51
(180,Forest,No)	22.198
(180,Forest,Yes)	164.022

2. A student randomized runs from a 2^3 experiment, but accidentally stored only the levels of the A, B and ABC effects. What are the signs of the other effects and what was the random run order (use Taguchi's standard order here)? Analyze the data.

A	B	ABC	Response
1	1	1	7.2
-1	1	-1	8.1
-1	-1	1	7.0
1	-1	-1	7.8
-1	1	1	6.7
1	-1	1	5.9
-1	-1	-1	6.6
1	1	-1	6.3