ID# _____ Exam 2 PS 217, Spring 2008

As always, the Skidmore Honor Code is in effect. At the end of the exam, I have a sheet on which you will attest to your adherence to the Honor Code. Read each question carefully and answer completely, showing all your work. Good Luck!

1. (From G&W7) People with agoraphobia are so filled with anxiety about being in public places that they seldom leave their homes. Knowing this is a difficult disorder to treat, a researcher tries a long-term treatment. A sample of individuals report how often they have ventured out of the house in the past month. Then they receive relaxation training and are introduced to trips away from the house at gradually increasing durations. After two months of treatment, participants report the number of trips out of the house they made in the last 30 days. Analyze the data below as completely as possible [15 pts]

Participant	Before Treatment	After Treatment
1	0	4
2	0	0
3	3	14
4	3	23
5	2	9
6	0	8
7	0	6
Sum (*T*)	8	64
ΣX^2	22	922
SS	12.86	336.86

2. (From G&W1) A scientist tests two drugs for their effects on insomnia. A sample of $n = 10$ insomniacs is pre-tested with a placebo before bedtime, and the latency to sleep is measured to serve as a baseline. A week later, the subjects receive Drug 1 before bedtime, and the time that lapses between drug administration and sleep onset is measured again. Finally, a week later Drug 2 is tested in the same fashion. The latency to sleep (in minutes) is the DV in the analysis seen below. Complete the source table and interpret the results of this study as completely as you can. [15 pts]

Descriptive Statistics

	Mean	Std. Deviation	N
Pretest	109.7000	34.42238	10
Drug1	72.7000	38.93599	10
Drug2	58.6000	42.32205	10

Tests of Within-Subjects Effects

Measure:MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Drug	Sphericity Assumed	13930.0				.010	.402	12.084	.823
	Greenhouse-Geisser					.015	.402	9.983	.761
	Huynh-Feldt					.010	.402	11.941	.819
	Lower-bound					.036	.402	6.042	.592
Error(Drug)	Sphericity Assumed	20750.6							
	Greenhouse-Geisser								
	Huynh-Feldt								
	Lower-bound								

a. Computed using alpha = .05

3a. (From G&W1) Does coffee help people to become sober more quickly after drinking too much? The (made-up) data below represent the results from an experiment intended to address this question. A sample of 40 volunteers is randomly divided into four groups. One group serves as a control and receives no alcohol. Subjects in each of the remaining three groups drink a fixed amount of alcohol in a one-hour period. During the next half hour, subjects in the second group drink two cups of decaffeinated coffee, subjects in the third group drink two cups of regular coffee, and subjects in the final group drink two cups of water. Finally, all subjects are given a reaction time test to determine mental alertness (i.e., faster reaction times indicate greater alertness). Complete the source table below and interpret the results of this study as completely as you can. [15 pts]

Descriptives

Reaction Time Test

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Control	10	194.9000	10.80586	3.41711	187.1700	202.6300	179.00	215.00
Decaf Coffee	10	212.3000	12.89315	4.07717	203.0768	221.5232	191.00	230.00
Regular Coffee	10	211.1000	14.13781	4.47077	200.9864	221.2136	189.00	231.00
Water	10	211.5000	14.56976	4.60736	201.0774	221.9226	192.00	231.00
Total	40	207.4500	14.64442	2.31549	202.7665	212.1335	179.00	231.00

ANOVA

Reaction Time Test

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups			702.5	4.0	.014
Within Groups					
Total					

3b. Suppose that you had only the Descriptive Statistics for the analysis above. How could you use that information to determine the $MS_{\text{Within Groups}}$? [2 pts]

3c. What parameter is estimated by $MS_{\text{Within Groups}}$? [2 pts]

3d. Again, look at the Descriptive Statistics for the analysis above. What information found in that table is driving the $MS_{\text{Between Groups}}$? [2 pts]

3e. Let's presume that regular coffee would actually speed up reaction times, but that its effect was quite small. How could you detect the effect of regular coffee in an experiment? [2 pts]

3f. Suppose that this experiment were to be conducted as a repeated measures design. In other words, the 40 scores came from $n = 10$ people who were each tested under each of the four conditions. What would happen to your df_{Error}? What would likely happen to your F-ratio? [2 pts]