Name _____ Assignment (circle, as instructed):
Date Due _____ Problems 1 2 3 4 5 6 ALL

Factorial Designs Exercise II (40 points)

Instructions: For each experimental design and results, answer the questions about main effects and interactions as indicated.

Design 1 (6 points)

		IVb B_1	IVb B_2
IVa	A_1	4	6
	A_2	3	8

Note: Use the "eyeball method" to answer these questions.

Is there a main effect of IVA? _____

Overall group means: _____ A1

_____ A2

Is there a main effect of IVB? _____

Overall group means: _____ B1

_____ B2

Is there an A x B interaction? _____

How do you know?

Factorial Designs II (continued)

Design 2 (6 points)

		IVA A1	IVA A2	IVA A3
IVB	B1	5	6	6
	B2	6	7	8
	B3	7	10	15

Is there a main effect of IVA? _____

Overall group means: _____ A1

_____ A2

_____ A3

Is there a main effect of IVB? _____

Overall group means: _____ B1

_____ B2

_____ B3

Is there an A x B interaction? _____

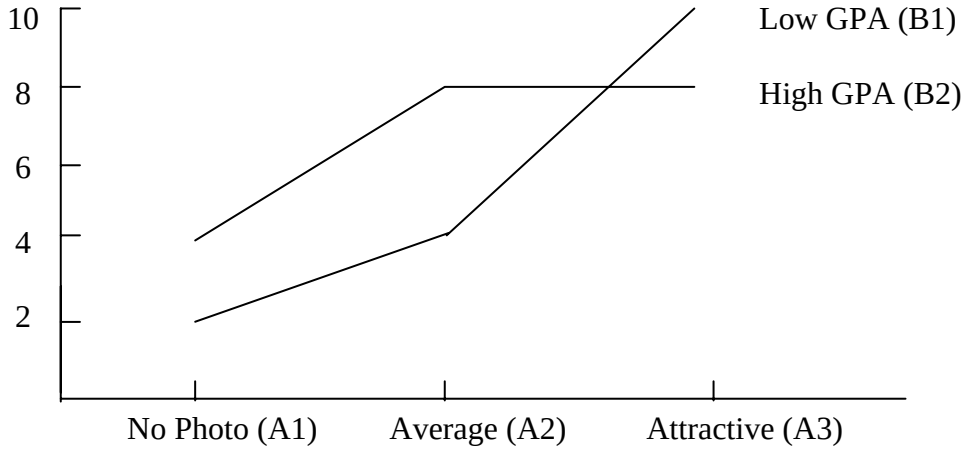
Describe these differences in words:

Factorial Designs II (continued)

Design 3 (5 points)

A researcher studied the influence of a woman's attractiveness and intelligence on her dating desirability. Male participants read a "dating profile" accompanied by a photo of an attractive or average-looking young woman; a no photo condition also was used. Intelligence was manipulated by reporting her college GPA as 3.8 or 2.5. Participants then rated the likelihood the woman would be asked out by most men on a 10-point scale.

This figure displays the results of the study.



Note: Use the "eyeball method" to answer these questions:

Hint: The main effects may be easier to determine if you create your own data matrix.

Is there a main effect of IVA? _____

Overall group means: _____ A1

_____ A2

_____ A3

Is there a main effect of IVB? _____

Overall group means: _____ B1

_____ B2

Is there an A x B interaction? _____

Factorial Designs II (continued)

Design 4 (6 points)

Anders, Fozard, and Hillyquist (1972) studies short-term memory as functions of the number of items to remember and the participants' age. Participants' response times were measured in milliseconds (the larger the number, the more time it took), and are shown below:

Response Time (in Milliseconds)

	Number of Digits to Remember (IVB)			
Age of Participant (IVA)	1	3	5	7
19-21 (young)	680	710	740	750
33-43 (middleage)	690	740	810	900
58-85 (old)	790	1000	1100	1250

Note: Use the "eyeball method" to answer these questions.

Is there a main effect of IVA? _____

Overall group means: _____ Young (A1) _____ Middle (A2) _____ Old (A3)

Describe these differences in words using the appropriate labels and terminology:

Is there a main effect of IVB? _____

Overall group means: _____ 1 digit (B1) _____ 5 digits (B3)

_____ 3 digits (B2) _____ 7 digits (B4)

Describe these differences in words using the appropriate labels and terminology:

Factorial Designs II (continued)

Design 5 (8 points)

Cooper and Zubeck (1958) studied the influence of different environments on maze-running performance in rats bred to be genetically "maze bright" or "maze dull." Their results were:

Mean Errors in Maze-Running [a]

	Environmental Conditions (IVB)		
Genetic Line (IVA)	Restricted	Normal	Enriched
Dull	169.5	164.0	119.7
Bright	169.7	117.0	111.2

[a] The higher the score, the poorer the performance.

Note: Use the "eyeball method" to answer these questions.

Is there a main effect of genetic line (IVA)? _____

Overall group means: _____ dull (A1)

_____ bright (A2)

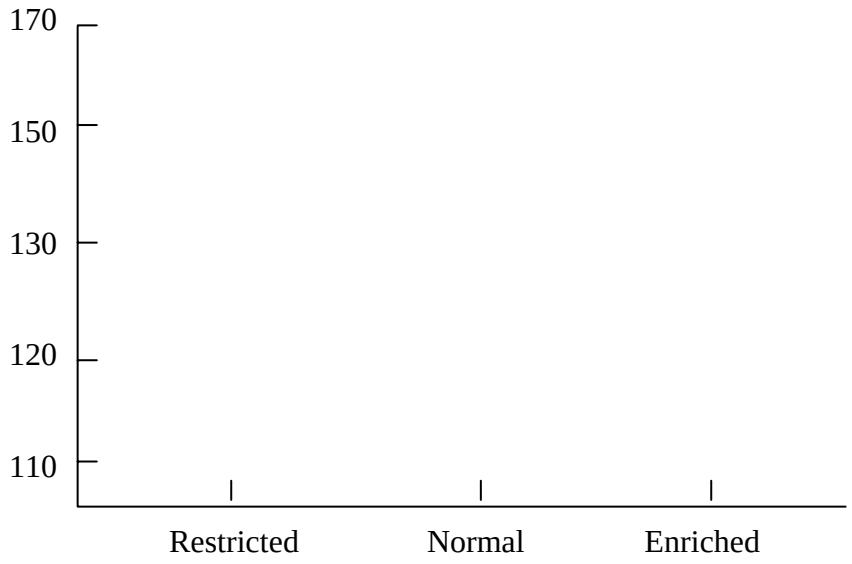
Describe the group differences in words using the appropriate labels and terminology:

Continued ------->>

Factorial Designs II (continued)

Is there a Genetic Line x Environment (A x B) interaction? _____

Graph the interaction:



Describe the interaction in words, that is, the way you would write up a results section.

Factorial Designs II (continued)
Design 6 (9 points)

A researcher studied the influence of intensity of room illumination on reading speed in 5th graders. Also, children were classified as "good" or "bad" readers from achievement test scores. Each group of children read 750 word passages under all three levels of illumination (three reading trials). The order of trials for each child was randomly determined. The average number of passages read in ten minutes are tabled below.

Number of Passages Read

	Room Illumination (IVA)		
Reading Ability (IVB)	Low	Medium	High
Poor	5.0	4.5	3.5
Good	6.5	8.0	10.5

This is an analysis of variance summary table on the above reading passage data:

Source of Variance	Sum of Squares	df	Mean Square	F
A (Room Illumination)	8.0	2	4.0	2.0
B (Reading Ability)	30.0	1	30.0	6.0 **
A x B	40.0	2	20.0	4.0 *
Trials (error)	24.0	12	2.0	
Error	90.0	18	5.0	

* $p < .05$
** $p < .01$

Of the three possible results, which were significant? (check)

_____ IVA (Room Illumination)

_____ IVB (Reading Ability)

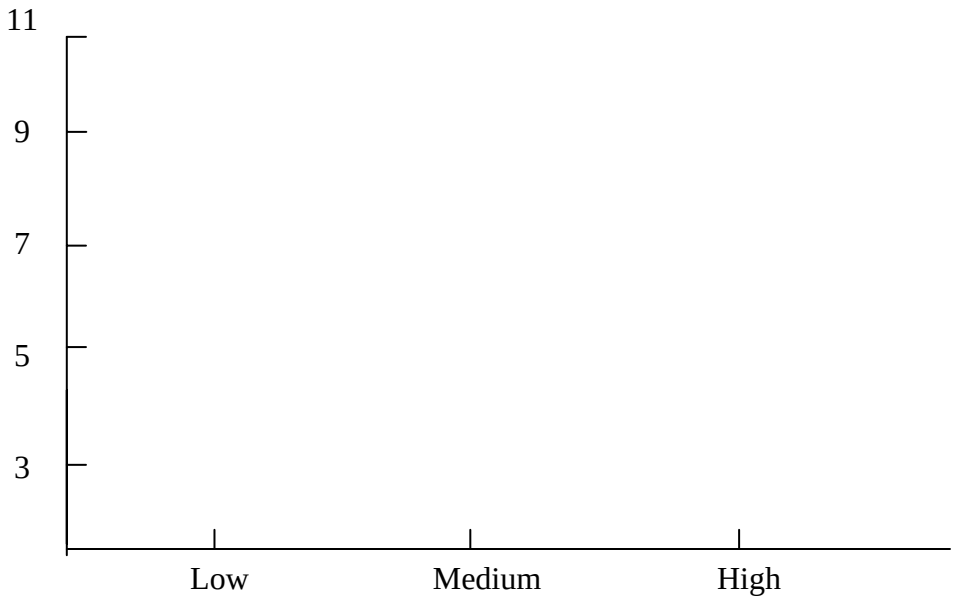
_____ AxB (Illumination x Reading Ability)

Continued ------>

Factorial Designs II (continued)

1. Calculate and label the overall means for the significant main effect(s).

2. Describe the main effect in words:



Graph the interaction below:

Describe the interaction in words: