

1. Each of you has a student ID number. What scale of measurement best describes the variable student ID number? (2 points)- DON'T THINK TOO HARD

- a) Nominal
- b) Ordinal
- c) Interval
- d) Ratio

2. For a hypothesis test, the p -value describes the following: (2 points)

- a) the probability of making a type I Error
- b) the probability that the research hypothesis is correct
- c) the probability of finding the sample results assuming the null is true
- d) the probability that a replication of the present study would find the same result

3. There are four elements of the statistical Power system. One of these is Power, what are the other three? Explain how changes in each of the three elements affect statistical Power. For example, as (*insert element*) increases, power also increases. (5 points)

4. In a journal article, the authors show a statistically significant difference between an intervention group and a control group with $p = .02$. The p-value in this statement is (2 points)

- the probability of finding the current results assuming the null is true
- the probability that the research hypothesis was correct
- the probability of replicating the results in another study
- the probability that the null hypothesis is correct

5. The Type I error in hypothesis testing occurs when (2 points)

- we reject a false null hypothesis
- we fail to reject a false null hypothesis
- we reject a true null hypothesis
- we fail to reject a true null hypothesis

6. The table shows a Verbal Reasoning test score, x , and an English test score, y , for a sample of 8 children.

Child	A	B	C	D	E	F	G	H
x	112	113	110	113	112	114	109	113
y	69	65	75	70	70	75	68	76

a) Calculate the mean and standard deviation for each variable. (5 points)

b) Create a scatter plot by hand (graph paper provided on the last page). From the scatterplot how would you describe the relationship between Verbal Reasoning test scores and English test scores? (5 points)

c) Calculate the correlation coefficient by hand. (5 points)

d) From the number you calculated in b) can you determine if the correlation is statistically significant? Why or why not? (5 points)

e) Conduct a null hypothesis statistical test to determine if the correlation is statistically significant. Use 2 as your critical t-value. (5 points)

f) Interpret your findings. What can you conclude about Verbal Reasoning test scores and English test scores. (5 points)

7. In simple regression (i.e., regression with only one *IV*) we use a *Line of Best Fit* or *Regression Line* to describe the relationship between *X* and *Y*. It's possible to draw an infinite number of lines through the scatterplot, in what sense is the regression line the 'Best' line? (5 points)

Use the coding table below to answer the following questions.

College Major	Code Variables		
	College ₁	College ₂	College ₃
Biology	0	0	0
Chemistry	1	0	0
Geology	0	1	0
History	0	0	1

8. The coding system used in the above table is: (2 points)

- dummy coding
- effects coding
- weighted effects coding
- contrast coding

9. A researcher is interested in examining the relationship between income (X) and a happiness score (Y). Using the following descriptive statistics calculate the regression line and answer the questions below. (10 points)

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Happiness (Y)	200	3.0	36.0	21.0	1.97520	3.901
Income (X)	200	.00	163.00	43.6600	28.16328	793.170
Valid N (listwise)	200					

	Income	Happiness
Pearson Correlation	1	.601**
income Sig. (2-tailed)		.000
N	200	200

** . Correlation is significant at the 0.01 level (2-tailed).

a) What is the slope? Explain this value with the current regression line.

b) Calculate the intercept. What does this value represent?

10. The attached page of SPSS output is from an analysis in which parents' perceptions of their children's daily school activities (Do school activities help their child learn?) were predicted by *Mom Stays at Home* (0 = No; 1 = Yes), *Parental Involvement at School* (a continuous variable with 0 = no involvement and 12 = high involvement), and *child perception of school* (a continuous variable with 1 = unfavorable and 6 = favorable). Use the attached output to answer the following questions: (20 points)

a) Report and interpret the Unstandardized Coefficient for *Mom Stays at Home*.

b) Is the coefficient for *Mom Stays at Home* statistically significant? How do you know?

c) What should the researcher conclude about *child perception of school*? Explain your answer.

d) What is the null hypothesis for the overall model (use words, not symbols)?

e) What does it mean to reject the null hypothesis?

f) Of the three predictors, which is the most important for predicting *parents' perceptions*? What information did you use to make this determination?

g) What *parental perception* score would you predict for a child whose *mom works*, has an *involvement* score of 7, and a *child's perception* score of 6? Show your work

h) Using the ANOVA source table calculate R^2 ?

i) Provide an interpretation of R^2 ?

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	29177.057	3	9725.686	44.071	.000 ^b
Residual	249149.572	1129	220.682		
Total	278326.628	1132			

a. Dependent Variable: Parent perception

b. Predictors: (Constant), Child perception, School Involvement, Mom Stays at Home

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	51.868	3.883			
Mom Stays at Home	2.518	.956	.079	2.63	.06
School Involvement	3.136	.361	.259	8.63	.02
Child perception	-.248	.068	-.103	3.64	.04

a. Dependent Variable: Parent perception

b.

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