

What you need to know for the final exam

What does it mean to:

- estimate a population parameter
- reject the null hypothesis
- test a theory empirically
- test the significance of a difference
- say a difference is not statistically significant
- say one variable is independent of another
- say " $p < 0.05$ "
- operationalize a concept
- fail to reject the null hypothesis

What is the difference between:

- descriptive, exploratory, and explanatory research
- conceptual definitions and operational definitions
- research questions and hypotheses
- hypotheses and theories
- inductive and deductive theory construction
- parsimonious and perspicuous
- ambiguous and vague
- empirical and theoretical
- variables and constructs
- independent variable and dependent variable
- reliability and validity
- discrete and continuous variables
- probability and non-probability sampling
- stratified sampling and cluster sampling
- simple random sampling and systematic sampling
- statistics and parameters
- descriptive statistics and inferential statistics
- null hypothesis and alternate hypothesis
- medians and means
- variance and sum of squares
- variance and standard deviation
- computational form and regular form

- z-scores and deviation scores
- random errors and biased errors
- row percentages and column percentages
- covariance and correlation
- direct vs. inverse; positive vs. negative relationship

What is the relation between:

- variables and constructs
- hypotheses and theories
- level of scaling and measure of central tendency
- level of scaling and measure of dispersion
- level of scaling and test of significance
- level of scaling and continuous/discrete
- null and alternate hypotheses
- biased errors and validity
- variables, constructs, hypotheses, and theories
- sampling variability and statistical significance
- z-score and the mean
- sample size and standard error of the mean
- sample size and the amount of sampling variability

What is:

- reality isomorphism
- inverted u-shaped curve
- stratified sampling
- external validity
- dispersion
- variance
- research question
- conceptual definition
- sampling variability
- a standard error
- a critical ratio
- systematic sample with random start
- error variance
- standard error of the mean
- statistical significance

- sampling distribution
- quota sample
- stratified sampling
- simple random sample
- a circular definition
- percentage down compare across
- a statistically significant difference
- the assumption behind expected values in chi-square

What are:

- units of analysis
- deviation scores
- “the marginals”
- standard scores
- representative samples
- degrees of freedom
- probability sampling methods
- essential qualities
- estimates of population parameters
- “the expecteds”

What is the purpose of confidence estimates/intervals?

Under what conditions is it appropriate to do a confidence estimate?

What is the purpose of the z-test of a single mean?

Under what conditions is it appropriate to do a z-test of a single mean?

What is the purpose of a z-test of the difference between means?

Under what conditions is it appropriate to do a z-test of the difference between means?

What is the purpose of a t-test of the difference between means?

Under what conditions is it appropriate to do a t-test of the difference between means?

What is the difference between correlation and covariance?

What are the two things you can do with correlation that you cannot do with covariance?

What is the purpose of the chi-squared test?

Under what conditions is it appropriate to do a chi-squared test?

What reduces sampling error?

In the chi-square test, how do you calculate expecteds?

In the chi-square test, how do you calculate degrees of freedom?

In the chi-square test, how do you calculate a cell's contribution to chi-squared?

In the chi-square test, how do you determine the critical value of chi-squared?

What are critical ratios?

How do you calculate critical ratios?

What do you do with critical ratios?

Under what conditions is statistical significance an issue?

What happens to the standard error of the mean if you double the sample size?

What happens to the standard error of the mean if you triple the sample size?

What happens to the standard error of the mean if you quadruple the sample size?

What two things are reduced when you use the computational form of an equation instead of the original one?

What is the critical value of Z for a two-tailed test at 99%?

What is the critical value of Z for a two-tailed test at 95%?

What is the critical value of Z for a one-tailed test at 95%?

What percent of the values in a normal distribution are within 1.0 standard deviation of the mean?

What percent of the values in a normal distribution are within 1.96 standard deviations of the mean?

What percent of the values in a normal distribution are within 2.58 standard deviations of the mean?

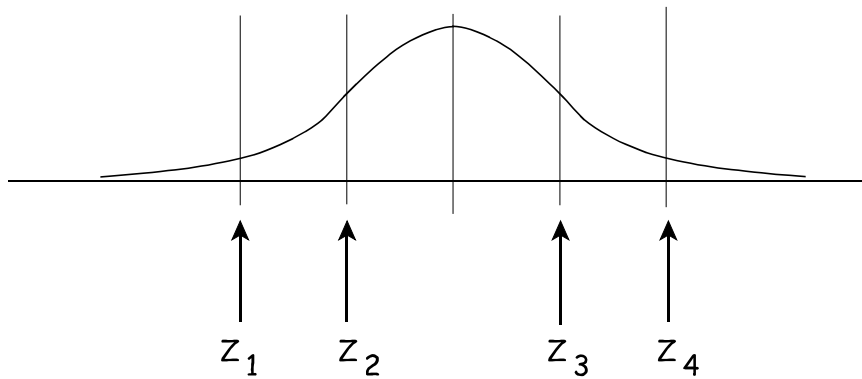
In the following **two** drawings, there are five **equally-spaced** vertical lines that divide the curve into six pieces. (The lines above Z_2 and Z_3 are the ones that appear on drawings of the normal curve that you have seen in exams in this course.)

In the drawing below, what is the value of Z_1 ?

In the drawing below, what is the value of Z_2 ?

In the drawing below, what is the value of Z_3 ?

In the drawing below, what is the value of Z_4 ?



In the drawing below, how much of the area is under the part of the curve labeled “A”?

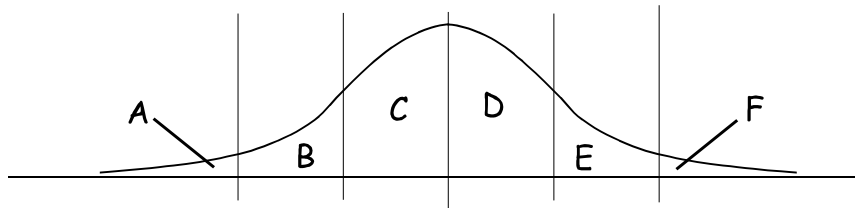
In the drawing below, how much of the area is under the part of the curve labeled “B”?

In the drawing below, how much of the area is under the part of the curve labeled “C”?

In the drawing below, how much of the area is under the part of the curve labeled “D”?

In the drawing below, how much of the area is under the part of the curve labeled “E”?

In the drawing below, how much of the area is under the part of the curve labeled “F”?



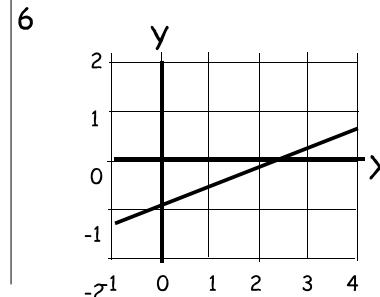
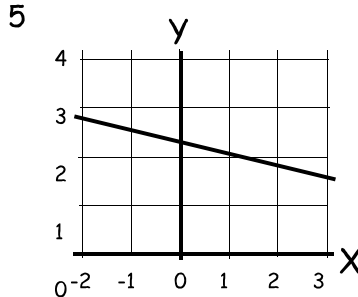
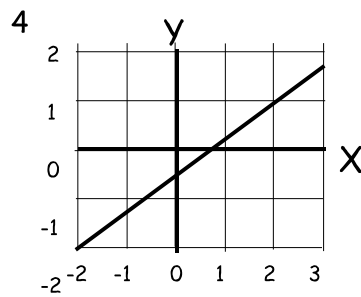
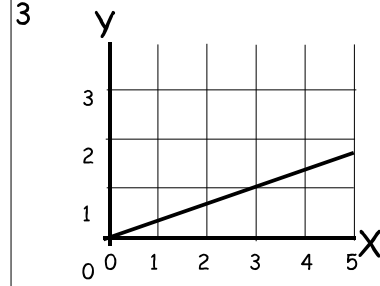
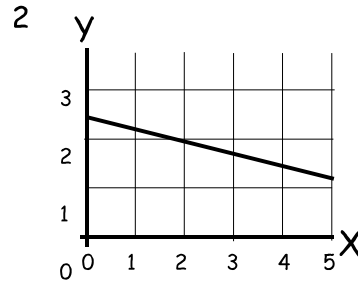
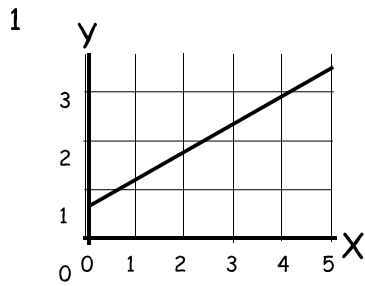
In the drawing above, how much of the area under the curve is in sections E and F combined?

In the drawing above, how much of the area under the curve is in sections A and F combined?

In the drawing above, how much of the area under the curve is in sections B and E combined?

In the drawing above, how much of the area under the curve is in sections B, C, and D combined?

Below is a drawing showing 6 regression plots.



What is the intercept of plot #1?
Circle it on the plot.

What is the intercept of plot #2?
Circle it on the plot.

What is the intercept of plot #3?
Circle it on the plot.

What is the intercept of plot #4?
Circle it on the plot.

What is the intercept of plot #5?
Circle it on the plot.

What is the intercept of plot #6?
Circle it on the plot.

How did you identify the intercepts? What was the first thing you looked for on the plots?

In words that do not involve any numbers, equations, or words like “zero” and “mean,” what is the intercept on a regression plot?