

AP Statistics

Semester 1 Exam

1/20/2015 from 0740-0910

The Semester 1 Exam may contain questions on the following topics:

(Note: There are topics listed below that are not on the test. Additionally, there may be topics on the test that are not listed below).

Part 1: Exploring and Understanding Data

- How to graph box plots and outliers
- How to calculate weighted means (mean of a group made of multiple sub-groups that aren't the same size)
- Means, medians, quartiles for skewed data
- Characteristics of skewed, symmetric, normal, uniform, bimodal, etc. data
- Shifting and Rescaling and the effect on mean, median, standard deviation, IQR, Range, z scores, etc.
- Finding the standard deviation from a graph
- How and when to use the Empirical Rule
- Comparing using z-scores
- Finding probabilities using the Normal Model

Part 3: Gathering Data

- Designing a simulation
- Identifying the "variable of interest" and "parameter of interest" from a study
- Characteristics of different sampling methods (SRS, Stratified, Cluster, Systematic)
- The differences between observational studies and experiments
- Designing a study to avoid bias
- How to design a good experiment (control, randomization, replication, blocking, blinding, etc.)
- Lurking and confounding variables

Part 4: Randomness and Probability

- Probability questions involving The General Addition Rule, The General Multiplication Rule and conditional probability (including tree diagrams)
- Constructing a probability model (table)
- Calculating expected value
- Independence and mutually exclusive
- Standard deviation from two random variables ("Pythagorean Theorem of Statistics")
- Binomial and Geometric Probability Models (formulas, answering probability questions and understanding the graphs of these models)

Part 5: From Data at Hand to the World at Large

- The Central Limit Theorem
- Sampling error
- The standard deviations of sampling distributions (for proportions and means)
- Sampling distributions (for proportions and means)
- Calculating a confidence interval for a proportion or the difference between two proportions (checking conditions, formula and the interval).
- Calculating a sample size for a given margin of error
- Performing a hypothesis test for a proportion or the difference between two proportions (hypotheses, alpha level, check conditions, state what test you are doing, calculate p-value, conclusion in context).
- Describing a p-value
- How to increase the power of a test.
- The difference between one tailed and two tailed tests.
- Alpha levels, Effect size, power
- Identifying if a Type I or Type II error is possible and what that error would be.

Recommendations for preparing for your semester exam:

- Review the above topics from your notes and from the textbook. Write down or type summaries of each of these topics.
- During class complete the review questions without using your notes or textbook. Make notes on a piece of paper of concepts that you need to review.
- Complete the assigned practice tests alone without using your notes or textbook
- Correct the assigned practice tests using the answers provided online
- Review the concepts for the problems that you missed.
- Ask Mr. Lewis when you have specific questions (during seminar or after school on Thursdays or Fridays)