**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)