MATHEMATICS

Statistics

Grades 9-12		
1. Students solve probability problems with finite sample spaces using the addition, multiplication, and complementation rules for probability distributions, and understand the simplifications which arise with independent events.	2. Students know the definition of conditional probability, and use it to solve for probabilities in finite sample spaces.	3. Students demonstrate understanding of the notion of discrete random variables by using them to solve for the probabilities of outcomes, such as the probability of the occurrence of five or fewer heads in fourteen coin tosses.
4. Students demonstrate understanding of the standard distributions (normal, binomial [the exponential distribution is not on the AP syllabus]), and can use them to solve for events in problems where the distribution belongs to these families.	5. Students determine the mean and standard deviation of a normally distributed random variable.	6. Students know the definition of the mean of a discrete random variable, and can determine it for a particular discrete random variable.
7. Students know the definition of the variance of a discrete random variable, and can determine it for a particular discrete random variable.	8. Students organize and describe distributions of data using a number of different methods, including frequency tables, histograms, standard line and bar graphs, stem and leaf displays, scatter plots, and box and whisker plots.	9. Students find the line of best fit to a given distribution of data using least squares regression.
10. Students understand the notion of a continuous random variable, and can interpret the probability of the an outcome as the area of the region under the graph of the probability density function associated with the random variable.	SM11. Students know the Central Limit Theorem, and can use it to obtain approximations for probabilities in finite sample spaces problems whose probabilities are distributed binomially.	SM12. Students know the definitions of the mean, median, and mode of a distribution of real valued data, and can compute them in particular situations.

MATHEMATICS

Statistics

Grades 9-12		
SM13. Students compute the variance and standard deviation of a distribution of data.	**SM14. Students know the definition of the correlation coefficient of two variables, and are familiar with its properties.**	**SM15. Students are familiar with the notions of a statistic of a distribution of values, of the sampling distribution of a statistic, and of the variability of a statistic.**
SM16. Students know basic facts concerning the relation between the mean and standard deviation of a sampling distribution and the mean and standard deviation of the population distribution.	**SM17. Students determine confidence intervals for a simple random sample from a normal distribution of data, and determine the sample size required for a desired margin of error.**	**SM18. Students determine the *p*-value for a statistic for a simple random sample from a normal distribution.**
SM19. Students are familiar with the chi-square distribution and test, and understand its uses.	**SM20. Students apply the normal, Student's *t*, binomial, and chi-square distributions to hypothesis testing.**	**SM21. Students apply several of the above concepts in group research projects.**