Online Courses for High School Students
1-888-972-6237

Pre-Calculus/Trigonometry

Course Description:
Students learn counting methods, probability, descriptive statistics, graphs of data, the normal curve, statistical inference, and linear regression. Proficiency is measured through frequent online and offline assessments as well as asynchronous discussions. Problem-solving activities provide an opportunity for students to demonstrate their skills in real-world situations.

Prerequisites: Algebra 2
Course Length: One Semester
Required Text: Probability and Statistics: A Reference Guide and Problem Sets (Included within the course)
Materials List: Texas Instruments TI-84 Plus Graphics Calculator

Course Outline:
Unit 1: Representing Data Graphically
Students develop skills and instincts that will allow them to create clear, convincing presentations of any data set they encounter. They also learn to look at any data chart or plot with a critical, mathematical eye and point out trends and important features of the data. They work on an extended graphing exercise throughout the unit and prepare a presentation.
- Course Introduction
- Introduction: Representing Data Graphically
- Data and Variables
- Graphs of Categorical Data
- Two-Way Tables
- Line Plots
- Frequency Tables
- Histograms
- Stem-and-Leaf Plots
- Time Series Plots

Unit 2: Representing Data Numerically

Students work with real data from 55 national parks in the United States, learning how to represent an entire set of data by using single numbers that describe where the center of the distribution is located and how the data are spread.

- Introduction: Representing Data Numerically
- Measures of Center
- Box Plots
- Determining Quartiles
- Outliers
- Comparing Data Sets
- Measuring Spread
- Transforming Data Sets

Unit 3: Counting and Probability

Students learn mathematical formulas for counting large sets and determine the number of combinations and arrangements. They also learn basic probability and the difference between experimental and theoretical probability.

- Introduction: Counting and Probability
- Counting Methods
- Permutations
- Combinations
- Basic Probability
- Geometric Probability
- Mutually Exclusive Events
- Overlapping Events
- Independent and Dependent Events
- Experimental Probability

Unit 4: Random Variables and Distributions

Students begin to develop a keener understanding of descriptive statistics.

- Introduction: Random Variables and Distributions
- Creating Probability Distributions
- Interpreting Probability Distributions
- Expected Value
- Binomial Distributions
- Continuous Random Variables
- The Normal Distribution
- Standardizing Data
- Comparing Scores
- The Standard Normal Curve
- Finding Standard Scores

Unit 5: Sampling
Students begin to learn about sampling and how to apply statistical methods to valid samples.
- Introduction: Sampling
- Sample and Population
- Bias in Sampling
- Reducing Bias
- Statistics and Parameters
- Interval Estimates

Unit 6: Statistical Inference
Students learn how to put the power of statistics to work.
- Introduction: Statistical Inference
- The Central Limit Theorem
- Estimating Means
- Mean Differences
- Estimating Proportions
- Proportion Differences

Unit 7: Relationships Between Variables
Students learn how to identify and describe relationships between variables.
- Introduction: Relationships Between Variables
- Scatter Plots
- Association
- The Correlation Coefficient
- Fitting a Line to Data
- Least Squares Regression
- Regression Analysis
- Cautions in Statistics

Unit 8: Semester Review and Test
Students review what they have learned and take the semester exam.
- Semester Review
- Semester Test