STAFFORD COUNTY PUBLIC SCHOOLS

Curriculum Overview
Algebra III

Course Description:

 Algebra III with Trigonometry reviews and extends the concepts taught in Algebra II and Geometry in preparation for the SAT and Math Achievement tests. It includes topics on triangular and circular trigonometric functions, study of polynomials, exponential and logarithmic functions. Students who successfully complete this course may take Statistics/Probability with Discrete Topics or AP Statistics. There is no Standards of Learning test for this course.

Essential Skills/Processes:

 Algebra III with Trigonometry has its own language. The vocabulary and symbols are very important to a student's understanding of the mathematical concepts presented. Students will use mathematical skills, symbols, and vocabulary to read and communicate about Algebra III with Trigonometry.

 Trigonometry functions model periodic phenomena, such as those associated with alternating electrical current and the Dow Jones industrial average. The study of trigonometry includes trigonometric definitions, and graphing and solving trigonometric equations and inequalities within the context of applications. Students should be encouraged to make connections among right triangle ratios, circular functions, and trigonometric functions. Communication using the language of mathematics, logic of problem solving and mathematical procedures, and interpretation of results in context are essential skills for students.

 Teachers should help students make connections and build relationships among algebra, arithmetic, geometry, discrete mathematics, and probability and statistics. Connections should be made to other subject areas and fields of endeavor through applications. Using manipulatives, graphing calculators, and computer applications to develop concepts should help students develop and attach meaning to abstract ideas. Throughout the study of mathematics, students should be encouraged to talk about mathematics, use the language and symbols of mathematics, communicate, discuss problems and problem solving, and develop their competence and their confidence in themselves as mathematics students.

Essential Knowledge:

* Examine the format, organization, time constraints, scoring procedures, and math strategies used on the SAT.
* Review number theory and arithmetic operations including percent, prime numbers, ratio and proportion, logic reasoning, sets (union, intersection, elements), properties of integers (odd, even, etc.), divisibility, sequences and series (including exponential growth).
* Review the concepts from Algebra I and II including substitution and simplifying expressions, properties of exponents (including fractional and negative exponents), algebraic work problems, equations, inequalities, quadratic equations, rational and radical equations, equations of lines, absolute value, direct and inverse variation, qualitative behavior of algebraic functions.
* Review area and perimeter of polygons, area and circumference of circles, volume of box, cube and cylinder, Pythagorean theorem, special properties of isosceles, equilateral and right triangles, properties of parallel and perpendicular lines, coordinate geometry, slope, similarity, and transformations.
* Review data interpretation, statistics (mean, median, mode), and probability.
* Use the definitions of the six trigonometric functions to find the sine, cosine, tangent, cotangent, secant, and cosecant of an angle.
* Identify, create, and solve practical problems involving triangles. Techniques will include using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.
* Given the value of one trigonometric function, find the values of the other trigonometric functions.
   -circular function definitions will be connected with trigonometric function definitions.
   -properties of the unit circle and definitions of circular functions will be applied.

- Find the values of the trigonometric functions of special angles and their related angles as found in the unit circle without the aid of a calculating utility.
- Convert radians to degrees and vice versa.
- Given one of the six trigonometric functions in standard form
  (e.g., y = Asin (Bx + C) + D, where A, B, C, and D are real numbers)
  -state the domain and the range of the function;
  -determine the amplitude, period, phase shift, and vertical shirt;
  -sketch the graph of the function by using transformations for at least a one-period interval.
- Use the graphing calculator to investigate the effect of changing A, B, C, and D on the graph of a trigonometric function.
- Identify the domain and range of the inverse trigonometric functions and recognize their graph.
- Use a calculator to find the value of any trigonometric function and inverse trigonometric function.
- Verify basic trigonometric identities and make substitutions using the basic identities.
- Use the properties of logarithms and solve and graph logarithmic functions.
- Review arithmetic and geometric sequences and series. Introduce infinite sequences and series, limits, and summations.
- Use the properties of exponents and graph exponential functions.
- Use the properties of logarithms and graph logarithmic functions.
- Solve exponential and logarithmic equations.
- Review arithmetic and geometric sequences and series. Introduce infinite sequences and series, limits and summation.

Resources:
- Stafford County Public Schools: http://stafford.schoolfusion.us/ .
- High School Course Catalog: http://stafford.schoolfusion.us/ . Click on "For Parents/Students" tab.
- VA Mathematics Standards of Learning:
  http://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/review.shtml
- School Report Card (VA Department of Education):
  http://www.doe.virginia.gov/statistics_reports/school_report_card/index.shtml
- Pearson Prentice Hall:
  http://pearsonschool.com/index.cfm?locator=PSZu6t&filter_161=&filter_422=&filter_423=&filter_424=&filter_7=&filter_281=&filter_446=&filter_425=&programFilterTypeList=161%2C422%2C423%2C424%2C7%2C281%2C446%2C425&PMDbSiteid=2781&PMDbSolutionid=6724&PMDbSubSolutionid=&PMDbCategoryid=811&PMDbSubcategoryid=23495&&PMDbProgramID=62241