



GREAT NECK PUBLIC SCHOOLS

"Where Discovery Leads to Greatness"

#DiscoverGreatness

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Curriculum Profile: Algebra 2.2

<u>Department</u>	Mathematics	
<u>Course Name</u>	Algebra 2.2, Topics in Precalculus	
<u>Course Length</u>	1 Year	
<u>High School Credits</u>	1	
<u>Description</u>	Algebra 2 is designed for students who successfully completed Algebra 1 and Geometry. It is the third year in the NYS "Story of Functions" curriculum. The focus of this course is built on their work with linear, quadratic, and exponential functions in Algebra I, and extend their repertoire of functions to include polynomial, rational, radical, and trigonometric functions. Students work closely with the expressions that define the functions and continue to expand and hone their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers, and solving exponential equations using the properties of logarithms. Students see how the visual displays and summary statistics they learned in earlier grades relate to different types of data and to probability distributions. They identify different ways of collecting data, including sample surveys, observational studies, and experiments. Using simulation, randomization, and careful design, students make inferences, justify conclusions, and critique statistical claims. Students create theoretical and experimental probability models following the modeling cycle. They compute and interpret probabilities from those models for compound events, attending to mutually exclusive events, independent events, and conditional probability. The content from the NYS Algebra 2 curriculum will be covered in depth and with enrichment. This course is for students who completed Algebra 2.1 Topics. Students will study trigonometric functions and a unit on probability and statistics. Regents exam in January is required. Students will study selected pre-calculus topics in the second semester.	
<u>Target/eligible students</u>	Students who completed Algebra 2.1 in the year prior.	
<u>State Learning Standards Link(s)</u>	New York State Next Generation Mathematics Learning Standards	
<u>Primary texts and materials</u>	https://www.engageny.org	
	● Overview /Standards	
<u>Unit 1: Review of Trigonometric Functions*</u>	● All-F.TF.2 ● All-F.TF.4 ● All-F.TF.8	Students will complete a review of Trigonometric functions. Understanding of the six trigonometric ratios. Representing an angle drawn in standard position and approximating the six trigonometric values of an angle based on where the angle terminates. Understanding of reference angles and how two angles with the same reference angle compare to one another. Using the ratios in the 30-60-90 right triangle and the 45-45-90 to find the exact values of the six trigonometric functions whose reference angles are 30, 45 or 60 degrees. Finding the six trigonometric values of quadrantal angles. Understanding of radians as a real number representation of an angle measurement. Being able to convert between degrees and radians. Finding the exact values of the six trigonometric functions at angles expressed as radian measurements. Understanding of the unit circle and how it can be used to better understand basic trigonometry. Graphing sinusoidal

		functions after performing transformations on parent sine and cosine functions. Being able to write an equation of a sinusoidal function based on the graph of the function or given specific information about the function. Basic understanding of the graphs of the tangent, cosecant, secant and cotangent functions. Understanding of basic trigonometric identities and Pythagorean identities. Being able to use Pythagorean identities to find trigonometric values based on a given other trigonometric value. Verifying basic trigonometric identities and simplifying basic trigonometric expressions.
<u>Unit 2: Probability and Statistics</u>	● All-S.ID.4a ● All-S.ID.6a ● All-S.CP.7	Understanding of basic probability of an event. Reading and understanding two-way tables and Venn diagrams. Determining the probability of the conjunction of two events and the disjunction of two events. Understanding of conditional probability. Understanding and determining whether two events are independent of one another through mathematical justification. Understanding of the counting principle and how it applies to probability or multiple events. Basic understanding of binomial probability and Bernoulli trials. Modeling data distributions using dot plots, boxplots and histograms. Determining the center, shape and spread of data distributions. Using curves to model data distributions. Basic understanding of the normal distribution. Recognition of whether or not a normal curve is appropriate for a given data set and determining population percentages using a graphing calculator for an appropriate normal curve. Types of statistical studies. Making inferences and justifying conclusions from sample surveys, experiments and observational studies. Recognizing the purposes of and differences among the different statistical studies and explaining how randomization relates to each. Given a simulation model based on a sample proportion or mean and constructing an approximate 95% confidence interval centered on the statistic and determining if a suggested parameter is plausible. Using the tools of statistics to draw conclusions from numerical summaries. Using language of statistics to critique claims from informal texts. Summarizing, representing and interpreting data on two categorical and quantitative variables. Representing bivariate data on a scatter plot and describing how the variables are related. Fitting a function to real-world data and using this function to answer questions in the context of the data.
<u>Unit 3: Regents Review</u>		Students will complete review for the Regents examination in January.
<u>Unit 4: Sequences and Series</u>	● All-F.IF.3	Recognize that a sequence is a function whose domain is a subset of the integers. Write expressions using sigma notation. Derive the formula for the sum of an arithmetic and geometric series. Calculate partial sums. Determine whether a series is convergent or divergent.
<u>Unit 5: Vectors</u>	● (+)-N.VM	Write vectors in component form. Add vectors using the tip-to-tail and parallelogram methods. Finding the equilibrium vector given a contextual problem. Develop the law of sines and law of cosines. Solve for the ambiguous case. Derive and use the formula for the dot product. Find the angle between two vectors.
<u>Unit 6: Rational Functions</u>	● (+)-A.APR	Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions. Graph rational functions and identify key features.
<u>Unit 7: Limits</u>	● MP1 ● MP2	Identify limits graphically. Use limits to determine whether a function is continuous at a point. Use algebraic techniques to calculate limits. Work with limits in piecewise functions.
<u>Additional Notes</u>	Sequencing of topics may vary. Post-Regents examination, teacher will select appropriate topics from Precalculus to cover. *denotes that this unit may not be completed in its entirety and will be finished in the next course.	