Algebra 2 (High School Math)

Course Curriculum (MPSL Academy)

Each Session: 1 hour 15 minutes

(First 10 min review of last week topics/HW, 50 min new topics, 15 min critical thinking Qs)

1. Linear Functions

- Parent Functions and Transformations
- Transformations of Linear and Absolute Value Functions
- Modeling with Linear Functions
- Solving Linear Systems
- Word Problems

2. Quadratic Functions

- Transformations of Quadratic Functions
- Characteristics of Quadratic Functions
- Focus of a Parabola
- Modeling with Quadratic Equations
- Word Problems

3. Quadratic Equations and Complex Numbers

- Solving Quadratic Equations
- Complex Numbers
- Completing the Square
- Using the Quadratic Formula
- Solving Nonlinear Systems
- Quadratic Inequalities
- Word Problems

4. Polynomial Functions

- Graphing Polynomial Functions
- Adding, Subtracting, and Multiplying Polynomials
- Dividing Polynomials
- Factoring Polynomials
- Solving Polynomial Equations
- The Fundamental Theorem of Algebra
- Transformations of Polynomial Functions
- Analyzing Graphs of Polynomial Functions
- Modeling with Polynomial Functions

5. Rational Exponents and Radical Functions

- nth Roots and Rational Exponents
- Properties of Rational Exponents and Radicals
- Graphing Radical Functions
- Solving Radical Equations and Inequalities
- Performing Function Operations
- Inverse of a Function

6. Exponential and Logarithmic Functions

- Exponential Growth and Decay Functions
- The Natural Base e
- Logarithms and Logarithmic Functions
- Transformations of Exponential and Logarithmic Functions
- Properties of Logarithms
- Solving Exponential and Logarithmic Equations
- Modeling with Exponential and Logarithmic Functions

7. Rational Functions

- Inverse Variation
- Graphing Rational Functions
- Multiplying and Dividing Rational Expressions
- Adding and Subtracting Rational Expressions
- Solving Rational Equations

8. Sequences and Series

- Defining and Using Sequences and Series
- Analyzing Arithmetic Sequences and Series
- Analyzing Geometric Sequences and Series
- Finding Sums of Infinite Geometric Series
- Using Recursive Rules with Sequences

9. Trigonometric Ratios and Functions

- Right Triangle Trigonometry
- Angles and Radian Measure
- Trigonometric Functions of Any Angle
- Graphing Sine and Cosine Functions
- Graphing Other Trigonometric Functions
- Modeling with Trigonometric Functions
- Using Trigonometric Identities
- Using Sum and Difference Formulas

10. Probability

- Sample Spaces and Probability
- Independent and Dependent Events
- Two-Way Tables and Probability
- Probability of Disjoint and Overlapping Events

- Permutations and Combinations
- Binomial Distributions

11. Data Analysis and Statistics

- Using Normal Distributions
- Populations, Samples, and Hypotheses
- Collecting Data
- Experimental Design
- Making Inferences from Sample Surveys
- Making Inferences from Experiments

16. ADVANCE TOPICS

- VARIATIONS & INEQUALITIES
- ORDERED PAIRS
- LINES & LINEAR EQUATIONS
- GRAPHING SYSTEMS
- RADICAL & QUADRATIC EQUATIONS
- PLOTS, ANGLES & TRIANGLES
- RATIONAL EXPRESSIONS
- FACTORS, GCF – WORD PROBLEMS
- PERCENT & SOLVING EQUATIONS
- RELATIONS & FUNCTIONS

NOTE: STUDENTS WILL PARTICIPATE IN VARIOUS STATE & NATIONAL LEVEL MATH COMPETITIONS LIKE MATHCOUNTS, MATH OLYMPIAD, MATH KANGAROO, CONTINENTAL MATH LEAGUE AND SO ON. OUR GOAL IS TO BUILD CONFIDENCE IN MATH IN AN EFFICIENT WAY RESULTING IN IMPROVING SCORES IN SCHOOL EXAM & SUCCEED IN NATIONAL/INTERNATIONAL MATH COMPETITIONS.