Curriculum for the Math Problem Solving Class (Upper Class)
HuaXia Bergen Chinese School
2018- 2019 Academic Year

By Instructor: Marvin Yu

First class: Diagnostic Test (AMC 8 contest problems)
        This is for me to estimate the relative strengths and weaknesses of each individual student, and consequently adjust my lesson plans.

Unit 1: Algebra
Review of writing expressions and arithmetic properties
Solving linear equations (substitution, elimination)
Graphing linear equations, properties of lines
Solving quadratic equations (factoring, completing the square, Quadratic Equation)
Graphing quadratic equations, properties of parabolas
Functions and higher order polynomials
Exploration of other conic sections and their algebraic representations

Unit 2: Geometry
Classification of geometric figures
Properties of lines
Trigonometry:
        Properties and classification of triangles
        Similarity and congruence
        Right triangles (Pythagorean Theorem)
        Introduction to trigonometric functions
        Other useful formulas
Properties of circles and inscribed/circumscribed figures
Properties and classification of quadrilaterals
Algebraic approach to geometry (coordinate geometry)

Unit 3: Combinatorics/Number Theory
Probability
Counting Outcomes
Combinations and Permutations
Factoring numbers, GCD/LCM
Modular Arithmetic

Unit 4: Contest Application
In this unit, we will apply previously learned knowledge to contest problem solving.
A contest will be given one week, and the problems will be reviewed the next.