HIGHLAND PARK SENIOR HIGH
INTERNATIONAL BACCALAUREATE WORLD SCHOOL

Algebra 2
MYP Level 5
Instructors: McKay, Moreno, Schlukebier

I. Course Summary

This is a complete high school algebra 2 course that meets Minnesota Mathematic Standards. Successful completion of this course as well as prior courses should have students prepared for the MCA. The course incorporates the MYP fundamental concepts of holistic learning, intercultural awareness and communications, by making connections between mathematics and other subjects. The cultural aspects are shown in that mathematics is embedded in all cultures. Finally, students are expected to be able to show what they know if a variety of manners. The IB learner profile is used as a guide in developing and implementing the curriculum. Being a mathematics course, an emphasis is placed on developing inquirers and thinkers while trying to have students reflect upon what they have learned.

II. Units of Study/State Standards/MYP Aims and Objectives

Units of study:
Unit 1: Linear Functions and Systems
Unit 2: Quadratic Functions and Equations
Unit 3: Polynomial Functions
Unit 4: Rational Functions
Unit 5: Rational Exponents and Radical Functions
Unit 6: Exponential and Logarithmic Functions
Unit 7: Data Analysis and Statistics
Unit 8: Probability
Unit 9: Trigonometric Functions
Unit 10: Trigonometric Equations and Identities (If time)
Unit 11: Conic Sections (If time)
Unit 12: Matrices (If time)

The aims of teaching and learning mathematics includes encouraging students to:
1) Appreciate the usefulness and power of mathematics
2) Enjoy math and develop perseverance
3) Be able to communicate using mathematical notation
4) Develop knowledge, and thinking skills
5) Recognize the presence of mathematics in their lives

Over the course of the year students will achieve the objectives of:
1) Acquiring knowledge and understanding
2) Be able to recognize and investigate patterns
3) Communicate effectively using mathematical language and notation
4) Reflect upon their work and conclusions.

III. Standards and IB MYP Aims

Standard 9.2.1: Understand the concept of function, and identify important features of functions and other relations using symbolic and graphical methods where appropriate.

9.2.1.7: Understand the concept of an asymptote and identify asymptotes for exponential functions and reciprocals of linear functions, using symbolic and graphical methods.

Standard 9.2.2: Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context.
9.2.2.4: Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively.
9.2.2.6: Sketch the graphs of common non-linear functions

Standard 9.2.3: Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.
9.2.3.1: Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at points in their domains.
9.2.3.4: Add, subtract, multiply, divide and simplify algebraic fractions.

Standard 9.2.4: Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential and n^{th} root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.
9.2.4.1: Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.
9.2.4.5: Solve linear programming problems in two variables using graphical methods.
9.2.4.6: Represent relationships in various contexts using absolute value inequalities in two variables; solve them graphically.
9.2.4.7: Solve equations that contain radical expressions. Recognize that extraneous solutions may arise when using symbolic methods.

Standard 9.4.1: Display and analyze data; use various measures associated with data to draw conclusions, identify trends and describe relationships.
9.4.1.1: Describe a data set using data displays, such as box-and-whisker plots; describe and compare data sets using summary statistics, including measures of center, location and spread. Measures of center and location include mean, median, quartile and percentile. *Measures of spread include standard deviation,* range and inter-quartile range. *Know how to use calculators, spreadsheets or other technology to display data and calculate summary statistics.*
9.4.1.3: Use scatter plots to analyze patterns and describe relationships between two variables. Using technology, determine regression lines (line of best fit) and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions.

Standard 9.4.3: Calculate probabilities and apply probability concepts to real-world and mathematical problems.
9.4.3.2: Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.
9.4.3.7: Understand and use simple probability formulas involving intersections, unions and complements of events.
9.4.3.9: Use the relationship between conditional probabilities and relative frequencies in contingency tables.

IV. Text/Resources/ Supplies

1. Savvas Envision Algebra 2 (On-line textbook)
2. District issued i-pad
3. Folder, notebook and a pen/pencil.
4. A scientific calculator is strongly recommended.

V. Methodology

In MYP, teachers work collaboratively to develop a variety of techniques, focusing on approaches to learning, especially critical thinking and reflection. Students take responsibility for their learning through individual and group work, addressing unit and guiding questions, expanding on their critical thinking skills/problem solving skills, and building on their self-advocacy.

VI. Methods of Assessment

The use of both formative and summative assessments will be used to gauge and guide student success. Formative assessments will be routine, informative and ongoing. Among other strategies teachers may choose to use exit cards, math review, visual checks for understanding (thumbs up, note cards, etc.), quick writes, discussion, or practice problems. Quizzes within a unit might also be used to evaluate student progress and adjust instruction. Summative assessments will commonly take the form of chapter tests, unit tests, and/or group or individual projects. Cumulative final exams may also be given.

VII. Grading and Reporting

Grades will be given at the conclusion of each quarter with 1 progress grade given over the course of the semester. Grades will consist of 80% summative assessments and 20% formative assessments, as stated by the Highland Park Senior High Grading Policy. The assessments will be based upon the aforementioned objectives and will include the MYP assessment criteria.
A: Knowledge and understanding
B: Investigating patterns
C: Communications in mathematics
D: Reflection in mathematics

VIII. Other course information

Students will be expected to adhere to the following classroom principles:

1. Respectful – I will demonstrate respect for myself, others, school, and the community
2. Responsible – I will be a responsible member of my school community
3. Safe – I will help create a school environment where every student feels safe

All Highland Park school and district policies dealing with absences, tardiness, late work, technology (including cell phone usage), and other issues will be adhered to. Additional details can be found on the school's website. Most course information will be found on the Schoology page for the course.

I am available for help most days before or after school, I can be most easily reached via e-mail at Michael.mckay@spps.org. You can also try my phone line at (651)-744-3868. For the status of assignment completion and class grades please use the Campus Portal and/or Schoology.